

Risk Analyzer

Problem Statement: Build a risk analysis tool that someone would use when considering how to manage and invest their money. When people have money to invest, they will want to know – should I put this money into an investment that might be less risky but have a lower return, or would I rather have it in an investment that is higher risk, but higher reward?

The type of investment, along with other factors, will determine risk level. Your job is to create a tool that takes macroeconomic factors into consideration, specifically for investors in the United States.

Portfolio elements that we expect to see in the Project:

- **Interest rates:** For cash instruments, such as a savings account, the risk is low, and banks pay interest rates to customers who store their money there.
- **Treasury bonds:** Instead of storing your money at the bank, with a treasury bond, you are lending directly to the US Government, which is unlikely to default on its debt.
- **Stock market:** The stock market tends to be higher risk, depending on which stocks you select, but over time can provide a higher reward. The market price of stocks is determined by many factors that buyers and sellers consider before placing trades – including company financial statements, unemployment rate, inflation, and consumer behavior, to name a few.

You could base your analysis on various risk factors that you deem appropriate. Some examples below:

- **Unemployment:** Unemployment is an indicator of the health of economy. It can be used forecast returns on investment to certain degree. The more people are unemployed, the less demand there will be for a company's goods and services, impacting its stock prices. Investors like to invest in companies in profitable businesses within stable economies, so their investing activity drops off when indicators (such as unemployment) show threats to profitability.
- **Government spending and regulations:** Government spending can spur economic growth fostering an environment to grow investor money. Government can also impose sanctions and regulations to curtail dubious financial practices or impose fines on firms thus impacting their financial performance and stock price.
- **More as you see fit**

Assume that someone has a portfolio that is currently 25% savings, 25% treasury bonds, and 50% stocks. Build a model that will estimate the relative risk related to this portfolio, potentially including (but not limited to) the examples above. You must add one additional risk factor to the ones listed above. How might someone use this model to determine what their investment mix should be to meet their financial goals?

Reference Materials

Portfolio Risk:

[Understanding Investment Portfolio Risk Management • Riverbend IM \(riverbendinvestments.com\)](#)
[Portfolio Management Definition \(investopedia.com\)](#)

Dataset Glossary

<https://guides.lib.uconn.edu/frm/datasets>

Portfolio Analysis API

[AWS Marketplace: Portfolio Analysis API \(amazon.com\)](#)

Here are a few sample data sets, you will need to augment further with your own research

Data Sets and API

Data/APIs:

<http://www.columbia.edu/~tmd2142/best-6-stock-market-apis-for-2020.html>

Treasury API:

<https://fiscaldata.treasury.gov/api-documentation/#list-of-endpoints>

Labor Census

[Labor Force Statistics Datasets \(census.gov\)](#)

Kaggle

[Predicting Risk/Return on Financial Investment | Kaggle](#)
[Portfolio-Risk-and-Return | Kaggle](#)

AWS

[AWS Marketplace: 20 Years of End-of-Day Stock Data for Top 10 US Companies by Market Cap \(amazon.com\)](#)

US Treasury Security

[Average Interest Rates on U.S. Treasury Securities | U.S. Treasury Fiscal Data](#)

Important Information to Note:

Are we limited to using the risk factors listed above?

No, every team should research on available risk factors and must include attest 1 other risk factor that is not listed above.

Are we limited to using the suggested Data sets?

No, the list of data sets and API above are just a starting point. Teams must research and explore other publicly available datasets to perform risk analysis.

Can GS Provide trail license for any of the data vendors?

No, GS will not be providing any test API keys/trail licenses for building your project. Individual teams should be sourcing datasets/API's that are publicly available.