



# Final Project

Econ 424A, Summer 2015

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THIS PROJECT ANALYZES 5 YEARS OF MONTHLY CLOSING PRICE  
DATA FROM THE END OF JUNE 2010 THROUGH THE END OF JUNE  
2010.

# Table of Contents

1. Executive Summary
2. Return Calculations and Sample Statistics
3. Value at Risk Calculations
4. Rolling Analysis of the CER Model Parameters
5. Portfolio Theory
6. Asset Allocation

## 0. EXECUTIVE SUMMARY

### a) Data Set

This project analyzes 5 years of monthly closing price data from the end of June 2010 through the end of June 2010.

### b) Mutual Funds Descriptions

#### **S & P 500 index: vfinx**

The investment seeks to track the performance of a benchmark index that measures the investment return of large-capitalization stocks. The fund employs an indexing investment approach designed to track the performance of the Standard & Poor 500 Index, a widely recognized benchmark of U.S. stock market performance that is dominated by the stocks of large U.S. companies.

#### **European stock index: veurx**

The investment 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. The fund employs an indexing investment approach by investing all, or substantially all, of its assets in the common stocks included in the FTSE Developed Europe Index. The index is made up of approximately 521 common stocks of companies located in 16 European countries-mostly companies in the United Kingdom, Switzerland, France, and Germany.

#### **Emerging markets funds: veidx**

The investment seeks to track the performance of a benchmark index that measures the investment return of stocks issued by companies located in emerging market countries. The fund employs an indexing investment approach by investing substantially all (approximately 95%) of its assets in the common stocks included in the FTSE Emerging Index, while employing a form of sampling intended to reduce risk. The FTSE Emerging Index includes approximately 907 common stocks of companies located in emerging markets around the world.

#### **Long-term bond fund: vbltx**

The investment seeks to track the performance of a market-weighted bond index with a long-term dollar-weighted average maturity. The fund employs an indexing investment approach designed to track the performance of the Barclays U.S. Long Government/Credit Float Adjusted Index. This index includes all medium and larger

issues of U.S. government, investment-grade corporate, and investment-grade international dollar-denominated bonds that have maturities of greater than 10 years and are publicly issued. All of the fund & investments will be selected through the sampling process, and at least 80% of the fund's assets will be invested in bonds held in the index.

**Short-term bond fund: vbisx**

The investment seeks to track the performance of a market-weighted bond index with a short-term dollar-weighted average maturity. The fund employs an indexing investment approach designed to track the performance of the Barclays U.S. 1-5 Year Government/Credit Float Adjusted Index. This index includes all medium and larger issues of U.S. government, investment-grade corporate, and investment-grade international dollar-denominated bonds that have maturities between 1 and 5 years and are publicly issued. All of the fund & investments will be selected through the sampling process, and at least 80% of the fund's assets will be invested in bonds held in the index.

**Pacific stock index: vpacx**

The investment 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 the Pacific region. The fund employs an indexing investment approach by investing all, or substantially all, of its assets in the common stocks included in the FTSE Developed Asia Pacific Index. The FTSE Developed Asia Pacific Index consists of approximately 829 common stocks of companies located in Japan, Australia, South Korea, Hong Kong, Singapore, and New Zealand.

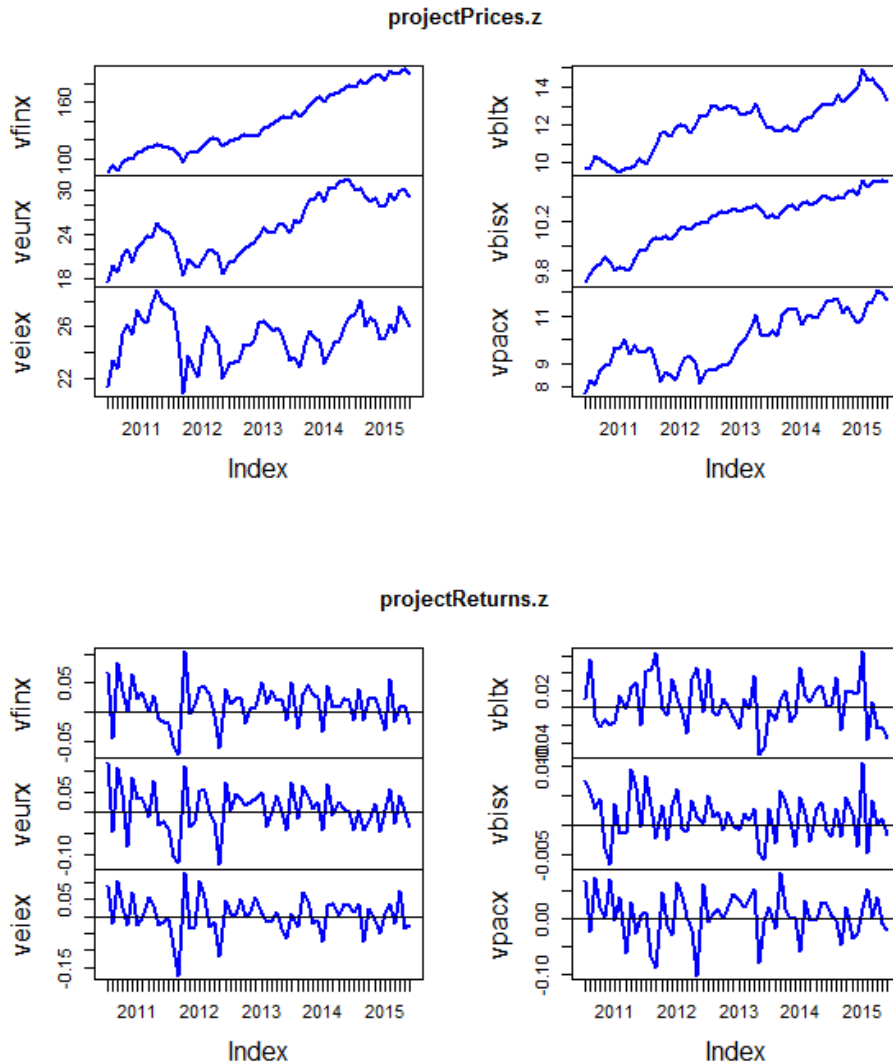
c) Main findings

- The mutual funds of country stock indexes all had prices and returns dropped dramatically at the end of 2011 because of the influence of the European sovereign debt crisis.
- Six mutual funds have returns that are normally distributed. Emerging market fund veix look least normally distributed because the absolute value of its skewness and excess kurtosis is the largest. Short-term bond fund vbisx is the most normally distributed one.
- Rolling analysis suggests that expected returns and standard deviations are not stationary.

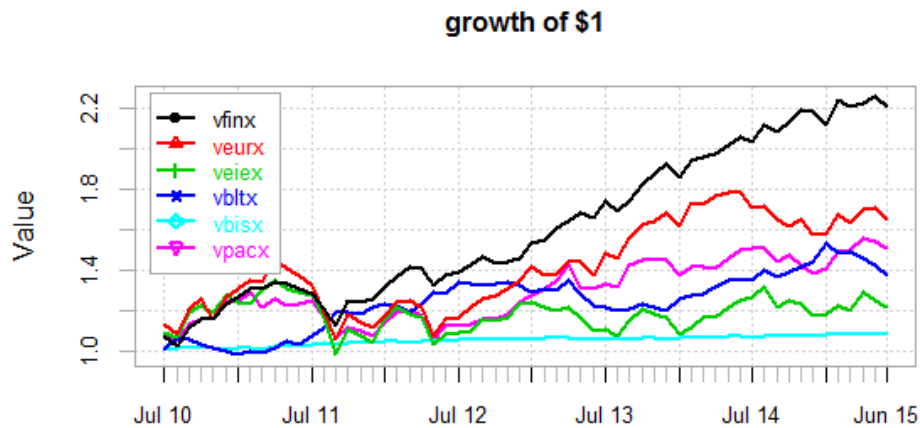
- S&P 500 vfinx has the highest return and Short-term bond fund vbisx has the lowest average return. Emerging market fund veiex has the highest standard deviation and the Long-term bond fund vbltx has the lowest standard deviation.
- US stock index: Vfinx performed the best. European stock index: veurx, emerging markets fund: veiex and pacific stock index: vpacx performed poorly, because they have a lower return and higher risk.
- There is a tradeoff between return and risk.
- The Sharpe Ratio measures excess return per unit of risk. S&P 500 has the largest Sharpe Ratio and the emerging markets fund has the lowest Sharpe Ratio.
- There is obvious positive linear relationship between S&P 500, European stock, Emerging market and pacific stock. There is also positive relationship between short-term and long-term bond market. There is nearly no relationship or negative relationship between the stock and bond market.
- None of correlations between the Vanguard assets are negative, making diversification difficult since we cannot short sale mutual funds.
- Value at risk over a one-month investment horizon is largest for emerging markets fund and smallest for long term bond. The same for one year horizon.
- The global minimum variance portfolio with short sales has a lower expected return and a higher standard deviation than the global minimum portfolio without short sales. The value at risk is greater with a global minimum variance portfolio without short sales.
- The tangency portfolio with no short sale has a higher expected return, higher standard deviation, and lower Sharpe Ratio than the tangency with short sale.
- Including risk-free asset into the portfolio reduce the portfolio risk.
- Mutual funds is a portfolio that has a relatively low risk and a low expected return.

## 1. RETURN CALCULATIONS AND SAMPLE STATISTICS

- Time plots of monthly prices and continuously compounded returns



The continuously compounded return of the 6 indexes seem to move together. In the end of 2011, the return suddenly drops to the lowest and returns to a high return soon afterwards. The big news happened that caused that drop is the August 2011 stock markets fall. It was the sharp drop in stock prices in August 2011 in stock exchanges across the United States, Middle East, Europe and Asia. This was due to fears of contagion of the European sovereign debt crisis to Spain and Italy, as well as concerns over France's current AAA rating, concerns over the slow economic growth of the United States and its credit rating being downgraded.

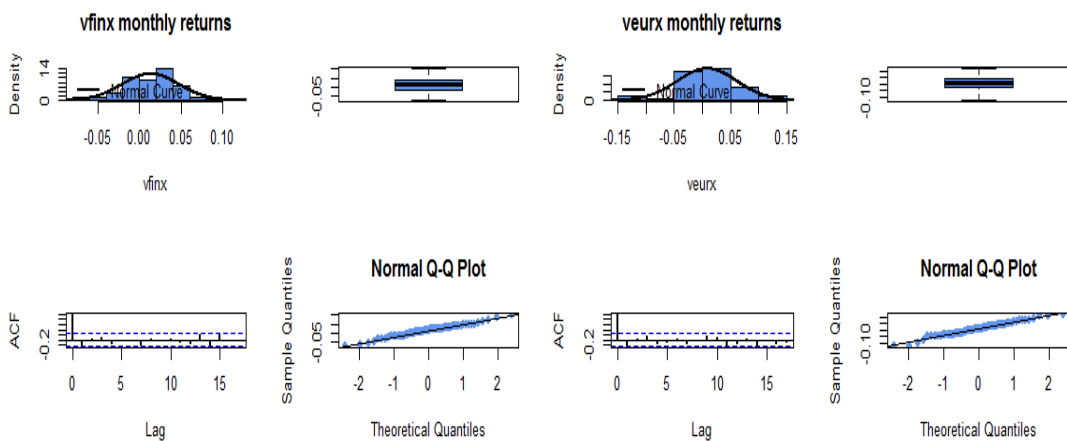


S&P 500 index in US market gives the highest future value of \$1 invested at the beginning of the five year period. I am not surprised because the US stock market is the biggest stock market in the world and its trading volume is the largest too. So its return will be certainly higher than other markets.

- **Four panel diagnostic plots for 6 assets**

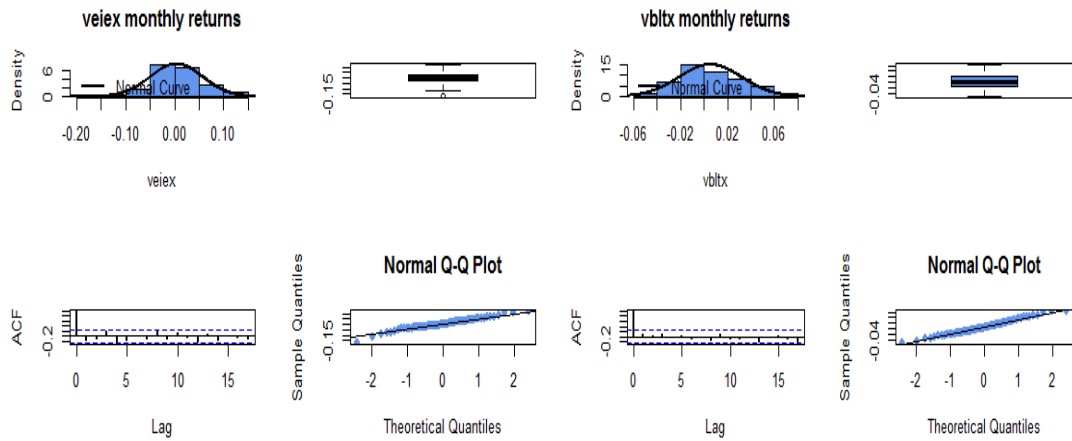
Vfinx is normal with mean slightly larger than 0 and its qq-plot converges to a straight line. There are no outlier. There is no linear time dependence.

Veux is normal. There is also no outlier. There is no linear time dependence.



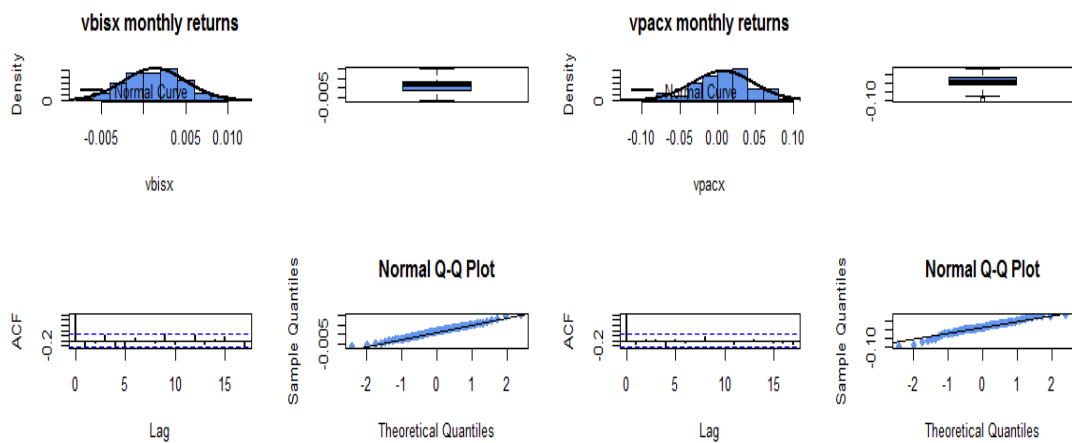
VeieX is normal. There is one outlier that is a very low return -15%. There is no linear time dependence.

Vbltx is normal with its mean slightly greater than 0. No outlier and no linear time dependence.



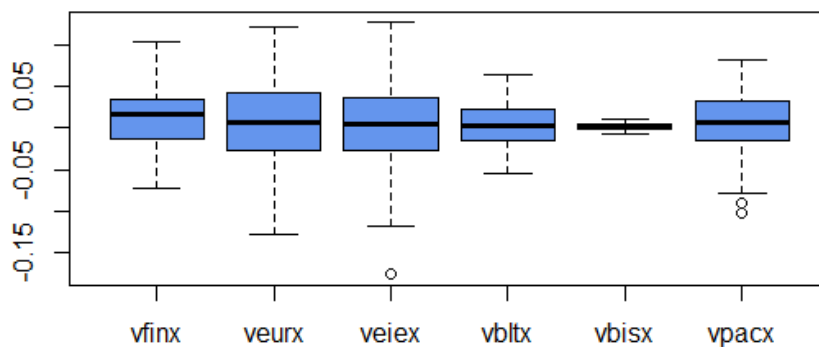
Vbix is normal with its mean slightly greater than 0. No outlier and no linear time dependence.

Vpacx is normal with two negative outliers. There is no linear time dependence.



- **Boxplots**

### Vanguard Returns





The mean return of 6 indexes are all close to zero. However, their standard deviation or volatilities are very different. European stock market has the largest volatility because of the Greece crisis in Europe during this period and the investors' confidences get stuck. While short-term bond market is the least volatile because US Treasury bond is a risk-free investment. Short-term bond is safer than long-term bond because people are less certain in a longer maturity period than shorter one as long time period investment is more unpredictable.

- **Univariate descriptive statistics for each return series**

**Univariate descriptive statistics**

	<b>vfinx</b>	<b>Veurx</b>	<b>veiex</b>	<b>Vbltx</b>	<b>vbisx</b>	<b>vpacx</b>
<b>Mean</b>	0.01320	0.00833	0.00325	0.00527	0.00133	0.00687
<b>Sd</b>	0.03425	0.05290	0.05382	0.02691	0.00372	0.04050
<b>Variance</b>	1.17e-03	2.80e-03	2.90e-03	7.24e-04	1.38e-05	1.64e-03
<b>Skewness</b>	-0.144	-0.269	-0.406	0.199	0.097	-0.532
<b>Excess Kurtosis</b>	0.329	0.204	1.224	-0.425	-0.319	0.223
<b>Quantile 1%</b>	-0.0666	-0.1242	-0.1415	-0.0499	-0.00618	-0.0951
<b>Quantile 5%</b>	-0.0468	-0.0844	-0.0762	-0.0357	-0.00472	-0.0690

S&P 500 vfinx has the highest return and Short-term bond fund vbisx has the lowest average return. 500 most profitable companies in US are more profitable and short-term bond pays very less return. Emerging market fund veiex has the highest standard deviation and the Long-term bond fund vbltx has the lowest standard deviation. That means long-term bond has the least risk and the emerging market has the highest risk. Emerging market fund veiex look least normally distributed because the absolute value of its skewness and excess kurtosis is the largest. Short-term bond fund vbisx is the most normally distributed one.

- **Sharpe's ratio and its standard error for each asset**

**Sharpe's ratio**

	<b>vfinx</b>	<b>Veurx</b>	<b>Veie</b>	<b>Vbltx</b>	<b>vbisx</b>	<b>vpacx</b>
<b>Sharpe's ratio</b>	0.3733	0.1497	0.0527	0.1802	0.2443	0.1593
<b>SE</b>	0.143	0.136	0.13	0.126	0.132	0.139

S&P 500 has the highest Sharpe's slope, which means the highest return over risk-free return per unit of risk. This is the best fund to invest in. The standard errors are pretty large compared to the original values. The Sharpe slopes are not estimated precisely enough.

- **Standard error for mean and standard deviation and their 95% confidence intervals**

	Mean	SE mean	95% lower	95% higher
Vfinx	0.0132	0.001704113	0.009791775	0.016608225
Veurx	0.00833	0.001075398	0.006179203	0.010480797
Veiox	0.00325	0.000419573	0.002410854	0.004089146
Vbltx	0.00527	0.000680354	0.003909292	0.006630708
Vbisx	0.00133	0.000171702	0.000986595	0.001673405
Vpacx	0.00687	0.000886913	0.005096174	0.008643826

	SD	SE sd	95% lower	95% higher
Vfinx	0.03425	0.003126583	0.027996834	0.040503166
Veurx	0.0529	0.004829087	0.043241826	0.062558174
Veiox	0.05382	0.004913071	0.043993857	0.063646143
Vbltx	0.02691	0.002456536	0.021996929	0.031823071
Vbisx	0.00372	0.000339588	0.003040824	0.004399176
Vpacx	0.0405	0.003697127	0.033105745	0.047894255

Yes, these means and standard deviations are estimated very precisely. The estimated standard deviation is more precise because standard error of standard deviation is calculated by itself over squared root of 2 times the sample size. Its denominator is greater than that of standard error of the mean, so its standard error is smaller compared to itself. Therefore, it's more precise.

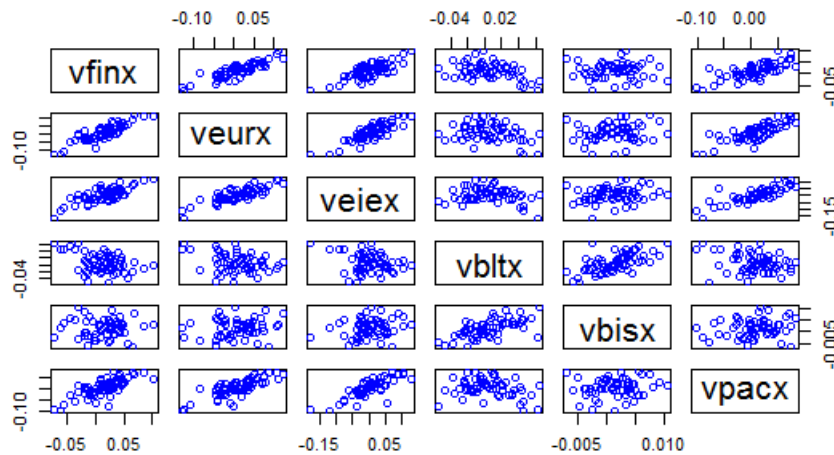
- **Annual Estimates**

#### Annual descriptive statistics

	vfinx	Veurx	Veiox	Vbltx	vbisx	vpacx
<b>Mean</b>	0.1584	0.1000	0.0391	0.0632	0.0159	0.0824
<b>Sd</b>	0.1186	0.1833	0.1864	0.0932	0.0129	0.1403
<b>Sharpe's ratio</b>	1.293	0.518	0.183	0.624	0.846	0.552
<b>Return after 5 yrs</b>	2.208	1.649	1.216	1.372	1.083	1.510

Yes, the asset rankings are the same as with the monthly Sharpe's ratio. The return on vfinx is still the highest after 5 years using the annual cc return rate.

- **Pair-wise scatter plots between 6 assets**

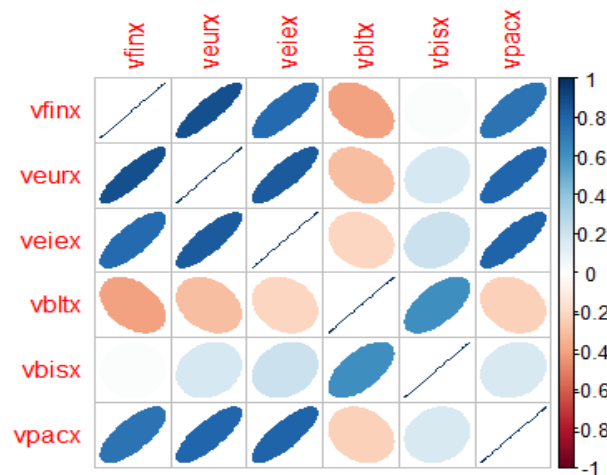


**Covariance matrix of returns on six assets**

	vfinx	veurx	veiex	Vbltx	vbisx	vpacx
Vfinx	0.001173	0.00158	0.001424	-0.00037	1.91E-06	0.001014
Veurx	0.00158	0.002799	0.002366	-0.00044	3.53E-05	0.001705
Veieix	0.001424	0.002366	0.002896	-0.00031	4.40E-05	0.001765
Vbltx	-0.00037	-0.00044	-0.00031	0.000724	6.17E-05	-0.00026
Vbisx	1.91E-06	3.53E-05	4.40E-05	6.17E-05	1.38E-05	2.48E-05
Vpacx	0.001014	0.001705	0.001765	-0.00026	2.48E-05	0.00164

There is obvious positive linear relationship between S&P 500, European stock, Emerging market and pacific stock. That means different regional stock markets in the world are affected by the same news and in the same market trend. There is also positive relationship between short-term and long-term bond market as the interest rates are set by the Fed at the same time. There is nearly no relationship or negative relationship between the stock and bond market because they are different types of markets and are affected by different factors.

- **Correlation matrix of the returns on 6 assets**



**Estimated correlation values**

	<b>vfinx</b>	<b>Veurx</b>	<b>Veieix</b>	<b>Vbltx</b>	<b>Vbisx</b>	<b>vpacx</b>
<b>Vfinx</b>	1.000	0.872	0.773	-0.405	0.015	0.731
<b>Vueurx</b>	0.872	1.000	0.831	-0.308	0.180	0.796
<b>Veieix</b>	0.773	0.831	1.000	-0.212	0.220	0.810
<b>Vbltx</b>	-0.405	-0.308	-0.212	1.000	0.616	-0.234
<b>Vbisx</b>	0.015	0.180	0.220	0.616	1.000	0.164
<b>Vpacx</b>	0.731	0.796	0.810	-0.234	0.164	1.000

US stock market and European stock market are the most correlated. Emerging stock market and long-term bond market are the least correlated. Yes, so that the last term of the portfolio variance is minimized. Especially when the portfolio contains stocks and bonds at the same time, the risk is largely reduced as their correlation are negative.

- **JB statistics to test null hypothesis: if the monthly return is normal**

	<b>vfinx</b>	<b>Veurx</b>	<b>Veieix</b>	<b>vbltx</b>	<b>vbisx</b>	<b>vpacx</b>
<b>JB stat</b>	0.477	0.829	5.4	0.848	0.348	2.95
<b>p-value</b>	0.7878	0.6608	0.06724	0.4544	0.8401	0.2289

The JB statistics of all six asset returns are smaller than 6 and their probability is greater than 5% significance level. So we accept the null hypothesis that the six asset returns are all normally distributed.

So I can conclude from the above result that the average monthly return is close to zero. There are always losses and gains from either the stock or the bond market over time, but overall the net gain is zero.

## 2. VALUE-AT-RISK CALCULATIONS

- **1% and 5% Value at Risk of the \$100,000 investment over a one month investment horizon**

**1% and 5% Value at Risk**

	<b>Vfinx</b>	<b>veurx</b>	<b>veiex</b>	<b>vbltx</b>	<b>vbisx</b>	<b>vpacx</b>
<b>1% VaR</b>	-6431	-10480	-11480	-5573	-730	-8365
<b>SE</b>	882	1329	1557	533	80.4	1080
<b>Lower CI</b>	-8025	-13147	-14481	-6483	-876	-10227
<b>Upper CI</b>	-4549	-7909	-8550	-4426	-555	-6087
<b>5% VaR</b>	-4221	-7567	-8173	-3825	-478	-5800
<b>SE</b>	707	1059	1237	430	69.6	908
<b>Lower CI</b>	-5545	-9533	-10534	-4616	-602	-7424
<b>Upper CI</b>	-2800	-5411	-5681	-2950	-326	-3997

At 1% value at risk, long-term bond has the lowest lost and emerging market has the highest lost per month. It's the same at 5% value at risk. The VaR is not precise enough.

- **Annualized mean and standard deviation and determine 1% and 5% value-at-risk over one-year investment horizon**

**Annual statistics and VaR**

	<b>Vfinx</b>	<b>Veurx</b>	<b>veiex</b>	<b>vbltx</b>	<b>vbisx</b>	<b>Vpacx</b>
<b>Mean</b>	0.1584	0.1000	0.0391	0.0632	0.0159	0.0824
<b>SD</b>	0.1186	0.1833	0.1864	0.0932	0.0129	0.1403
<b>1% VaR</b>	-77172	-125760	-137760	-66876	-8760	-100380
<b>5% VaR</b>	-33600	-64932	-68172	-35400	-3912	-69600

- **Empirical 1% and 5% quantiles of the return distribution (historical simulation)**

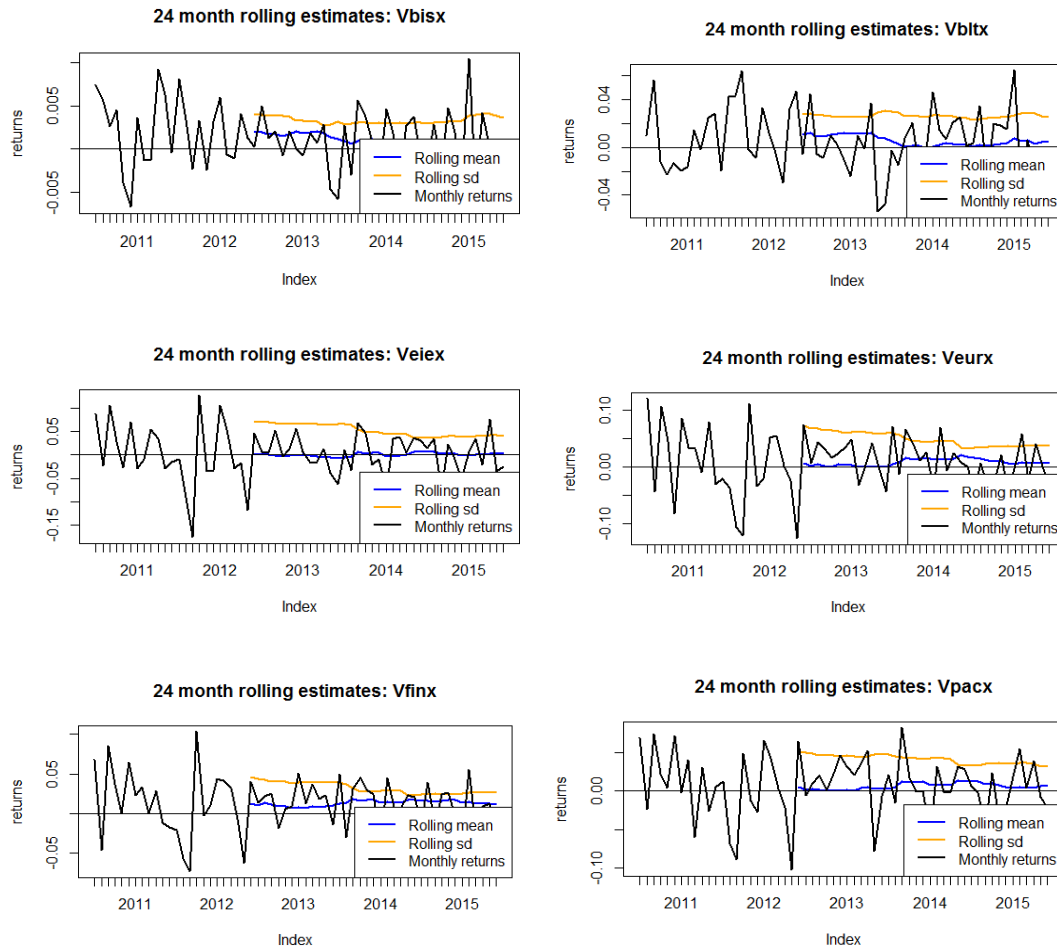
**Empirical VaR at 1% and 5%**

	<b>Vfinx</b>	<b>Veurx</b>	<b>veiex</b>	<b>vbltx</b>	<b>vbisx</b>	<b>vpacx</b>
<b>1% VaR</b>	-6446	-11676	-13196	-4867	-616	-9072
<b>5% VaR</b>	-4576	-8098	-7335	-3508	-471	-6670

The empirical value at risk are bigger than the estimated ones. That means the historical data actually have greater losses than estimations.

### 3. ROLLING ANALYSIS OF THE CER MODEL PARAMETERS

- **24 month rolling estimates of mean and standard deviation of the continuously compounded return**



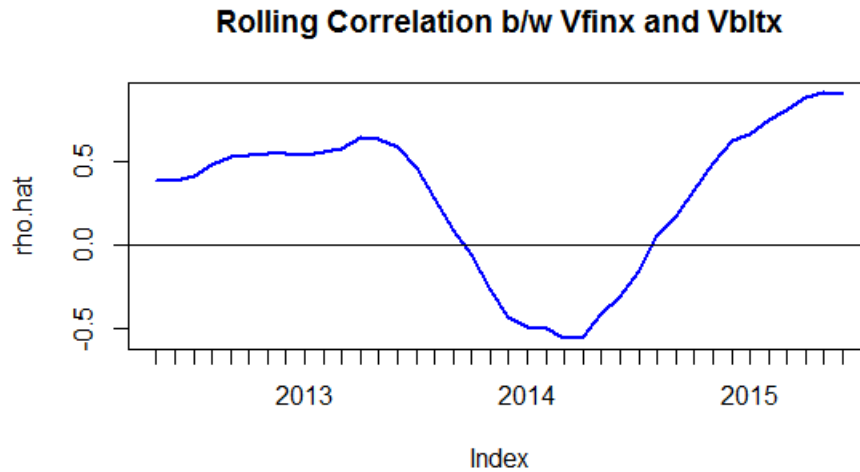
The funds that have the most stable rolling standard deviation are the Long-term and short-term bond funds. The most stable rolling mean is the Emerging markets fund that has a mean close to zero all the way.

- **24 month rolling estimates of the sample correlation between the S&P 500 index and the long-term bond index**

**Rolling Correlation b/w Vfinx and Vbltx**

<b>May 2012</b>	0.3873	<b>Jun 2013</b>	0.5869	<b>Jul 2013</b>	-0.1531
<b>Jun 2012</b>	0.3876	<b>Jul 2013</b>	0.4633	<b>Aug 2013</b>	0.0566
<b>Jul 2012</b>	0.4077	<b>Aug 2013</b>	0.2746	<b>Sept 2014</b>	0.1680
<b>Aug 2012</b>	0.4811	<b>Sept 2013</b>	0.0854	<b>Oct 2014</b>	0.3231
<b>Sept 2012</b>	0.5269	<b>Oct 2013</b>	-0.0615	<b>Nov 2014</b>	0.4918
<b>Oct 2012</b>	0.5417	<b>Nov 2013</b>	-0.2728	<b>Dec 2014</b>	0.6268

<b>Nov 2012</b>	0.5418	<b>Dec 2013</b>	-0.4361	<b>Jan 2015</b>	0.6661
<b>Dec 2012</b>	0.5424	<b>Jan 2014</b>	-0.4870	<b>Feb 2015</b>	0.7474
<b>Jan 2013</b>	0.5323	<b>Feb 2014</b>	-0.5028	<b>Mar 2015</b>	0.8033
<b>Feb 2013</b>	0.5575	<b>Mar 2014</b>	-0.5615	<b>Apr 2015</b>	0.8864
<b>Mar 2013</b>	0.5720	<b>Apr 2014</b>	-0.5449	<b>May 2015</b>	0.9080
<b>Apr 2013</b>	0.6406	<b>May 2014</b>	-0.4157	<b>Jun 2015</b>	0.9019
<b>May 2013</b>	0.6333	<b>Jun 2014</b>	-0.3047		



The correlation is not stable between May 2012 and June 2015, where the highest is close to 1 in June 2015 and the lowest is a negative value close to -0.5 in March 2014.

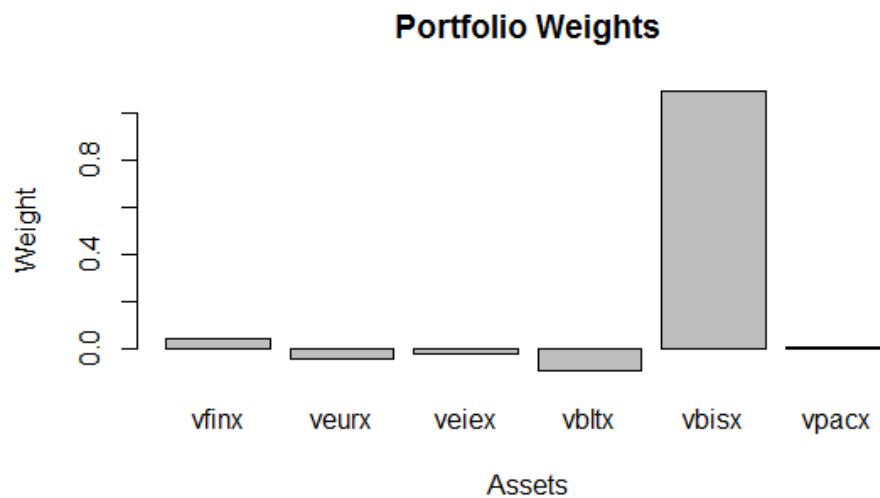


#### 4. PORTFOLIO THEORY

- **Global minimum variance portfolio analysis**

**Global Minimum Variance Portfolio**

	Vfinx	veurx	VeieX	vbltx	Vbisx	vpacx
<b>Portfolio weights</b>	0.0469	-0.0410	-0.0163	-0.0879	1.0925	0.0057
<b>Expected return</b>	0.00125					
<b>Standard deviation</b>	0.00278					



There are three negative weights in the global minimum variance portfolio: veurx, veieX, vbltx (the most negative). To minimize the portfolio variance is to reduce the weights of the funds that have the large risks.

- **Compare annual and monthly statistics of mean, standard deviation and Sharpe's ratio**

**Individual asset's monthly statistics**

	Vfinx	Veurx	veieX	Vbltx	vbisx	vpacx
<b>Mean</b>	0.01320	0.00833	0.00325	0.00527	0.00133	0.00687
<b>Sd</b>	0.03425	0.05290	0.05382	0.02691	0.00372	0.04050

**Global Minimum Variance Portfolio Statistics**

	Mean	Standard deviation	Sharpe ratio
<b>Monthly</b>	0.00125	0.00278	0.299
<b>Annual</b>	0.015	0.00518	1.93

Portfolio standard deviation is smaller than standard deviation of any asset. It implies that portfolio diversification reduces risk. But we trade off average return to minimize portfolio risk.

**1% and 5% Value at Risk for portfolio and individual assets**

	Vfinx	Veuxx	veiex	vbltx	vbisx	vpacx
<b>1% VaR</b>	-6431	-10480	-11480	-5573	-730	-8365
<b>5% VaR</b>	-4221	-7567	-8173	-3825	-478	-5800
<b>1%</b>	-521.65					
<b>5%</b>	-332.19					

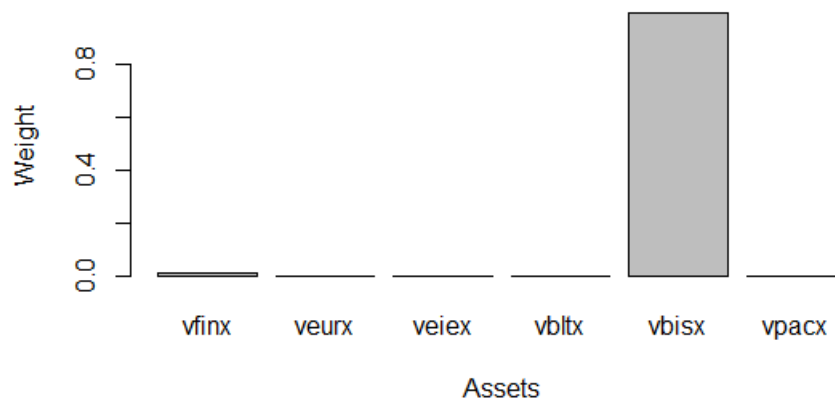
Portfolio value-at-risk is largely reduced after diversification.

● **Global Minimum Variance Portfolio with no short-sales**

**Global Minimum Variance Portfolio without short-sales**

	Vfinx	veuxx	veiex	vbltx	vbisx	vpacx
<b>Portfolio weights</b>	0.0101	0	0	0	0.9899	0
<b>Expected return</b>	0.00144					
<b>Standard deviation</b>	0.0037					

**Portfolio Weights**



**Annual Global Min Short-sale/ No short-sale**

	Mean	Standard deviation	Sharpe ratio
<b>Short sale</b>	0.015	0.00518	1.93
<b>No short sale</b>	0.0173	0.00689	1.79

Global minimum variance portfolio that doesn't allow short-sales has a higher average return but also a higher risk. Its shape ratio is lower than the short-sales'. That means the portfolio with short-sale is better. That's why we do short sales in our interests.

**1% and 5% Value at Risk for Global Min with Short-sale/ No short-sale**

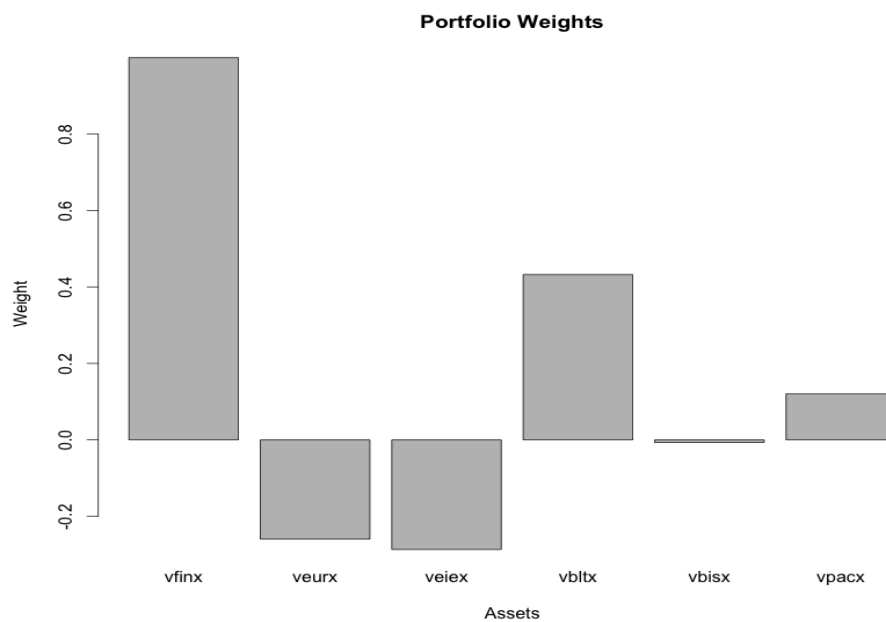
<b>1% VaR short</b>	-521.65
<b>5% VaR short</b>	-332.19
<b>1% VaR no short</b>	-607.60
<b>5% VaR no short</b>	-470.36

The portfolio with no short sale has higher value-at-risk than the portfolio with short sale.

- **Efficient Portfolio Frontier with target return equals max average return**

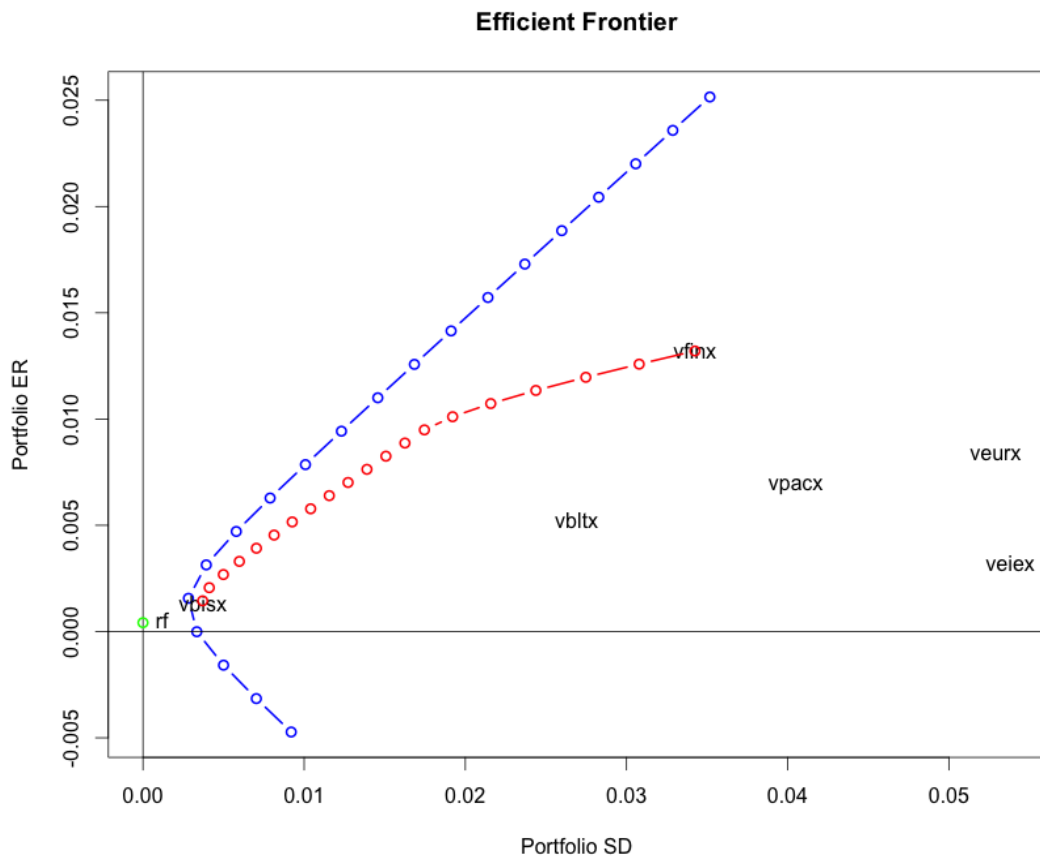
**Efficient Portfolio Frontier**

	vfinx	veurx	veiex	vbltx	vbisx	vpacx
<b>Portfolio weights</b>	1.0	-0.2597	-0.2868	0.4325	-0.0067	0.1206
<b>Expected return</b>	0.0132					
<b>Standard deviation</b>	0.0177					



**Efficient portfolio (no short)**

	vfinx	veurx	veiex	vbltx	vbisx	vpacx
<b>Portfolio weights</b>	1	0	0	0	0	0
<b>Expected return</b>	0.0132					
<b>Standard deviation</b>	0.0342					
<b>Sharpe Ratio</b>	0.373					



- **Approximate cost in expected return of investing in a no short sale efficient portfolio versus a short sale efficient portfolio with a target volatility of 2%**

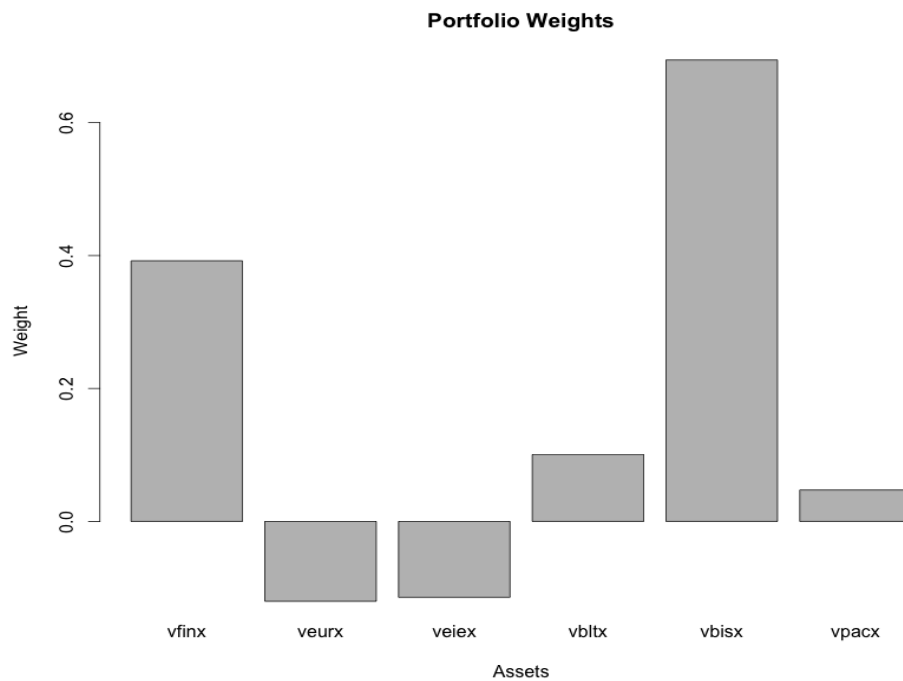
**Target Volatility 2% compare: 0.005 from the graph**

	Expected return
<b>No short efficient</b>	0.009
<b>Short efficient</b>	0.014

**portfolio with short-sale has a higher return than that does not.**

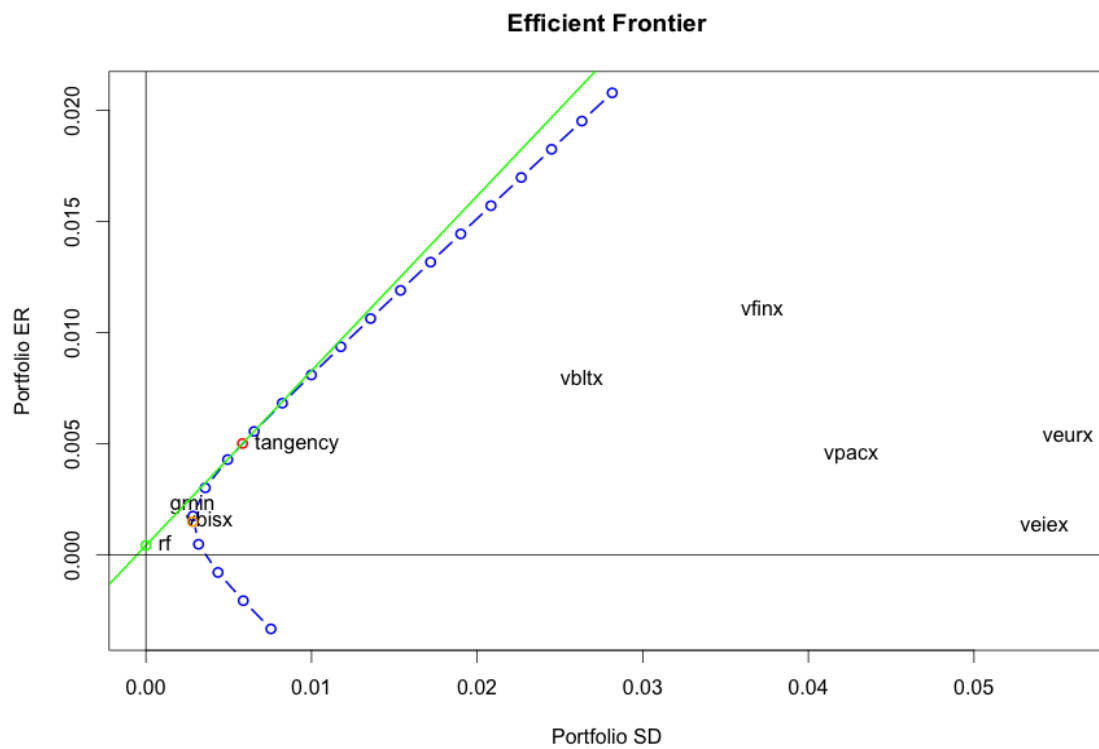
- Tangency portfolio with a monthly risk free rate = 0.0004167

	vfinx	veurx	veiex	vbltx	vbisx	vpacx
<b>Portfolio weights</b>	0.3922	-0.1202	-0.1143	0.1006	0.6943	0.0473
<b>Expected return</b>	0.00558					
<b>Standard deviation</b>	0.00693					
<b>Variance</b>	0.00004802					
<b>Sharpe ratio</b>	0.745					
<b>Annual return</b>	0.06696					
<b>Annual SD</b>	0.024					
<b>Annual Sharpe ratio</b>	2.58					



Veurx and veiex have negative weights for tangent portfolio.

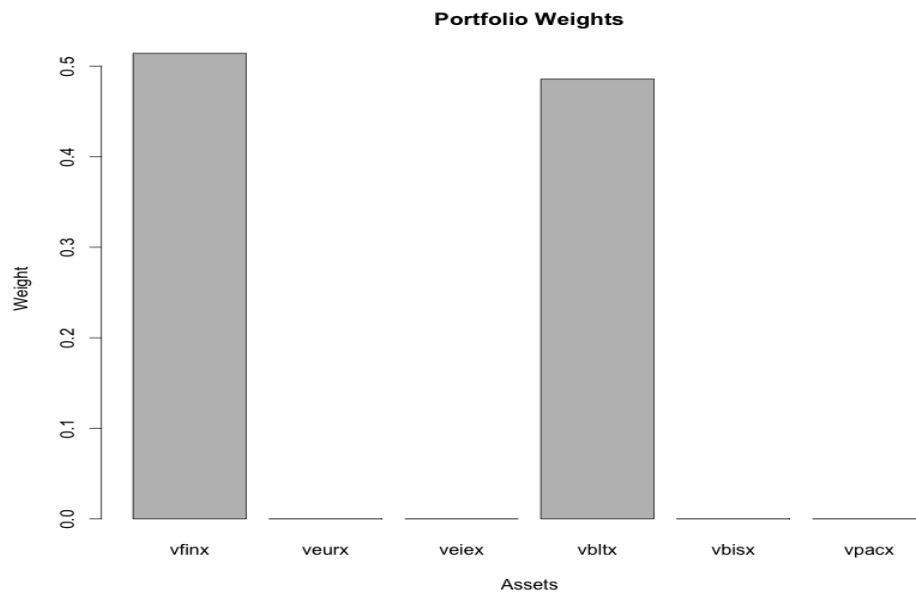
- Plot the Efficient Frontier, Global min and Tangency portfolio



- Tangency portfolio that short-sales not allowed

**Tangency portfolio no short**

	vfinx	veurx	veiex	vbltx	vbisx	vpacx
<b>Portfolio weights</b>	0.514	0	0	0.486	0	0
<b>Expected return</b>	0.00935					
<b>Standard deviation</b>	0.0172					
<b>Variance</b>	0.000029584					
<b>Sharpe ratio</b>	0.52					
<b>Annual return</b>	0.1122					
<b>Annual sd</b>	0.0596					
<b>Annual Sharpe ratio</b>	1.80					



Tangency portfolio no short-sale does not have negative weights and the portfolio weight distributed on vbltx and vfinx is about half and half. However, tangency portfolio has most of its weight on vbisx instead.

## 5. ASSET ALLOCATION

- **Efficient portfolio with a target expected return of 6% per year and no short sales**

### Efficient portfolio expected return of 0.5% (no short)

	Vfinx	veurx	veiex	vbltx	vbisx	vpacx
<b>Portfolio weights</b>	0.244	0	0	0.196	0.560	0
<b>Expected return</b>	0.005					
<b>Standard deviation</b>	0.00897					
<b>1% VaR</b>	-1585.48					
<b>5% VaR</b>	-947					

- **Efficient portfolio with a target expected return of 12% per year and no short sales**

### Efficient portfolio expected return of 1% (no short)

	Vfinx	veurx	veiex	Vbltx	vbisx	vpacx
<b>Portfolio weights</b>	0.597	0	0	0.404	0.560	0
<b>Expected return</b>	0.01					
<b>Standard deviation</b>	0.0189					
<b>1% VaR</b>	-3391.79					
<b>5% VaR</b>	-2103.76					

Higher target return trade off a higher volatility of efficient portfolio. Value at risk is also higher.