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THE LAZY PORTFOLIO: AN EMPIRICAL ANALYSIS OF THE RISK-RETURN
CHARACTERSITICS OF STATIC INVESTMENT PORTFOLIOS

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ABSTRACT

This paper examines the risk-adjusted profitability of several "lazy" portfolios recommended by well-known portfolio managers. A lazy portfolio constitutes simple combinations of asset classes that serve the purpose of needing little attention and appeal to the average retail investor. Primarily using Vanguard Index Funds, I construct these portfolios and apply simple investment performance metrics. This paper uses the Sharpe ratio, regression analysis, and the construction of efficient frontiers to rank and study the various portfolios. The study found that Harry Browne's Permanent Portfolio significantly outperformed the set of examined portfolios. Given the results from Harry Browne's permanent portfolio, I also discuss the financial implications of gold as a safe haven asset.

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The Lazy Portfolio

The lazy portfolio is a concept that involves a static portfolio allocation to a specific number of asset classes. These portfolios appeal to the novice investor, in that the allocation can be created and left alone after the initial investment (with occasional portfolio weight rebalancing). In today's financial markets, one can easily invest in mutual funds or ETF's that follow the performance of any number of different asset classes (from small-cap value equity to real estate investment trusts). The lazy portfolio enables investors to evade management fees charged by active portfolio managers for their purported outperformance. In an environment in which hedge funds returned an average of 6.2% in 2012, many investors are arguably seeking simplified, inexpensive investment strategies (Farrel, 2013).

Novice investors are capable of creating their own portfolios without enlisting the help of professional portfolio managers. The key question involves whether or not a lazy portfolio can be a viable investment solution for the average investor. Many financial services industry professionals have recommended their own versions of lazy portfolios, all of which have varying asset allocations and weightings. By examining the historical performance of different lazy portfolios, we will get an indication of how these portfolios perform relative to each other, and also how they perform in a severe economic downturn (2007-2009 Recession). These findings will provide a body of research that summarizes the risk-adjusted returns of the different portfolios, so that investors may understand the portfolios' basic investment characteristics.

There are many asset classes to choose from in today's financial markets, and these asset allocation decisions will change over time depending on the investor's time horizon. It is commonplace for younger investors to focus on an equity orientation in their portfolios, while older investors tend to focus on fixed income products. Since the 1960s, a relatively new

development in the world of retail investing has been the ability to take positions in real estate assets, via real estate investment trusts (REITS). Income-producing REITs boast moderate correlation to other common asset classes (stocks, bonds, cash) and are an important diversification tool to investors (Wechsler, 2013). Commodities such as gold, silver, timber, crude oil and platinum often find their way into investor portfolios as well. This asset class can function as an inflation hedge and can contribute significantly to portfolio diversification.

  Gold will be examined further as an investment option in a lazy portfolio. A portfolio containing this hard asset warrants more study because of its modern day perception as a safe haven vehicle and its lack of fixed payments. Can this commodity continue to support investors that desire stability in their nest egg, or is this historically volatile asset too dangerous to invest in in the future?

Literature Review

To understand the purpose of suggesting a lazy portfolio, I summarize existing literature on active vs. passive investing. Utilizing books and articles written by the investment professionals, an examination of each expert's lazy portfolio recommendation will be discussed at length, so that the rationale for their asset allocation is clear. As a result of significant findings regarding the returns to gold, I also conduct a brief literature review of gold in the financial markets.

Active vs. Passive Investing

The passive investment portfolio is synonymous with the lazy portfolio. It is a simple, static asset allocation which may be rebalanced from time to time. It is contrary to the actively managed portfolio, in which professionals attempt to outperform a benchmark, and charge higher fees as a result.

In one study, Fortin and Michelson (1999) conduct a large scale analysis of passive vs. active funds over a 1, 3, 5, 10, and 15 -year time period (the 15-year time period ranges from 1981-1995). The authors compare active funds in seven broad investment categories to well-known indexes, and examine the results for indications of outperformance[1]. Using a paired comparison t-test, they ultimately find that passive indexes tend to significantly outperform active funds, even when transaction costs are taken in to account. Interestingly, it is found that actively managed small-cap equity funds outperform passive indexes. The authors conclude that passive indexing is a viable investment strategy. This is attributed to inefficiencies in the small-cap equity market, which allow active managers to seek out excess return via extensive due diligence (Fortin & Michelson, 1999).

The controversial active vs. passive argument is one that is still widely debated. Nevertheless, the ability of passive investment portfolios to remain viable investment strategies raises an interesting question. What is the most intelligent way for a novice, independent investor to allocate across asset classes and across time? This notion is discussed next.

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[1] In general these funds fall into the following categories: Aggressive Growth and Growth, Growth/Income and Equity/Income, Small Company Equity, International Stock, Corporate Bond, Government Bond, and Municipal Bond

Allan Roth

Allan Roth is financial services industry veteran that worked for McKinsey & Company and is a current honorarium finance faculty member of the University of Colorado. He advocates that individual investors can manage money in a non-emotional, logical fashion like corporations tend to do ("Allan Roth," 2012).

In Allan Roth's *How a Second Grader Beats Wall Street: Golden Rules Any Investor Can Learn*, he discusses a portfolio so simple that he likens its simplicity to that of second grader's intelligence level. Roth encourages a portfolio that utilizes low costs (low expense ratio funds), tax efficiency, one in which the holder controls his or her emotions, and strategic tax location. The general intuition behind Roth's theory is that expenses paid to active portfolio managers' decrease the annual return to an investor's portfolio, and thus significantly reduce the compounding effect that could be achieved over a long time horizon. His second grader equation is 10 – 2 = 8. This juvenile equation intends to get across the point that an annual return of 10 percent is decreased by 2 percent on average if an investor utilizes active portfolio management (A. Roth, 2009).

According to Roth, the savings associated with a deduction of 0.25% in expenses allows investors to reach their financial goals a year sooner on average. This is such a marked effect because of compounding of returns over a long period of time. Roth cites a paper from William Sharpe's The Arithmetic of Active Management, which stated "Properly measured, the average actively managed dollar must underperform the average passively managed dollar, net of costs". Clearly, Roth believes that a portfolio compiled from low expenses funds is the optimal strategy (A. Roth, 2009). His recommendation includes a simple asset allocation of:

Figure 1-1: Allan Roth Allocation

60% U.S. stock market (VTSMX)[2]
30% International stock market: (VGTSX)
10% Bond Market: 10% (VBMFX)

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[2] See Appendix for full description of Vanguard Indexes.

David Swensen

David Swensen joined Yale as the Chief Investment Officer in 1985, where he is responsible for managing the university's $16 billion endowment fund. Prior to his employment at Yale, he worked on Wall Street for Solomon Brothers, where he is said to have had engineered the first swap transaction ("David F. Swensen", 2013).

In the book *Unconventional Success: A Fundamental Approach to Personal Investment,* David Swensen lays out his thoughts on core asset classes and portfolio diversification. Swensen argues that diversification mechanically requires that an asset weighting be large enough to impact the portfolio, but not large enough to matter too much. According to the math of diversification, this implies a lower bound of a 5% weight in any asset class and an upper bound of a 30% weighting in any asset class. Swensen also promotes that an equity orientation in a portfolio is optimal, as this broad asset class drives the results of long-term investment portfolios. This extra return associated with equity investments is traded off with fixed income and real estate assets to protect against economic crises, as well as inflationary and deflationary environments (Swensen, 2005).

From a functional diversification standpoint, Swensen recommends six core asset classes to achieve investment success. The aforementioned favored equity allocation is the main driver of long-term investment results. Swensen also suggests Treasury Inflation-Protected Securities (TIPS) and real estate as tools to protect against the threat of inflation. Intermediate government bonds provide protection against deflation and financial crises as a flight to safety would benefit this asset class (Swensen, 2005). Overall, Swensen advocates the following asset allocation in his reference portfolio

Figure 1-2: David Swensen Allocation

Domestic equity: 30% (VTSMX)
Foreign developed equity: 15% (VGTSX)
Emerging market equity: 5% (VEIEX)
Real Estate: 20% (VGSIX)
U.S. Treasury Bonds: 15% (VBIIX)
U.S. TIPS: 15% (VIPSX)

Rick Ferri

Rick Ferri is a Wall Street alumnus that unwaveringly supports the concept of low cost indexing, a philosophy that he developed following his tenure at financial firms such as Kidder, Peabody & Co. and Smith Barney. He left Wall Street and founded Portfolio Solutions, a company that embodies his investment ideology. Ferri is regarded as a top expert on low cost index investing ("About Rick", 2011).

Rick Ferri's investment style follows the logic that minimizing cost maximizes return. He is a fundamental believer in low cost investment vehicles such as ETFs and index funds; he and Vanguard founder John Bogle have much in common relating to investment rationales. In a Bogleheads Forum, Ferri (2007) states, "You only need a few asset classes in your portfolio, and after that there are diminishing returns. The mutual funds you choose to represent those asset classes should be the lowest cost funds you can buy." This thought process mimics that of Allan Roth, in that Ferri has more to say about keeping costs low and less about asset allocation decisions. A portfolio recommended by Rick Ferri includes the following asset allocation:

Figure 1-3: Rick Ferri Allocation

36% Stock Market (VTSMX)
18% International Stock Market (VGTSX)
6% REIT (VGSIX)
40% Bond Market (VBMFX)

From his recommendation it is clear that Ferri is in favor of investment in broad asset classes, with the main focus being on keeping costs low (Ferri, 2011).

Bill Schultheis

Bill Schultheis began his career working for Smith Barney, and eventually left and started his career as an investment author. He wrote books and newspaper columns with simple investment advice, with the goal of helping the average investor succeed in managing wealth and he later became a principal at Soundmark Wealth Management ("About Bill", 2013).

In Bill Schultheis's book, *The New Coffeehouse investor: How to build wealth, Ignore Wall Street, and Get on with Your Life*, the author lays out basic investing principles that he believes everyone should follow. The first is the idea of not putting your eggs in one basket, allowing investors to achieve financial goals while minimizing risk. Schultheis also states that there is no free lunch when it comes to investing, and that trying to beat the market in the long run will lead to poor results (because of efficient markets). Lastly, he maintains that the investor should "save for a rainy day", because it is essential to monitor saving and spending levels in order to reach long-term goals. (Schultheis, 2005). In an effort to achieve proper diversification, Schultheis lays out the following asset allocation:

Figure 1-4: Bill Schultheis Allocation

10% U.S. Stock Market (VTSMX)
10% Value Stocks (VIVAX)
10% Small Cap Stocks (NAESX)
10% U.S. Small Cap Value (VISVX)
10% International Stock Market (VGTSX)
10% REITS (VGSIX)
40% Bond Market (VBMFX)

His allocation contains the most asset classes of the portfolios examined in this paper. This investment ideology conflicts with Rick Ferri's statement about diminishing returns occurring as more and more asset classes are added to a portfolio. It will be interesting to compare the results of the two portfolios.

Harry Browne

Harry Browne was a libertarian politician as well as an investment advisor. He was also a prolific writer, and even ran for the president of the United States under the libertarian party in 1996 and 2000 ("About Harry Edson Browne," 2013). He suggests what he calls a "Permanent Portfolio", designed to provide stable returns throughout all market environments (J. Roth, 2009). The money that an investor allocates to a permanent portfolio is money that cannot afford to be lost, as opposed to money the investor can afford to lose. The permanent portfolio is meant to provide capital preservation and modest returns in various economic environments. To accomplish this, Browne suggests to investors an equally weighted allocation to stocks for times of prosperity, cash during a recession, gold for inflationary environments, and treasuries for deflation. Simply enough, Browne recommends the following weights

Figure 1-5: Harry Browne Allocation

25% Stocks (VTSMX)
25% Cash[3]
25% Gold[4]:
25% Long-Term Treasuries (VBLTX)

Rebalancing should occur when any one of the asset classes exceeds 35% or falls below 15%. This portfolio stands out in the sense that it is the only one with an allocation to a precious

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[3] See section on data selection

[4] Absent an ETF dating back to the relevant time period, the historical spot price of gold as reported from FactSet is used, and a return is generated.

metal. Precious metals are particularly attractive in times of market panic, as seen during the 2008 financial crisis (J. Roth, 2009).

These types of portfolios have become popular in the fund industry. In fact, the Permanent Portfolio Family of Funds offers similar version of a permanent portfolio. This portfolio includes gold, silver, Swiss franc assets, stocks of foreign real estate and natural resource companies, aggressive growth stocks, and dollar assets with the same goal is in mind as Harry Browne: maximizing return and investment stability ("Strategy", 2012).

William Bernstein

A former chemist and doctor, William Bernstein entered into the investment field in a manner quite different than the other experts in this analysis. Although he had no previous experience on Wall Street, Bernstein quit as a practicing neurologist and decided to pursue his passion of financial theory. He runs the website Efficientfrontier.com, and has published a number of highly popular investment books ("William Bernstein", 2012).

In *The Four Pillars of Investing*, William Bernstein lays out the main themes to his perspective on the investing world. These themes comprise what his deems the "four pillars of investing". The first pillar is *theory*, in which Bernstein discusses integral pieces of finance theory such as the relationship between risk and return and proper diversification. Bernstein describes his second pillar, *history*, in a clever way. He asserts that the discipline of finance is a social science, as opposed to a hard science (such as engineering). In a hard science, laws and equations tend not to deviate from what the theory says. Because of this, an engineer lacking an in depth understanding of engineering history does not stand to suffer from this. In finance, however, a lack of understanding of the past will leave the financier "irretrievably handicapped", according to Bernstein. *Psychology*, also known as behavioral finance, plays a role in investing in Bernstein's mind. Investor attempts to time the market and incur numerous transaction costs can bring detriment to investment returns. Lastly, *business* is a factor working against the investor's goals. Bernstein quite bluntly stresses the financial services industry's end game: to accumulate as many fees and commissions from the investor. Bernstein, like the previous portfolio managers, advocates that investors remove themselves from the grip of stockbroker's and predatory lenders (Bernstein, 2010). With these pillars in mind Bernstein recommends the following allocation to investors with long time horizons:

Figure 1-6: William Bernstein Allocation

25% U.S. Stock Market (VTSMX)
25% U.S. Small Cap Equity (NAESX)
25% International Stock Market (VGTSX)
25% U.S. Bond Market (VBMFX)

A Word on Gold

Gold has been one of the most interesting assets to follow in the past decade. It is of particular importance to this paper as it was the key driver of returns for Harry Browne's permanent portfolio. The price of gold is affected by a multitude of factors, but it can be separated in to two main drivers: macroeconomic factors and supply and demand. Often pundits utilize these drivers when describing the future direction of gold prices. On the macroeconomic side, we see global currencies, inflation concerns, national debt levels, trade flow imbalances and Federal Reserve activity affecting gold prices (The Wall Street, T. C, 2004). Certainly, the above factors have had a dramatic influence of the price of gold in the past decade. Gold has a safe-haven characteristic, so that people allocate money towards gold when they are pessimistic about the financial system. In addition, gold is also obviously impacted by the supply and demand of the commodity. The ability to continue to mine and supply the finite resource in the market is also a key factor on its price behavior. Gold has proven to be a powerful diversifying asset. This will become apparent when examining Harry Browne's portfolio's correlation to the overall market, or its beta.

Data Selection

In general, proxies for asset classes are taken from Vanguard's family of funds. For example, Vanguard Inflation-Protected Securities (VIPSX) was used as a proxy for TIPS. Historical monthly prices from the time period 2000-2012 were taken from Yahoo Finance. The risk-free rate for the Sharpe ratio calculation is found by computing an average of the 3-month Treasury bill yield, as reported from the St. Louis Federal Reserve. As Vanguard does not publish return data for money market funds, the proxy for cash in Harry Browne's portfolio is the average one-month yield on T-Bills from CRSP. These returns have a .99 correlation with risk-free rates of return published by Ken French, so it is a suitable representation of the historical return on cash.

Methodology

The lazy portfolios are constructed according to the aforementioned weights over a 12, 5, 3 and 1-year period. Returns are continuously compounded to allow the incremental returns to be added together to reach the various holding period returns. Portfolios are not rebalanced (although some of the sample portfolio managers recommend this) so that the analysis is consistent throughout the study. The goal of this paper is to analyze the risk-adjusted performance each expert's lazy portfolio. To accomplish this, I will calculate a Sharpe ratio to rank the different portfolios. The appropriate equation here is:

Figure 1-7: Sharpe Ratio

Equation: $$S = \frac{R_i - Rf}{\sigma_i} \qquad (1)$$

Where: S = Sharpe Ratio
R_i = Excess Return on Asset
Rf = Risk Free Asset
σ_i = Asset Standard Deviation

To examine the lazy portfolios further, the excess returns will be benchmarked against the total market return for 12-year and 3-year time period, to see if the portfolios generate abnormal returns over the specified time period. I use this particular benchmark under the assumption that it is the next best alternative investment to a lazy portfolio. Most importantly, this analysis will provide an indication of the portfolios' betas, or their risk relative to the overall market.

In addition, I will construct an efficient frontier for each portfolio of a period of 12 years of monthly returns, using MATLAB. The risk-return space shows the efficient frontiers for each managers' asset allocation decision, as well as the risk and return for each individual asset. These efficient frontiers will provide a visual framework to view the risk-return characteristics of the different portfolios.

Results

From the resulting analysis, we can see the varying performance of the portfolio managers' asset allocation recommendations across time. Below in Figure 1-2, we see the Sharpe ratio rankings over the examined time periods:

Figure 1-8: Sharpe Ratio Rankings

3 year (2009-2012)		1 year (2011-2012)	
Harry Browne	0.44787	Harry Browne	0.29495
Bill Schultheis	0.17240	Bill Schultheis	0.22999
David Swensen	0.16855	Rick Ferri	0.18156
Rick Ferri	0.14080	William Bernstein	0.16755
William Bernstein	0.12790	Allan Roth	0.16341
Allan Roth	0.11131	David Swensen	0.13933

Note that the 12-year and 5-year time periods have been excluded from the analysis, as they generated negative Sharpe ratios. A negative Sharpe ratio indicates that the risk-free rate of return outperformed the portfolios over the analyzed time period. Nonetheless, the time periods in Figure 1-2 provide valuable insight into the performance of the lazy portfolios in an economic recovery. It is clear that Harry Browne's Permanent Portfolio outperforms all other competing portfolio managers. This finding is not incredibly surprising as gold delivered record returns in the past decade. It does, however, provide evidence of gold's property as the ultimate fear-asset. When markets are in turmoil, people appear to trust in hard assets. Allan Roth's portfolio appears to be the worst performing portfolio, relative to the others. His portfolio contains the least amount of asset classes (3), so perhaps the lack of benefit to diversification is negatively impacting the portfolio's Sharpe ratios (larger standard deviation of returns). Interestingly, Bill Schultheis is consistently in second place during these two time periods. His portfolio contained the most asset classes (7) in the study. It is possible that the decision to invest in seven separate asset classes

aided Schultheis in capturing the free lunch benefits to diversification, reducing overall portfolio standard deviation, and generating a higher Sharpe ratio.

The regression results for the 12-year period (See appendix A) indicate that the only portfolio that generated a statistically significant return over the S&P 500 was Harry Browne. All other portfolios did not generate abnormal returns over the 12-year time period. Not surprisingly, Harry Browne's portfolio also had the lowest beta, meaning its returns were unrelated to market returns. Other notable low beta portfolios over the 12-year time period include Bill Schultheis and Rick Ferri's portfolios. These previously discussed portfolios were at odds with each other, in terms of how many asset classes that they allocated their money towards. Nonetheless, Bill Schultheis and Rick Ferri developed allocations that carried betas of .63 and .60, respectively.

The regression results for the 3-year time period (See appendix B) are similar to the 12-year results. One interesting finding is that the beta figure for Harry Browne's portfolio is not statistically significant (not different than zero). Despite this, Harry Browne's portfolio again generated the only statistically significant return in this instance.

The efficient frontier construction via MATLAB provides a visual insight into the risk-return characteristics of each portfolio. Appendices C through H show the frontiers of each portfolio along with the average monthly return and risk of each individual asset. Notably we can see in Appendix G that the gold portion of Harry Browne's Portfolio devliered a strong monthly average return, with about the same volatility as the U.S. Stock Market. A glance at Appendix F shows that the Vanguard Small Cap Value Index delivered a higher return with lower volatility than Vanguard Small Cap Index. Appendix F also shows the high return generation of REITs, as well as high volatility. This is an asset class often assumed to be in the middle of stocks and bonds in terms of the risk and return (Swensen, 2005). This volatiliy is most likely attributtable to the mass fluctuations in housing prices in the latter half of the decade examined.

Conclusion

This paper set out to view the risk-return characteristics of lazy portfolios. It also compared the risk-adjusted performance of the portfolios and performance relative to the U.S. stock market. The results presented give investors an idea what to expect in developing their own portfolios, based on the previous decade's data. Note that this study used data over a 12-year period only and is subject to the time-period specific nature of the results.

One of the key issues raised here was the viability of gold as a safe-haven asset. Clearly, those with a gold orientation in the past decade have benefited greatly from its characteristics as a safe haven. In light of this, an interesting question arises regarding gold's long term role as a fear-based asset. Harry Browne's portfolio delivered superior performance and exhibited very low correlation to the market during the financial crisis of 2008. This is a direct result of gold comprising a significant portion of the portfolio. Can investors continue to rely on this volatile asset? This item warrants further research.

With financial technology evolving rapidly, prototypical asset managers and hedge funds stand to lose as investors improve their knowledge of the financial markets. Retail investors with a computer, some investable cash, and a basic understanding of diversification can emerge as winners even in acute financial crises.

Appendix A

Regression Results for Lazy Portfolios against S&P 500 (12-year)

	α	β	Sample
Allan Roth	0.000937	0.941244**	145
	(0.000737)[5]	(0.015785)	
	α	**β**	Sample
David Swensen	0.002298	0.748154**	145
	(0.001274)	(0.000783)	
	α	**β**	Sample
Rick Ferri	0.000711	0.601876**	145
	(0.000678)	(0.01401)	
	α	**β**	Sample
Bill Schultheis	0.00171	0.637335**	145
	(0.000973)	(0.020883)	
	α	**β**	Sample
Harry Browne	0.004274**	0.196904**	145
	(0.001162)	(0.024878)	
	α	**β**	Sample
William Bernstein	0.001407	0.81349**	145
	(0.000845)	(0.018126)	

[5] The values in parentheses represent standard error.

Appendix B

Regression Results for Lazy Portfolios against S&P 500 (3-Year)

|	α	β	Sample
Allan Roth	-0.002516	0.986005**	36
	(0.001300)	(0.028254)	
	α	**β**	Sample
David Swensen	0.001144	0.769073**	36
	(0.001807)	(0.039261)	
	α	**β**	Sample
Rick Ferri	-0.000047	0.638255**	36
	(0.001126)	(0.024483)	
	α	**β**	Sample
Bill Schultheis	0.000852	0.658171**	36
	(0.001229)	(0.026704)	
	α	**β**	Sample
Harry Browne	0.007297**	0.087126	36
	(0.002337)	(0.050777)	
	α	**β**	Sample
William Bernstein	-0.001445	0.854791**	36
	(0.001345)	(0.029232)	

Appendix C

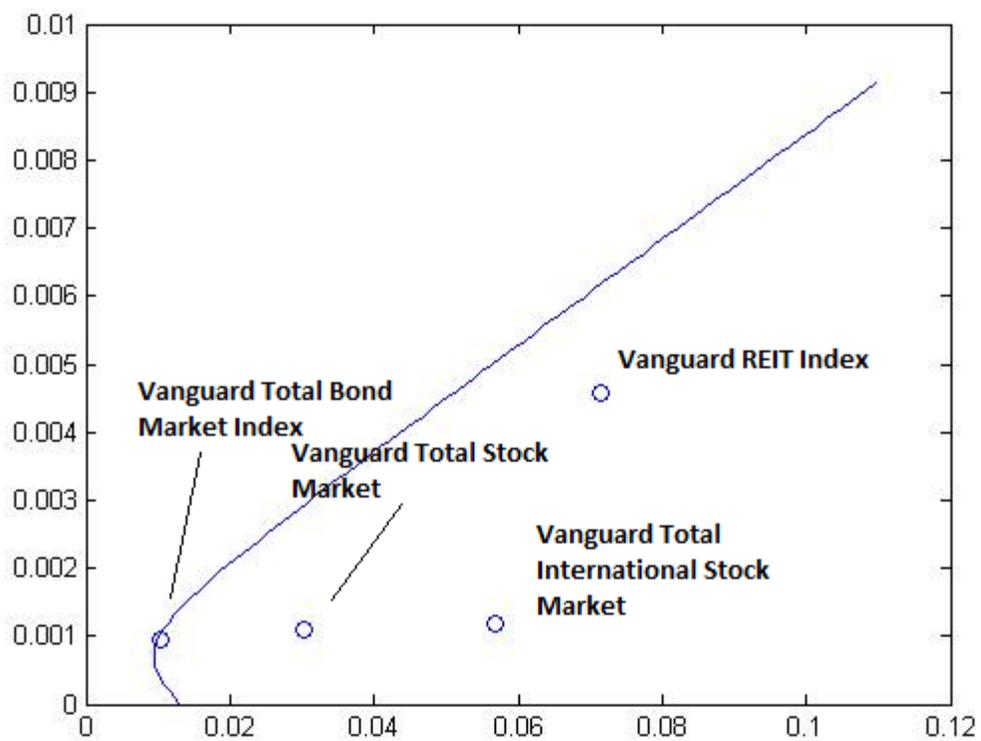## Allan Roth Efficient Frontier
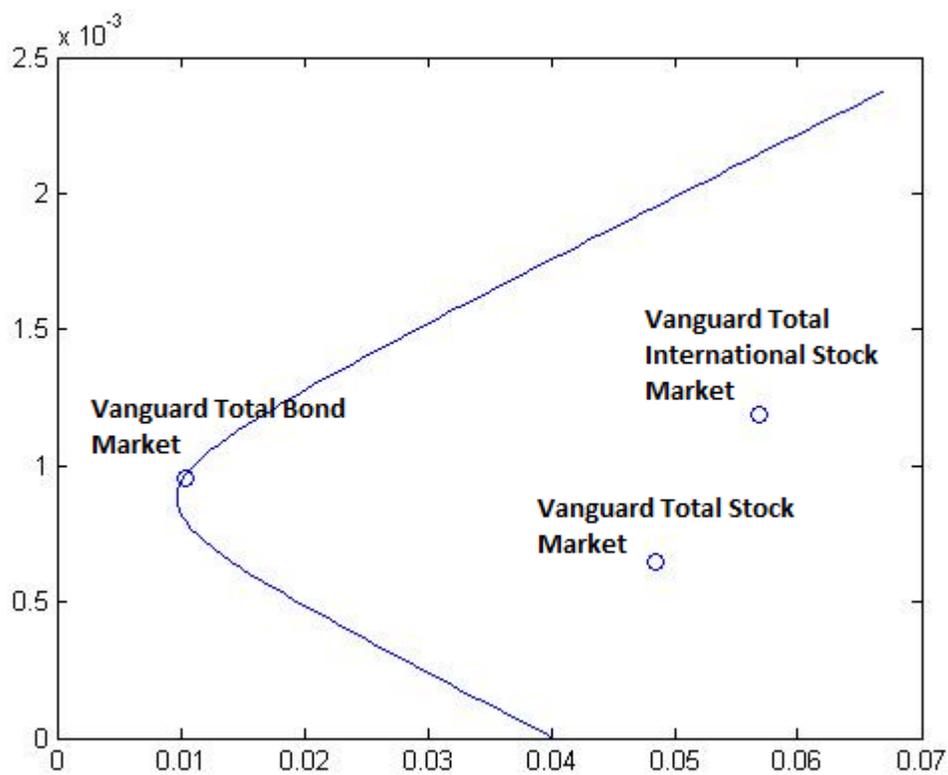
Appendix D

David Swensen Efficient Frontier
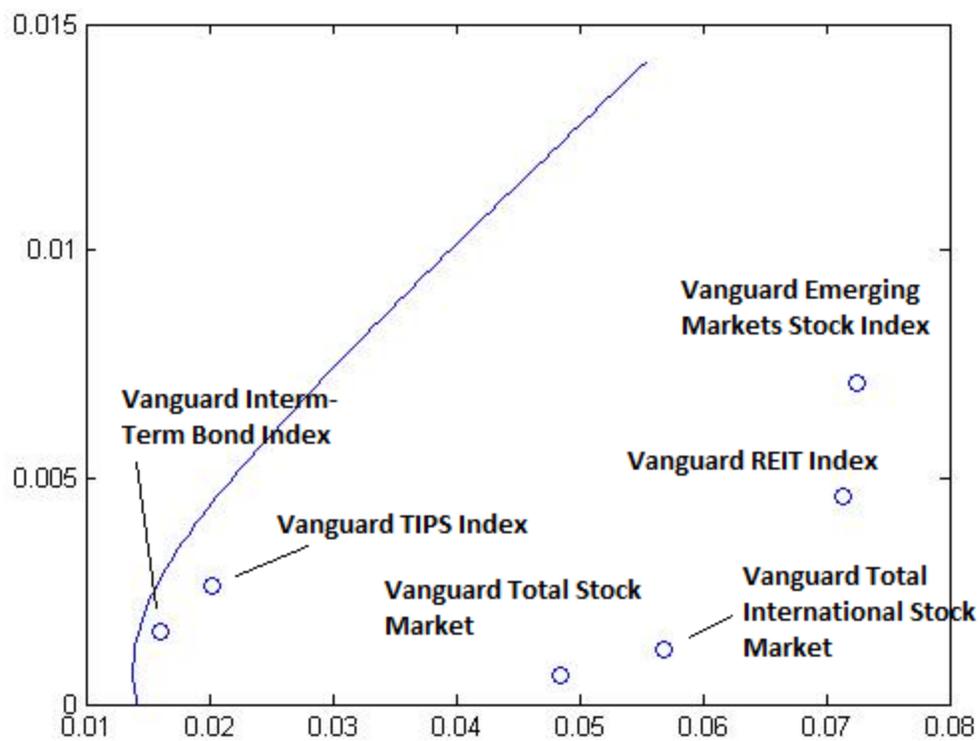
Appendix E

Rick Ferri Efficient Frontier

Appendix F

Bill Schultheis Efficient Frontier

Figure showing the Bill Schultheis Efficient Frontier with labeled points: Vanguard REIT Index, Vanguard Small Cap Value Index, Vanguard Total Bond Fund Index, Vanguard Total Stock Market, Vanguard Small Cap Index, Vanguard Value Index, Vanguard Total International Stock Index.
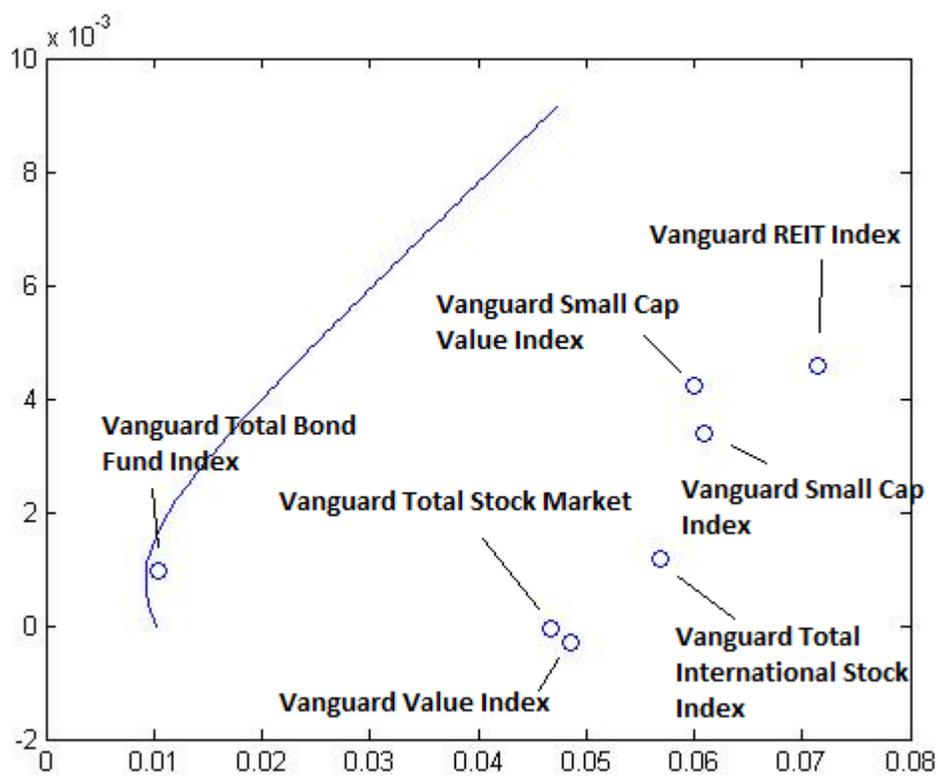
Appendix G

Harry Browne Efficient Frontier
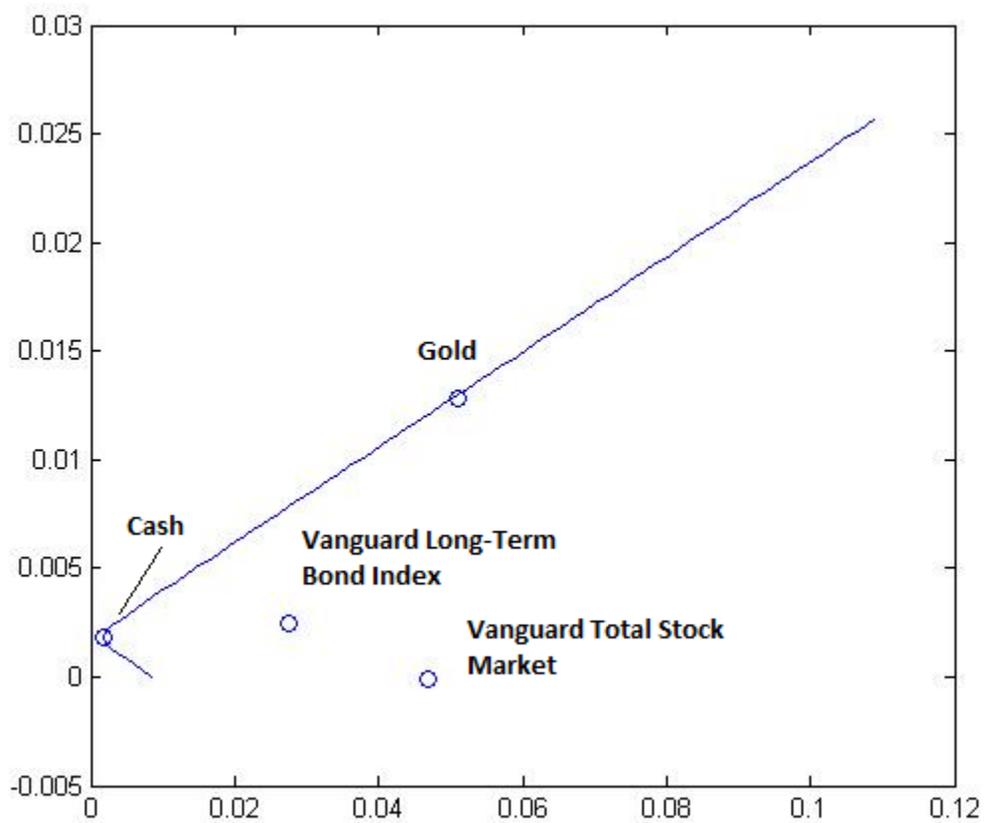
Appendix H

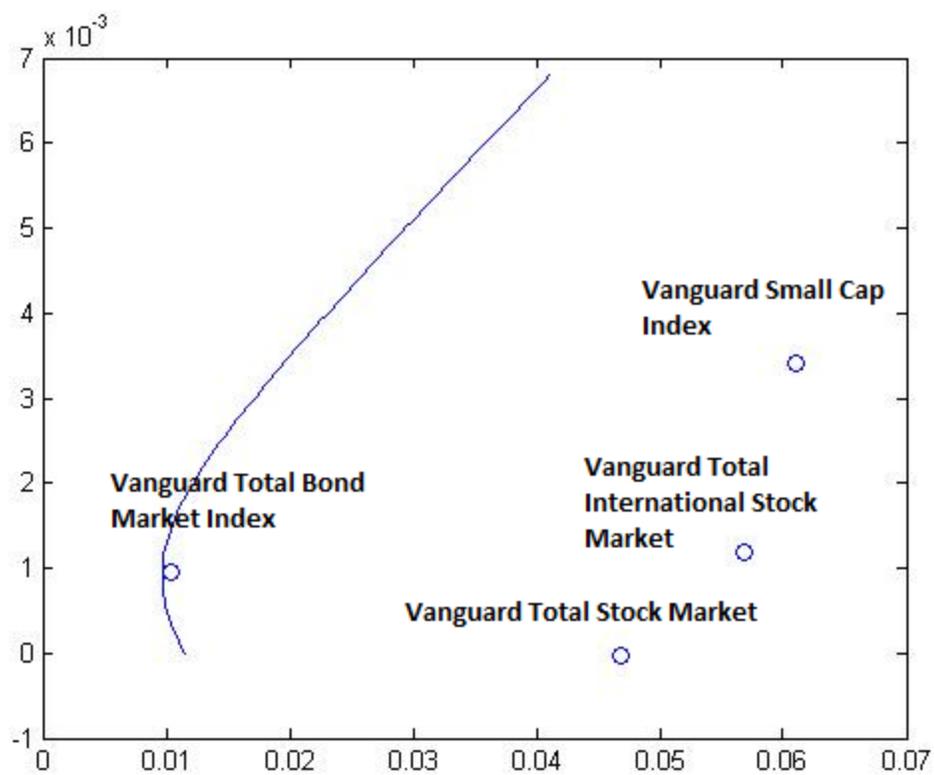## William Bernstein Efficient Frontier

Appendix J

Vanguard Index Summary	
NAESX	Vanguard Small-Cap Index
VBIIX	Vanguard Intermediate-Term Bond Index
VBLTX	Vanguard Long-Term Bond Index
VBMFX	Vanguard Total Bond Market Index
VEIEX	Vanguard Emerging Markets Stock Index
VGSIX	Vanguard REIT Index
VGTSX	Vanguard Total International Stock Index
VIPSX	Vanguard Inflation-Protected Securities Index
VISVX	Vanguard Small-Cap Value Index
VIVAX	Vanguard Value Index
VTSMX	Vanguard Total Stock Market Index

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Education

The Pennsylvania State University, *Schreyer Honors College*   *Class of 2013*
Smeal College of Business: Bachelors of Science in Finance

Related Experience

J.P. Morgan Chase & Co.   6/2012-8/2012
Investment Banking Operations Analyst Intern -- Newark, DE
- Created macro in Excel, reducing time spent on key transaction data analysis function by 80%
- Eliminated backlog of pending FX charge payments over ten weeks
- Communicated with clients involving deadlines for Turkish lira currency regulations
- Updated settlement instructions for high priority derivatives clients

Penn State Investment Association (PSIA)   8/2011-present
Analyst – University Park, PA
- Conducted equity valuations such as discounted cash flow model and comparable company analysis
- Functioned as a PSIA analyst member for the materials sector of the Nittany Lion Fund
- Acquired knowledge on a wide survey of investing and trading topics via weekly educational seminars

Work Experience

PSUKnowHow   6/2012 8/2012
Private Instructor -- University Park, PA
- Tutor students in Statistics and Economics courses
- Reaffirmed understanding of subject matter through formal tutoring sessions

Minder's Wholesale Plant Nursery   5/2007-8/2009; summers 2010-2011

General Laborer, Landisville PA

Leadership

Penn State Berks Student Government Association   2/2010-5/2011
Senior Member of the Financial Management Team --Reading, PA
- Allocated ~$100,000 to campus clubs and organizations
- Implemented quantitative budgeting tier system to ensure equitable allocation of funds
- Presented budget enhancements to over 100 members of student government
- Delegated functional tasks to new members after a formal recruitment process

Penn State Berks Student Government Association
Education Club Representative – Reading, PA   8/2009-12/2009
- Functioned as a liaison between the education club and the student government
- Communicated fundraising plans to community via weekly student government meetings
- Bloomberg, FactSet, Morningstar financial application

Honors

- Recipient of President Sparks and President's Freshman Award for academic achievement
- Member of Beta Gamma Sigma Honors Society