VEURX vs VFINX Notes

* Funds
  + **VEURX**
    - **Summary**: This index fund provides investors low-cost exposure to the European stock markets. The fund holds more than 1,200 stocks across the European region, which makes up roughly half of the non-U.S. equity marketplace. In addition to stock market risk, the fund is also subject to currency risk and may have a higher degree of country risk than other international funds, since it invests solely in stocks of European countries. Long-term investors seeking exposure to European equities may wish to consider this fund as part of a diversified portfolio.
    - **Portfolio**: Vanguard European Stock Index Fund seeks to track the performance of a benchmark index that measures the investment return of stocks issued by companies located in the major markets of Europe.
  + **VFINX**
    - **Summary**: As the industry’s first index fund for individual investors, the 500 Index Fund is a low-cost way to gain diversified exposure to the U.S. equity market. The fund offers exposure to 500 of the largest U.S. companies, which span many different industries and account for about three-fourths of the U.S. stock market’s value. The key risk for the fund is the volatility that comes with its full exposure to the stock market. Because the 500 Index Fund is broadly diversified within the large-capitalization market, it may be considered a core equity holding in a portfolio.
    - **Portfolio**: Vanguard 500 Index Fund seeks to track the performance of a benchmark index that measures the investment return of large-capitalization stocks.
* Statement of the Problem
  + **Problem**: ?
  + **Equations used:** 
    - **Monthly Risk-Free Geometric Return**: theoretical rate of return of an investment with no risk. The risk-free rate is the interest an investor would anticipate from a risk-free investment over a specified period of time. This is a theoretical number because every investment carries some risk.
      * Ln(1+r/1200)
      * r = rate at the end of the month
    - **Monthly Total Return**: the investment return received each month.
      * Ln(adjclose2/adjclose1)
      * Adjclose2 = adjusted close of current month
      * Adjclose1 = adjusted close of previous month
    - **Equity Premium**: the difference between the return on a stock and the return on a bond.
      * (Monthly Total Return) – (Monthly Risk-Free Return)
      * P(t) for VEURX
      * P\_0(t) for VFINX
* Source of Data
  + Risk-Free Rate: <https://fred.stlouisfed.org/series/DGS3MO>
  + VEURX: <https://finance.yahoo.com/quote/VEURX>
  + VFINX: <https://finance.yahoo.com/quote/VFINX>
* Github