



Personal Finance: Another Perspective

Investing 9: Portfolio Evaluation, Rebalancing, and Reporting

Updated 2020-03-06



Objectives

- A. Understand portfolio rebalancing
- B. Understand the importance of portfolio management and performance evaluation
- C. Understand and calculate risk-adjusted performance measures
- D. Understand how to open up a mutual fund account



Investment Plan Assignments

Investments 9: Portfolio Rebalancing and Reporting

1. Determine the type of rebalancing you will likely use and how often you will rebalance, and include it in your investment plan under section IV.B.2 of your [Investment Plan](#) (LT05A).
2. Think through the new money/donations addendum, and how you will utilize it to minimize taxes and transactions costs in rebalancing
3. Determine how often you will monitor and report on your portfolio, and include it in IV.A.1.
4. Determine how you will communicate portfolio results and include it in section IV.C.



Investment Plan Assignments

Investments 10: Behavioral Finance

1. There are no required assignments for your Investment Plan from this section
 1. Read through and try to determine principles and ways Behavioral Finance can help you to be a better investor



Case Study

Data

- Steve and Suzie, both 45, are aggressive investors, and have a portfolio of over \$250,000. Their target asset allocation is 60% equities and 40% bonds and cash which they have invested in 10 mutual funds. Their actual asset class weights are different from their targets due to the out-performance of the equity part of their portfolios.

Asset Class	Actual Weight	Target Weight	Difference
Equity	70%	60%	10%
Bonds	20%	30%	-10%
Cash	10%	10%	0%

Application: When should they rebalance their portfolio and, how should they do it effectively (including costs and taxes)?



A. Understand Portfolio Rebalancing

- What is portfolio rebalancing?
 - The process of bringing portfolios back in line into given target asset allocation percentages so you can maintain your target risk level
- What causes the need to rebalance?
 - Changes occur due to:
 - Asset class performance
 - Changes in investor objectives or risk
 - Introduction of new capital
 - Introduction of new asset classes



Portfolio Rebalancing (continued)

- Why is this rebalancing so critical?
 - There are competing principles:
 - Minimize transactions costs and taxes
 - Minimize tracking error at your risk level
 - What is tracking error?
 - It is the return that is lost or gained from your actual portfolio being different from your target portfolio
 - What are the different ways of rebalancing?
 - There are different ways. The most used are:
 - Periodic-based (or calendar-based)
 - Percent-range-based (or volatility-based)



Portfolio Rebalancing (continued)

- Periodic-based rebalancing
 - Specify a time period, i.e. bi-annually, annually, etc. After each time period, rebalance the portfolio back to your original asset allocation targets
 - Advantages
 - Most simple of the methods
 - Longer periods have lower transactions and tax costs (but higher tracking error costs)
 - Disadvantages
 - Independent of market performance
 - Performance will depend on relative timing of large market moves and rebalancing



Portfolio Rebalancing (continued)

- Percent-range-based rebalancing
 - Rebalance the portfolio every time actual holdings are +/-5% (or +/-10%) from target ratios. Rebalance whenever you are outside this range
 - Advantages
 - Easy to implement
 - Wider ranges will reduce transactions costs (at the expense of higher tracking error)
 - Asset performance will trigger rebalancing
 - Disadvantages
 - Setting an effective range is difficult
 - Assets with higher target ranges and volatility will generate the most rebalances



Portfolio Rebalancing (continued)

- “NMD” (New Money / Donations) Addendum
 - Since you pay yourself monthly and are very careful in your selection of assets, you can combine the previous strategies with a “New Money / Donation” strategy to effectively rebalance
 - New Money. Rebalance as determined previously. But use monthly new money to purchase “underweight” assets, so you do not sell and incur taxable events. This works in both taxable and retirement accounts
 - In addition, this strategy helps you to buy “low,” as you are generally purchasing underperforming asset classes



Portfolio Rebalancing (continued)

- NMD Addendum (continued)
 - Donations. In taxable accounts, rebalance your portfolio using appreciated assets for your charitable contributions (see Learning Tool 8)
 - Donate “*appreciated*” assets for your charitable contributions. Then use the money you would have spent on contributions to purchase underweight assets
 - This way you eliminate your capital gains taxes for the contributed assets, and you get the full benefit of the deduction for your taxes, i.e., you sell “high” without tax consequences



Portfolio Rebalancing (continued)

- Which are the best methods?
 - Generally, for most investors with fewer investable assets, the easiest is likely to be most useable
 - Generally, a combination of periodic-based or percent-range-based rebalancing is most useful with the NMD addendum
 - Review the portfolio annually, but only rebalance when you are +/- 5% to +/-10% (or some range) beyond your targets. Then rebalance back to your targets
 - Remember, the goal is to minimize transactions costs, taxes, and tracking error costs



Questions

- Any questions on portfolio rebalancing?
 - We are truly selling high and buying low
 - Our investment strategy is dollar cost averaging (20% with 15% into retirement accounts monthly) and portfolio rebalancing using new money/donations strategy



B. Understand the Importance of Portfolio Management and Evaluation

- What is portfolio management?
 - The development, construction, and management of a portfolio of financial assets to attain an investor's specific goals
- What is performance evaluation?
 - The process of evaluating a portfolio's performance with the goal of understanding the key sources of return
- Why are these two topics so important?
 - Both are complicated subjects and both are critical to investing



Management and Evaluation (continued)

- What is “active” portfolio management?
 - The process of using publicly available data to actively manage a portfolio in an effort to:
 - Beat the benchmark after all transactions costs, taxes, management, and other fees
 - However, you must do this consistently year-after-year, and not just from luck
- Why is “active” management such a hot topic?
 - Management fees for mutual funds which can consistently outperform their benchmarks are 5-25 times higher than those on passive management (19 basis points versus 250 basis points)



Management and Evaluation (continued)

- What is “passive” portfolio management?
 - The process of buying a diversified portfolio which represents a broad market index (or benchmark) without any attempt to outperform the market or pick stocks
- Why is “passive” management such a hot topic?
 - Most active managers fail to outperform their benchmarks, especially after costs and taxes
 - Investors have realized that if you can’t beat them, join them, so they buy low-cost passive funds which meet their benchmarks consistently and minimize taxes



Management and Evaluation (continued)

- What factors lead to above-benchmark or excess returns?
 - 1. Superior asset allocation
 - Shifting assets between a poor-performing asset class and a better performing asset class, i.e. between large cap to international or small cap
 - 2. Superior stock selection
 - Picking sectors, industries, or companies within a specified benchmark which, as a whole, outperform the return on the specified benchmark



Management and Evaluation (continued)

- What is superior asset allocation?
 - The process where the investor gains a higher return than the benchmark from adjusting the investment portfolio for movements in the market
 - The investor shifts among stocks, bonds and other asset classes based on their expectations for returns from each of the asset classes
 - What are the results?
 - Done well, superior asset allocation yields higher returns with lower risk.
 - Done poorly, it yields lower returns, higher transactions costs, and higher taxes



Management and Evaluation (continued)

- What is superior stock selection?
 - The process where the investor builds an investment portfolio which earns returns in excess of the benchmark through buying or selling undervalued stocks, sectors or industries
 - The investor shifts among the various securities of the index in an attempt to buy the securities with the highest growth potential
 - What are the results?
 - Done well, superior selection yields higher returns with lower risk.
 - Done poorly, it yields lower returns, high transactions costs, and high taxes



Management and Evaluation (continued)

- What is portfolio evaluation?
 - The process of monitoring financial asset performance in your portfolio, comparing asset performance to the relevant benchmarks
 - It is determining how well the fund is meeting its objectives. If the assets are underperforming benchmarks, the investor may sell and purchase other assets
 - What are the results?
 - It allows you to see how all assets are doing
 - Unless you monitor performance, you will not know how well you are doing in working toward accomplishing your objectives



Management and Evaluation (continued)

- How do you evaluate performance?
 - Calculate:
 - 1. The period return on each owned asset
 - 2. The period index return for each benchmark
 - 3. The difference between the asset return and benchmark return
 - 4. The weight of each asset or portfolio in the overall portfolio
 - 5. The overall portfolio return
 - With this information, you can know how each asset is performing versus its benchmark, and how well the portfolio is moving toward its objectives



Management and Evaluation (continued)

- What is portfolio reporting?
 - The process of reviewing portfolio performance with the necessary participants, i.e. your accountability partners
 - If you are managing your portfolio, you should report performance to your spouse at least monthly or quarterly
 - If others are helping you manage your portfolio, they should report performance to you and your spouse at least quarterly as well.
 - Be careful not to do too much buying and selling, as these incur transactions costs and taxes



Questions

- Any questions on the importance of portfolio management and evaluation?



C. Calculate Risk-adjusted Performance

- How do you determine whether a portfolio manager is out-performing, i.e., generating excess returns or returns above the manager's benchmark?
 - Is it only returns?
- Should you also be concerned about risk?
 - It is not just returns that matters—they must be adjusted for risk.
- There are a number of recognized performance measures available:
 - Sharp Index
 - Treynor Measure
 - Jensen's Measure



Risk Adjusted Performance: Sharpe

- Sharpe Index
 - A ratio of your “excess return” divided by your portfolio standard deviation

$$\frac{r_p - r_f}{s_p}$$

- r_p = Average return on the portfolio
- s_p = Standard deviation of portfolio return
- The Sharpe Index is the portfolio risk premium divided by portfolio risk as measured by standard deviation



Risk Adjusted Performance: Treynor

- Treynor Measure
 - This is similar to Sharpe but it uses the portfolio beta instead of the portfolio standard deviation

$$\frac{\bar{r}_p - r_f}{\beta_p}$$

\bar{r}_p = Average return on the portfolio

r_f = Average risk free rate

β_p = Weighted average b for portfolio

- It is the portfolio risk premium divided by portfolio risk as measured by beta



Risk Adjusted Performance: Jensen

- Jensen's Measure
 - This is the ratio of your portfolio return less CAPM determined portfolio return

$$\bullet \quad a_p = r_p - [r_f + \beta_p (r_m - r_f)]$$

a_p = Alpha for the portfolio

r_p = Average return on the portfolio

β_p = Weighted average Beta

r_f = Average risk free rate

r_m = Average return on the market index portfolio

- It is portfolio performance less expected portfolio performance from CAPM



Risk-adjusted Performance

- Where can you find risk-adjusted measures such as those discussed above?
 - One of the easiest places is Morningstar which you have already used
 - Go to Risk and you can choose 3-year, 5-year and 10-year
 - Determine your period: 3-, 5-, 10-, 15-year
 - Review the relevant statistics on the next page (color coded)
 - Sharp Index
 - Treynor Measure
 - Note: With a little help you can calculate the
 - Jensen's Alpha

Risk Adjusted Performance (continued)

Jensen's Alpha:

- These are not as good as they were before. Roughly, if the Fund has a higher alpha than the Index, it has outperformed. Since its alpha is $-.02$ and the index is $-.17$, the alpha of the fund versus the index is $.15\%$ ($-.01 - (-.17)$)

Treynor:

- Assume a risk-free rate of 0.5% . It is the return on the portfolio – the risk free rate divided by the standard deviation. Do this for the market as well.

Risk & Volatility Measures ⓘ

Trailing	Fund	Category	Index
Alpha	-0.02	-1.69	-0.17
Beta	1.00	0.98	1.01
R ²	100.00	94.54	99.85
Sharpe Ratio	0.65	0.51	0.64
Standard Deviation	13.16	13.34	13.25

Fund as of Feb 29, 2020 | Category: Large Blend as of Feb 29, 2020 | Index: Russell 1000 TR USD as of Feb 29, 2020 | Calculation Benchmark: S&P 500 TR USD



Risk Adjusted Performance (continued)

- Which measure is most appropriate? Are there some general guidelines?
 - Generally, if the portfolio represents the entire investment for an individual, the Sharpe Index compared to the Sharpe Index for the market is best
 - If many alternatives are possible, or if this is only part of the overall portfolio, use the Treynor measure versus the Treynor measure for the market, or the Jensen's α alpha
 - Of these two, the Treynor measure is more complete because it adjusts for risk



Risk Adjusted Performance (continued)

- Are their limitations of risk adjustment measures?
 - Yes, very much so. The assumptions underlying measures limit their usefulness
 - Know the key assumptions and be careful!
 - When the portfolio is being actively managed, basic stability requirements are not met
 - Be careful when portfolios are actively managed
 - Practitioners often use benchmark portfolio comparisons and comparisons to other managers to measure performance
 - This is largely because they are easier



Risk Adjusted Performance (continued)

- What about style analysis?
 - Another way of obtaining abnormal returns is chasing style
 - Growth versus value—what's hot?
 - You can decompose returns by attributing allocation to style
 - Style tilts and rotation are important active portfolio strategies
 - Style analysis has become increasingly popular in the industry



Questions

- Any questions on risk-adjusted performance measures?



D. Setting Up an Investment Account

- There are many different ways to set up an investment account
 - You can do this with a mutual fund company, a bank, or other financial services company
 - Remember one key objective is to minimize costs including transactions costs and taxes
 - Generally, I select which no-load mutual funds I want to purchase first, and then go directly to the mutual fund company or brokerage house and purchase the mutual fund shares through them
 - I make sure the mutual fund company is Quicken compatible so I can use Quicken to update my holdings and track changes



Setting Up an Account (continued)

- There are four parts to setting up an online account:
 - 1. Select your Account Type
 - Is this for retirement or for general investing?
 - If retirement, is it a Roth or traditional IRA, SEP or SIMPLE?
 - If general investing, what kind of securities will you be investing in?
 - Mutual funds, stocks, bonds, ETFs
 - Once you have your type, you will need your social security number, your birth date, email address, and your home address to begin filling out the forms



Setting Up an Account (continued)

- 2. Select your investments
 - Here is where you select from the available mutual funds and other assets from the mutual fund company
 - Make sure you have sufficient funds for the initial investment
 - Check to see if they charge for accounts under a certain dollar amount of assets
 - Make sure you have enough for the minimum purchase amount or agree to the Automatic Investment Program
 - Select the funds and the dollar amounts



Setting Up an Account (continued)

- 3. Select your funding method
 - How will you get your money to the mutual fund company or brokerage account
 - A. Write a check
 - You can write a check and mail it in
 - B. Electronic bank transfer
 - You can give them your bank account number and your bank routing number, and they can take the money out of your account
 - C. Bank wire
 - You can have your bank wire the funds to the mutual fund company (more expensive)



Setting Up an Account (continued)

- 4. Review and finalize your information
 - Review your information for correctness
 - Electronically sign or print your application
 - Sign up for online access
 - Prepare to connect to the mutual fund company through Quicken or other program to monitor account and individual asset performance



Setting Up an Account (continued)

- Once you have done these things, you are set up (initially). Now:
 - Set up Quicken or other program to track your mutual funds by asset class each week
 - Watch your investment asset allocation to make sure you are within your target percentages
 - If it is not an index fund, make sure you can compare performance versus benchmarks each quarter and each year to make sure the mutual fund managers are adding value (i.e., performing better than the benchmarks after costs and fees)



Setting Up an Account (continued)

- What are the criteria for choosing a mutual fund company?
 - Do they have the lowest fees, in sales charges (loads) and expense ratios (12b-1 and management fees)? There are funds with 0% expense ratios
 - Do they charge fees if you do not have a specific amount invested with them? (If you have less than \$10,000 with Vanguard, there is a quarterly fee)
 - Do they have high minimum balances, which is the minimum you can put in to invest? (Vanguard's minimum balance is \$3,000 unless you do an automatic investment program (AIP). Schwab is \$0)



Questions

- Any questions on setting up an account?



Review of Objectives

- A. Do you understand portfolio rebalancing?
- B. Do you understand the Importance of Portfolio Management and Performance Evaluation?
- C. Do you understand risk-adjusted performance measures?
- D. Do you understand how to set up an account with a mutual fund company/brokerage house?



Case Study #1

Data

- Steve and Suzie, both 45, are aggressive investors, and have a portfolio of over \$250,000. Their target asset allocation is 60% equities and 40% bonds and cash which they have invested in 10 mutual funds. Their actual asset class weights are different from their targets due to the out-performance of the equity part of their portfolios.

Asset Class	Actual Weight	Target Weight	Difference
Equity	70%	60%	10%
Bonds	20%	30%	-10%
Cash	10%	10%	0%

Application: When should they rebalance their portfolio and how should they do it effectively (including costs and taxes)?₄₃



Case Study #1 Answers

- The decision of when to rebalance should be part of their Plan. They need to determine the best time and the most cost effective means (i.e., minimize transactions costs, taxes and tracking error)
 - They could use the “New Money/Donation” (NMD) strategy. Use new money to buy underweight asset classes. If this is insufficient, then donate appreciated assets to rebalance in taxable accounts. Since this change is due to appreciation of equities, they will donate the appreciated equity assets, then take the money they would have spent on their charity and purchase more bonds (See [Tithing Share Transfer](#) (LT08)) thereby rebalancing their portfolio efficiently



Case Study #2

Data

- Steve is reviewing the performance of his largest asset, the actively managed Fidelity Magellan Fund (FMAGX) for the most recent 3 and 5 year periods (ending 3/14/2017). The T-bill or risk free rate proxy during the period was 0.8%.

	3 Year		5 Year	
	FMAGX	SPX	FMAGX	SPX
Average return	9.4%	6.5%	13.1%	13.5%
Beta	1.08	1.0	1.06	1.0
Std. Deviation	9.8%	9.2%	11.4%	10.4%

Calculations and Application

- A. Calculate Sharpe $((r_p - r_f) / sd_p)$, Treynor $((r_p - r_f) / \beta_p)$, and Jensen $(r_p - [r_f + \beta_p (r_m - r_f)])$ measures for the 3 & 5 year periods
- b. On a risk-adjusted basis, did it outperform the market?
- c. Which risk-adjusted measure should Steve use?



Case Study #2 Answers

	3 Yr-FMAGX	SPX	5-Yr FMAGX	SPX
• Average return	9.4%	6.5%	13.1%	13.5%
• Beta	1.08	1.00	1.06	1.00
• Std. Deviation	9.8%	9.2%	11.4%	10.4%
• T-Bill rate	0.8%			

a. Performance measures

Sharpe = $(r_p - r_f) / sd$ 3 Year 5 Year

- Portfolio $(9.4-.8)/9.8 = .88$ 1.08
- Market $(6.5-.8)/9.2 = .62$ 1.22

Treynor = $(r_p - r_f) / \beta_p$

- Portfolio $(9.4-.8)/1.08 = .08$.12
- Market $(6.5-.8)/1.0 = .06$.13

• Note: for the purpose of being consistent, please use whole percentage numbers instead of the decimal



Case Study #2 Answers

	3 Yr-FMAGX	SPX	5-Yr FMAGX	SPX
• Average return	9.4%	6.5%	13.1%	13.5%
• Beta	1.08	1.00	1.06	1.00
• Std. Deviation	9.8%	9.2%	11.4%	10.4%
• T-Bill rate	0.8%			

$$\text{Jensen's alpha} = r_p - [r_f + \beta_p (r_m - r_f)]$$

- 3 Year Alpha = $9.4 - [.8 + 1.08 (6.5-.8)] = 2.4\%$
- 5 Year Alpha = $13.1 - [.8 + 1.06 (13.5-.8)] = -1.2\%$

b. Steve's Fund risk adjusted performance:

	3 Year	5 Year
• Sharpe Ratio	.88 vs .62 (Y)	1.08 vs 1.22 (N)
• Treynor measure	.08 vs .06 (Y)	.12 vs .13 (N)
• Jensen's Alpha	2.4% (Y)	-1.2% (N)



Case Study #2 Answers

- c. Which measure is most appropriate?
 - Generally, if the portfolio represents the entire investment for an individual, the Sharpe Index compared to the Sharpe Index for the market is best. This is not the case here.
 - If many alternatives are possible, or if this is only part of the overall portfolio, use the Treynor measure versus the Treynor measure for the market, or the Jensen's alpha
 - Of these two, the Treynor measure is more complete because it adjusts better for risk



Case Study #3

Data

- You have five mutual funds in your portfolio, an emergency bond fund (VIPSX), a large cap index fund (SWPPX), a small cap fund (FSCRX), an emerging markets fund (SSEMXX), and a REIT (VGSIX). How have they done versus their benchmarks (or categories) over the past three years?

Calculations

- Using the data from Morningstar at the BYU Library, type in the ticker and go to the Risk tab for each fund. Look at their 3 year performance versus their categories (as a proxy for the market). Did they outperform their benchmarks?
 - Did these funds outperform over the past three years on a risk-adjusted basis?

Case Study #3 Data

MPT Statistics VIPSX

3-Year	5-Year	10-Year	15-Year				
3-Year Trailing		Index	R-Squared	Beta	Alpha	Treynor Ratio	Currency
vs. Best-Fit Index							
VIPSX		BBgBarc US Treasury US TIPS TR USD	98.47	1.03	-0.18	—	USD
vs. Standard Index							
VIPSX		BBgBarc US Agg Bond TR USD	65.65	0.95	-0.48	0.08	USD
Category: IP		BBgBarc US Agg Bond TR USD	49.60	0.79	-0.42	0.17	USD
02/28/2018							

MPT Statistics SWPPX

3-Year	5-Year	10-Year	15-Year				
3-Year Trailing		Index	R-Squared	Beta	Alpha	Treynor Ratio	Currency
vs. Best-Fit Index							
SWPPX		S&P 500 TR USD	100.00	1.00	-0.06	—	USD
vs. Standard Index							
SWPPX		S&P 500 TR USD	100.00	1.00	-0.06	10.54	USD
Category: LB		S&P 500 TR USD	91.04	0.98	-1.53	8.88	USD
02/28/2018							

Volatility Measures VIPSX

3-Year	5-Year	10-Year	15-Year				
3-Year Trailing		Standard Deviation	Return	Sharpe Ratio	Sortino Ratio	Bear Market Percentile Rank	
VIPSX							
Bloomberg Barclays US Aggregate Bond TR USD		2.68	1.14	0.23	0.33	—	
Category: IP		3.11	0.57	0.04	0.07	—	
02/28/2018							

Volatility Measures SWPPX

3-Year	5-Year	10-Year	15-Year				
3-Year Trailing		Standard Deviation	Return	Sharpe Ratio	Sortino Ratio	Bear Market Percentile Rank	
SWPPX							
S&P 500 TR USD		10.16	11.14	1.04	1.89	—	
Category: LB		10.47	9.21	0.85	1.48	—	
02/28/2018							

Case Study #3 Data

MPT Statistics FSCRX

	3-Year	5-Year	10-Year	15-Year						
3-Year Trailing					Index	R-Squared	Beta	Alpha	Treynor Ratio	Currency
vs. Best-Fit Index										
FSCRX					Morningstar US Small Cap TR USD	90.13	0.89	-0.80	—	USD
vs. Standard Index										
FSCRX					S&P 500 TR USD	50.49	0.85	-3.08	6.31	USD
Category: SB					S&P 500 TR USD	54.93	0.97	-2.81	7.15	USD

02/28/2018

MPT Statistics SSEMX

	3-Year	5-Year	10-Year	15-Year						
3-Year Trailing					Index	R-Squared	Beta	Alpha	Treynor Ratio	Currency
vs. Best-Fit Index										
SSEMX					Morningstar EM GR USD	95.18	0.86	-5.73	—	USD
vs. Standard Index										
SSEMX					MSCI ACWI Ex USA NR USD	78.20	0.99	-3.85	1.48	USD
Category: EM					MSCI ACWI Ex USA NR USD	72.60	1.03	1.69	7.12	USD

02/28/2018

Volatility Measures FSCRX

	3-Year	5-Year	10-Year	15-Year					
3-Year Trailing					Standard Deviation	Return	Sharpe Ratio	Sortino Ratio	Bear Market Percentile Rank
FSCRX					12.19	5.92	0.49	0.85	—
S&P 500 TR USD					10.16	11.14	1.04	1.89	—
Category: SB					13.36	7.37	0.56	0.97	—

02/28/2018

Volatility Measures SSEMX

	3-Year	5-Year	10-Year	15-Year					
3-Year Trailing					Standard Deviation	Return	Sharpe Ratio	Sortino Ratio	Bear Market Percentile Rank
SSEMX					14.02	2.01	0.17	0.26	—
MSCI ACWI Ex USA NR USD					12.46	6.24	0.51	0.80	—
Category: EM					15.13	7.90	0.54	0.90	—

02/28/2018

Case Study #3 Data

MPT Statistics VGSIX

3-Year	5-Year	10-Year	15-Year						
3-Year Trailing				Index	R-Squared	Beta	Alpha	Treynor Ratio	Currency
vs. Best-Fit Index									
VGSIX				S&P United States REIT TR USD	99.86	0.99	0.00		USD
vs. Standard Index									
VGSIX				MSCI ACWI NR USD	24.13	0.63	-4.75	-0.96	USD
Category: SR				MSCI ACWI NR USD	29.19	0.64	-4.41	0.23	USD

02/28/2018

Volatility Measures VGSIX

3-Year	5-Year	10-Year	15-Year					
3-Year Trailing				Standard Deviation	Return	Sharpe Ratio	Sortino Ratio	Bear Market Percentile Rank
VGSIX				13.78	-0.07	0.02	0.03	—
MSCI ACWI NR USD				10.83	8.34	0.75	1.22	—
Category: SR				12.94	0.48	0.07	0.12	—

02/28/2018



Case Study #3 Answers

- We will use the category as the proxy for the market (as of March 12, 2018)

Name	3 Year		Outperformed*			
	Sharpe	Category	Treynor	Category	Sharpe	Treynor
VIPSX	.62	.57	.08	.17	Yes	No
SWPPX	1.04	1.04	10.54	8.88	Yes	Yes
FSCRX	.49	.56	6.31	7.15	No	No
SSEMIX	.17	.54	1.48	7.12	No	No
VGSIX	.02	.07	-.96	.23	No	No