Strategic Asset Allocation during Global Uncertainty

Agenda

Introduction
Case Study Overview.

Past Investment Performance
Analysis of Investors Portfolio Performance.

Constructing Efficient Portfolios
Qualitative and Quantitative Analysis.

Optimal Allocation Recommendation
Final Recommendation of Asset Allocation According to the Investors Needs.

Conclusion
Summary and Final Thoughts.

Introduction

- Financially literate investor based in Singapore.
- We assume the investor to be risk averse.
- The investor is evaluating whether to reallocate his portfolio due to upcoming tuition expenses for his two daughters.
- Refrained from investing into the US market after the financial crisis.
- As of 2017 market outlooks for Europe, India, China and the US remain uncertain.
- Broker sent information, now investor considers reshuffling his portfolio based on the recommended securities and putting more weights into the US.
- Current portfolio makeup unknown.
- Before answering whether he should reshuffle, let's have a look at his portfolios past performance!

Past Investment Performance

Assumptions:

- Investor has been making annual contribution of ~$10,000.00, based on his current contribution.
- He views the $10,000.00 contribution as sunk cost and is indifferent to whether he is able to retain the contributions or spend it on his children's tuition.

Initial Investment Performance:	
Portfolio T(-20):	100000
Portfolio T0:	500000
Years:	20
Annual Contr.:	10000
CAGR:	4.19%
Cum. Return:	127.24%

Investor vs. STI Index			
Metric	Index	Investor	Delta
CAGR	1.30%	4.19%	2.89%
Cum. Return:	29.52%	127.24%	97.72%

Investor vs. SP500 Index			
Metric	Index	Investor	Delta
CAGR	5.71%	4.19%	-1.52%
Cum. Return:	203.77%	127.24%	-76.53%

Findings:

- The investor outperforms his native STI index, while underperforming the S&P500.
- The exact makeup of his portfolio is not clear, therefore we assume broad stock indices to be valid barometers of performance.

Past Investment Performance Projection – Expense/Return Scenarios

Expense/Return Scenarios										
Time:		0		1		2		3		4
Estimated Expenses:		0	SGD	(30'000)	SGD	(60'000)	SGD	(60'000)	SGD	(30'000)
Annual Savings:	SGD	10'000	SGD	10'000	SGD	10'000	SGD	10'000	SGD	10'000
Base Case Portflio:	SGD	531'367	SGD	532'791	SGD	503'018	SGD	471'998	SGD	470'934

- Performance in the next 5 years:
  - In our base case, we assume the investor continues to contribute 10k annually and earn the same mean returns.
  - Based on the estimated expenses, his **portfolio will shrink in size by 30k or about 6%.**
  - If he is willing to incur the 6% loss and could potentially harvest certain losses for tax purposes, not rebalancing could be an option.

Past Investment Performance Projection

Portfolio Value Assuming 5.2% Annual Return & Net Cash Flows

Time:	t0		t1		t2		t3		t4	
Period Begin:	SGD	510'000	SGD	516'520	SGD	493'379	SGD	469'035	SGD	473'425
Period End:	SGD	536'520.00	SGD	543'379	SGD	519'035	SGD	493'425	SGD	498'043

- Given the outflows in the near future, the investor needs to earn around 5.2% per year in order to maintain the t0 balance of ~S$500k by the time his daughters both graduate from college.
- In this scenario, the investor is able to pay the tuition and not have to draw on his current principle.
  - He will, however, lose the annual 10k contribution (due to tuition expenses of S$50k, while the rest would be covered by the additional gains from rebalancing with the target return of 5.2% using a combination of the suggested funds.

Optimal Asset Allocation – E[r] = 5.20%

Optimal Portfolio Weights to Limit Principal Drawdown	
Stock	**Weight**
Lyxor ETF DJ Industrial Average	34.89%
Lyxor ETF MSCI Europe	0.00%
MSCI Emerging Markets Index	0.00%
MSCI China Index	0.00%
MSCI India TRN Index	0.00%
MSCI Russia Capped Index ETF	0.00%
iShares JPMorgan Asia Credit Bond Index	9.13%
iShares Barclays Asia High Yield Bond Index	0.00%
USD TREASURIES INFLATION-LINKED ETF	36.00%
Eurozone Government Bond ETF	11.32%
Vanguard REIT Index Fund	8.67%
SPDR Gold Trust	0.00%

Portfolio Stats	
Port Std:	4.99%
E[r]:	5.20%
Sharpe Ratio:	0.87

- In order to achieve his financial goals, the investor would not need to take on a high level of risk.
- Since his profile leans towards risk averse, this allocation fits his risk profile rather well.
- The solver suggests allocating heavily to fixed-income and developed market indices.

Adding Two Alternative Investment Vehicles – Pros & Cons

	Vanguard RE	Gold Trust (Gl	dustrial Aver	F MSCI Europ	g Markets In	na Index UCI	India TRN Ind	ea Capped Ind	Asia Credit Bo	ia High Yield E	RIES INFLATI	R) 1C (KF6-SG)
Vanguard REIT Index Fun	1											
SPDR Gold Trust (GLD-US)	-0.66481559	1										
Lyxor UCITS ETF DJ Indust	0.86381738	-0.87403971	1									
Lyxor UCITS ETF MSCI Eur	0.22880104	-0.55745384	0.51964913	1								
db x-trackers MSCI Emerg	-0.23069531	0.30356864	-0.12635984	0.46297028	1							
db x-trackers MSCI China	0.50165053	-0.50254647	0.64867361	0.57844809	0.42787826	1						
db x-trackers MSCI India T	0.73437014	-0.50547358	0.7061634	0.48433948	0.27555898	0.73761039	1					
db x-trackers MSCI Russia	-0.788425	0.73263614	-0.71436426	-0.06844709	0.5958495	-0.33646317	-0.52788674	1				
iShares JPMorgan USD As	0.62284089	-0.00084981	0.34838076	-0.0168236	0.15946454	0.3627594	0.58782217	-0.27397557	1			
iShares Barclays USD Asia	0.10543803	0.26650587	-0.0018865	0.18048816	0.58610061	0.24719209	0.30345907	0.32108335	0.72476434	1		
db x-trackers II IBOXX USI	0.1653897	0.48161529	-0.17004457	-0.44008397	0.14733654	-0.04015783	0.11523709	0.12348002	0.71213591	0.61645677	1	
db x-trackers II Eurozone	0.41059258	-0.48695587	0.54488682	0.78333515	0.32041399	0.33034197	0.4658288	-0.13155602	0.24435028	0.31295562	-0.17271442	1

Asset	Beta
GLD	-0.05
REIT	1.3

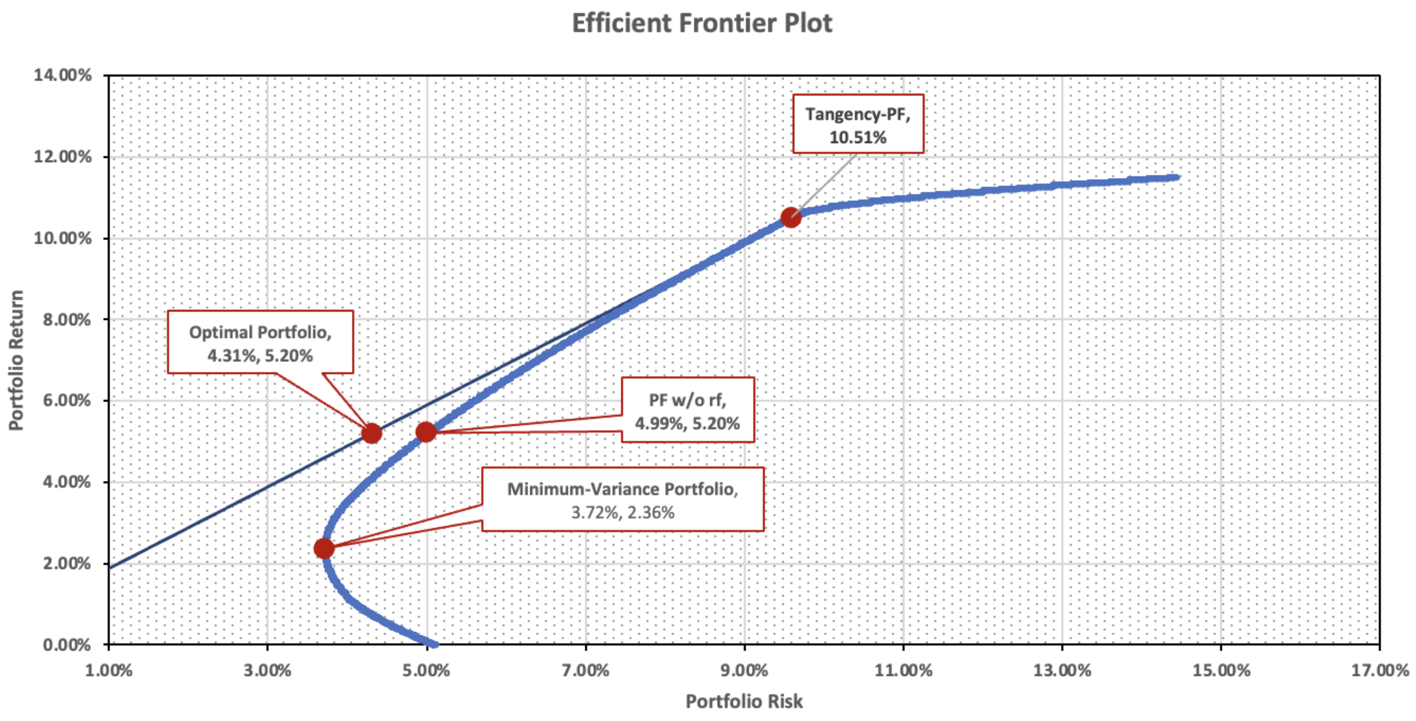
+

- Diversification benefits
- Gold and Real Estate rely less on market developments
- High negative correlation of Gold to other ETFs
- Rather low correlation between REIT and ETFs
- Gold is a safe-haven
- Due to low, negative beta, Gold will hedge portfolio
- Real Estate Fund embodies tangible asset

–

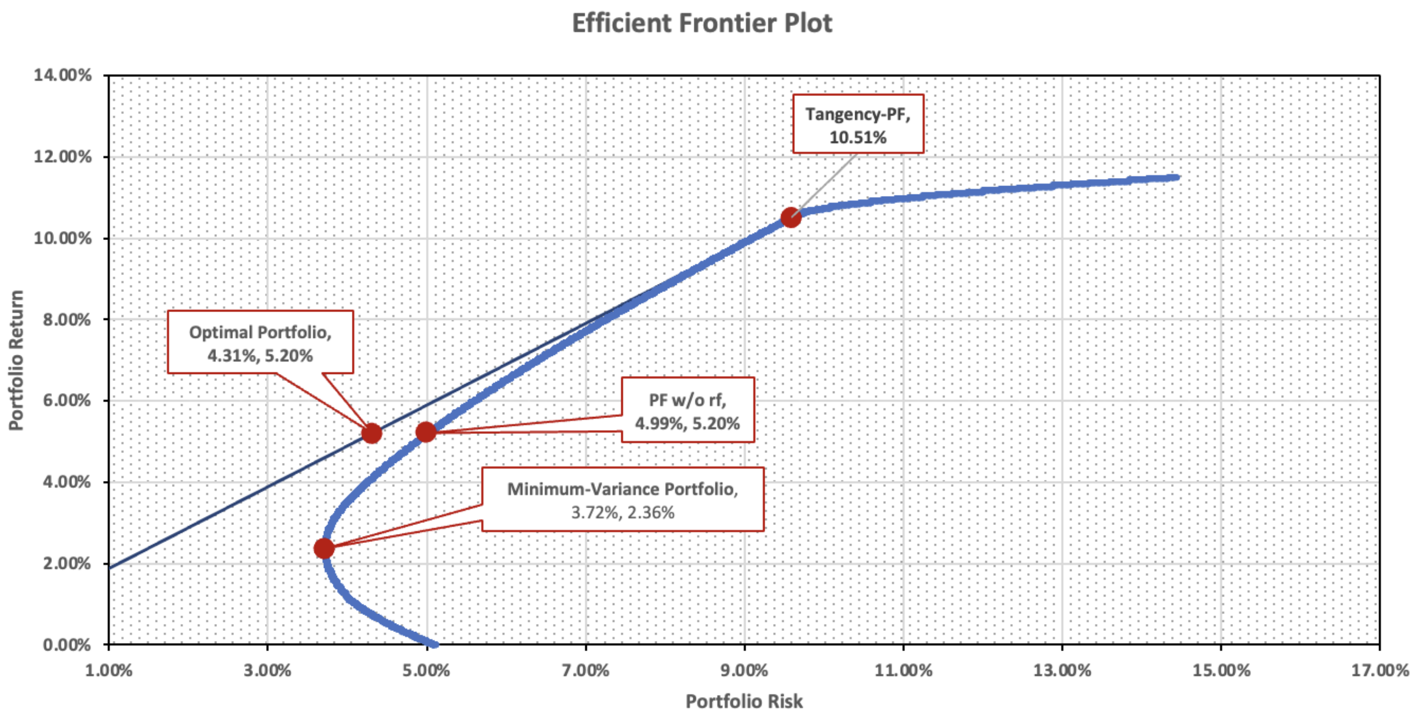
- Investor refrained from investing in the US market after the financial crisis, would he take the risk of another real estate bubble?
- Market outlooks are uncertain – Gold does not generate any value or profit
- Hedging the portfolio with gold is in our case due to its beta almost zero. It could reduce volatility of the portfolio, however, it couldn't recover high drawdowns.
- REIT is more volatile than the market

Optimal Asset Allocation – Minimum-Variance Portfolio



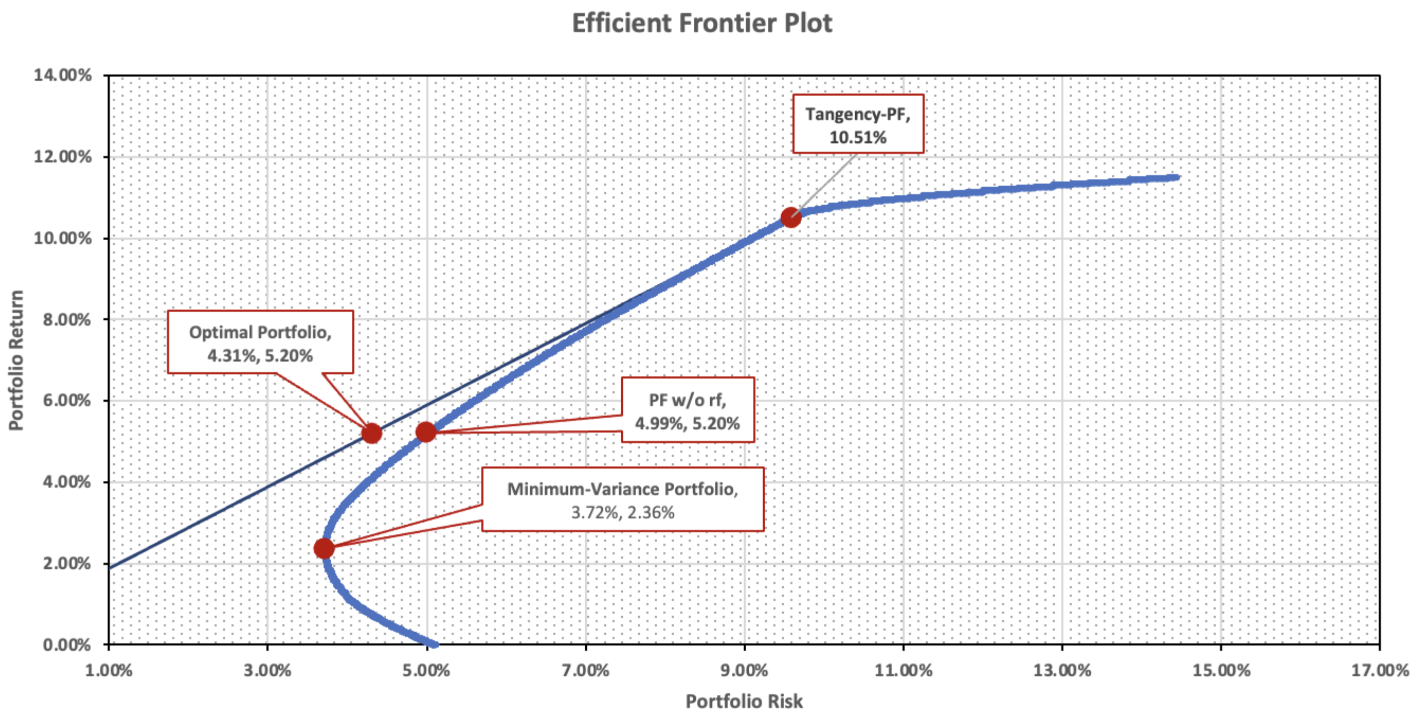
Optimal Minimum-Variance Portfolio Weights	
Stock	**Weight**
Lyxor ETF DJ Industrial Average	13.75%
Lyxor ETF MSCI Europe	0.00%
MSCI Emerging Markets Index	0.00%
MSCI China Index	0.00%
MSCI India TRN Index	0.00%
MSCI Russia Capped Index ETF	0.00%
iShares JPMorgan Asia Credit Bond Index	21.78%
iShares Barclays Asia High Yield Bond Index	5.44%
USD TREASURIES INFLATION-LINKED ETF	48.92%
Eurozone Government Bond ETF	10.10%
Vanguard REIT Index Fund	0.00%
SPDR Gold Trust	0.00%

Optimal Asset Allocation – Tangency Portfolio



TANGENCY PORTFOLIO	
Stock	**Weight**
Lyxor ETF DJ Industrial Average	62.08%
Lyxor ETF MSCI Europe	0.00%
MSCI Emerging Markets Index	0.00%
MSCI China Index	0.00%
MSCI India TRN Index	0.00%
MSCI Russia Capped Index ETF	0.00%
iShares JPMorgan Asia Credit Bond Index	0.00%
iShares Barclays Asia High Yield Bond Index	0.00%
USD TREASURIES INFLATION-LINKED ETF	0.00%
Eurozone Government Bond ETF	0.67%
Vanguard REIT Index Fund	37.25%
SPDR Gold Trust	0.00%

Optimal Asset Allocation – Optimal Portfolio with Risk Free Rate



Optimal Portfolio with risk free rate	
Weight rf	55.07%
Weight TP	44.93%
Return	5.20%
SD	4.31%
Sharpe-Ratio	**1.00**

Optimal Asset Allocation - Recommendation

Optimal Portfolio Weights to Limit Principal Drawdown	
Stock	**Weight**
Lyxor ETF DJ Industrial Average	34.89%
Lyxor ETF MSCI Europe	0.00%
MSCI Emerging Markets Index	0.00%
MSCI China Index	0.00%
MSCI India TRN Index	0.00%
MSCI Russia Capped Index ETF	0.00%
iShares JPMorgan Asia Credit Bond Index	9.13%
iShares Barclays Asia High Yield Bond Index	0.00%
USD TREASURIES INFLATION-LINKED ETF	36.00%
Eurozone Government Bond ETF	11.32%
Vanguard REIT Index Fund	8.67%
SPDR Gold Trust	0.00%

Portfolio Stats	
Port Std:	4.99%
E[r]:	5.20%
Sharpe Ratio:	0.87

- If he is unwilling or unable to invest at the Risk Free Rate, we suggest reallocating his portfolio to the portfolio optimized to prevent principal drawdown.
    - If able to invest at RFR, we suggest splitting between the risk free asset and the portfolio of risky assets.
- While the minimum variance portfolio suggests a portfolio optimized for volatility, it is not the right fit for our investor.

Optimal Minimum-Variance Portfolio Weights	
Stock	**Weight**
Lyxor ETF DJ Industrial Average	13.75%
Lyxor ETF MSCI Europe	0.00%
MSCI Emerging Markets Index	0.00%
MSCI China Index	0.00%
MSCI India TRN Index	0.00%
MSCI Russia Capped Index ETF	0.00%
iShares JPMorgan Asia Credit Bond Index	21.78%
iShares Barclays Asia High Yield Bond Index	5.44%
USD TREASURIES INFLATION-LINKED ETF	48.92%
Eurozone Government Bond ETF	10.10%
Vanguard REIT Index Fund	0.00%
SPDR Gold Trust	0.00%

Conclusion

- While the minimum variance portfolio is the optimal distribution, it is not suitable for this investor's needs.
- The tangency portfolio is the optimal risky portfolio, which for this basket of securities is a roughly two to one split between DJ and VNQ.
- Using this basket of stocks, the investor is able to build several portfolios which can assist in achieving his financial goals with manageable levels of risk.
- If the investor chooses to allocate towards the risk free asset, he can achieve the 5.2% necessary to preserve his principal while lowering his portfolio risk.