**Robo Advisor – System and Documentation Report**

* 1. Details of portfolio construction:   
     this is my philosophy, and my rebalancing, what is our fee,

Stress testing. Scenarios… preprocessing…

* 1. Risk model: distributions that I assume, …

Back testing

* 1. Risk Analytics: document what are the formula, … How you organize the system
  2. System Doc
  3. Data:

Back testing- validation

Investment universe: We select our universe of instruments in equities, ETFs (representing fixed income, commodities with a lower fees), and options (mainly S&P500 and Dow Jones Industry Average Index), with market spread across US, UK(GBP), Europe(EUR), China(HK), and Australia(AUS). We believe by exposing to these markets, we are able to benefit from diversification.

Security Selection: (Sylvie)

Rebalancing method:

Portfolio Construction: In order to form portfolios for three levels of risk exposure, we follow the typical industry standard by moving our asset allocation on the efficient frontier. We have three portfolios: Value(90% fixed income, 5% equity, 5% others), Balance(50% fixed income, 50% equity), and Growth(10% fixed income, 90% equity).

Our fee: 0.1% (or whatever)

Risk Model:

We select risk factors based on our portfolio, where we mainly focus on the fundamental risk factors, Fama-French 5 factors plus 20 fixed income or industry specific factors. We back tested our risk factors model using ……

**Scenarios and simulation (risk factors):**

Our scenario tests are based on the results from the Paper “Regress Under Stress: A Simple Least-Squares Method for Integrating Economic Scenarios with Risk Simulations” by Dan Rosen and David Saunders[[1]](#footnote-1). We have a global economic outlook scenario as described in the table below. We divided our portfolio into two sub-portfolios, one only involves the US market and the other. As a result, we split our scenario tests into two parts, each part focus on portfolios in one market.

**Global market scenario:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Global Scenario | US | CAN | EURO | UK | JPN |
| Real GDP | 2.1% | 1.7% | 2.8% | 1.3% | 0.75% |
| Inflation | 0.8% |  |  |  |  |
| FX | - |  |  |  |  |
| IR Short | 2.0% |  |  |  |  |
| IR Long | 3.5% |  |  |  |  |

**US market scenario test**

Since the instruments involved in our US portfolio all come from the US market, we only focus on macro-economic factors in the US market with a time horizon of one year (2019.07-2020.). The macro-economic factors we include in all U.S Scenarios are Real GDP (% change), Inflation (% change), Unemployment (%), Short-term Interest Rate, Long-term Interest Rate, S&P 500 growth (%) and Oil price one year ahead. We generate three scenarios based on research reports on U.S economy growth forecasts and the anticipated growth is presented in the table below:

(By 2019.06)

|  |  |  |  |
| --- | --- | --- | --- |
| US Scenario | UP | Base | Down |
| Real GDP | 3.2% | 2.3% | 1.4% |
| Inflation | 1.75% | 2.15% | 2.35% |
| Unemployment | 3.45% | 3.95% | 4.25% |
| IR Short | 2.90% | 2.75% | 2.4% |
| IR Long | 3.55% | 3.50% | 3.30% |
| S&P 500 | 19.21% | 11.2% | 5.26% |
| Oil ($/bbl, WTI) | 61 | 59.5 | 52 |

Plot

Correlation …

Risk measures and statistics:

We compute VaR and CVaR (Expected Shortfall)

1. Regress Under Stress: A Simple Least-Squares Method for Integrating Economic Scenarios with Risk Simulations, Dan Rosen, David Saunders, Autumn 2016, the Journal of Risk Management in Financial Institutions [↑](#footnote-ref-1)