Funds of Funds: A Closer Look at Age-Based Investing

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INTRODUCTION

Over the next 20 years, 76 million Americans born between 1946 and 1964 will hit the half-century mark. For most, this means facing up to the hard questions of how, or even if, they will be able to afford retirement. Only 40% of Americans feel as if their retirement investment vehicles are adequately funded. A major problem with the inadequate funding of the other 60% of these individuals' portfolios is the fact that they are not capturing potential returns due to their failure to properly diversify among different asset classes. Over the last decade, mutual fund companies have recognized this significant business opportunity and have begun to tailor funds that target retirees specifically. Companies now offer products that give clients a one ticket diversification solution providing retirement income at a later date, usually indicated by the funds name; for example, *Target Retirement 2040*. These mutual funds are inherently funds of funds that pursue their investment objective by investing in other mutual funds rather than individually picking stocks and bonds. Life-cycle funds, primarily sold through 401(k)s, are designed to offer a riskier asset allocation in early years and then become more conservative as the investor's target retirement date comes closer. The retirement funds industry has been growing rapidly with assets under management increasing exponentially. This growth is partly explained by the Pension Protection Act, passed this past year, which automatically helps employers to enroll employees in retirement plans. The law also makes it easier to designate life-cycle funds as default investments in retirement plans.

RESEARCH TOPIC AND BREAKDOWN

This paper will examine the performance of different retirement mutual funds in an attempt to identify discrepancies in returns between the funds and look at differing fund characteristics to further investigate differences in performance. Philosophically speaking, a fund with the same target retirement date as another should have the same investment philosophy of providing a steady stream of income to an investor at a future date. So why is it that some of these funds are better performers than others? Every fund company and their respective portfolio managers have different techniques and strategies when it comes to managing money. This is true in reference to how many mutual funds make up their fund portfolios as well as to the way that the funds are managed. With that said, one could ask whether the portfolio with a large number of funds is more efficient than the portfolio with only a few. Is the actively managed portfolio a better performer than the portfolio made up of only index funds? My study aims to examine the performance of different target retirement mutual funds with the same investment philosophy to see if they deviate from one another.

My research will take a statistical approach as I will compare weekly raw returns of selected retirement funds. I will calculate arithmetic means, geometric means, standard deviations, t tests, as well as take a terminal wealth approach to compare what $1 invested in year ($t$-1) will amount to by year t. In addition, I will expand my investigation as I look at the composition of the funds in terms of their asset allocation, their risk, manager experience, and the number of underlying investments.

Because age-based investing is a relatively new strategy, data availability is limited in terms of the years of returns available. Because of this, it has not been the focus of much research. This is the primary reason why I chose to study this topic. My research will be a starting point for investors to consider when determining which retirement portfolios they should invest in. As stated before, only 40% of retirees feel that their retirement portfolios are adequately funded. I want to ensure that the remaining 60% of investors are aware of the best and most affordable retirement fund providers in the market. At the very least, this paper should provide insight into

which fund companies have produced the highest performing retirement funds with the least amount of risk over the selected period, whether index funds or actively managed funds performed better, and how much money investors should be paying to have their portfolios managed.

My paper is broken up into several parts. First, I will discuss the different mutual fund providers chosen for my research, along with their respective funds. Secondly, I will address the results of the funds' performance for the sample period, as well as the methodology used. Thirdly, the paper will statistically compare the weekly returns of several retirement funds from two providers to determine any deviations. Fourthly, I will address risk factors and other different fund characteristics that may affect performance. Lastly, I will discuss my findings, the implications of my results, and provide recommendations for further research.

SELECTED FUND FAMILIES

The fund families chosen for my research were picked based upon their size, reputation, and commitment to the retirement market place. The mutual fund market place is dominated by a few major players so it is not surprising that these companies were the first to recognize the need and to develop the products to facilitate age based investing. The mutual fund providers chosen for my research are: FMR Corporation, T. Rowe Price, and Vanguard.

FMR Corporation, better known as Fidelity Investments, is the largest mutual fund company in the world in terms of assets under management. Serving more than 22 million individual and institutional clients, Fidelity manages more than 300 funds and has more than $1.2 trillion of assets under management. Fidelity began offering life cycle funds in 1996 and has since continued its strong commitment to future retirees. Fidelity's Freedom Funds use a nonlinear asset allocation approach which seeks to maximize returns early on when investors have many years to go before retirement and can withstand market fluctuations. The funds are actively managed and become more conservative over time as they reach their target retirement date. At their target date, the funds adopt asset mixes that help minimize risk and provide a stream of steady income in retirement.[1]

T. Rowe Price, a smaller company, offers a variety of investment vehicles, as well as advisory services such as retirement planning for individuals. Although the provider only manages about 80 funds in all, T. Rowe has developed and managed retirement funds for a considerable time now. Like Fidelity, T. Rowe Price Retirement Funds were created to help investors meet their financial needs up to and through retirement. As the target retirement date approaches, the portfolio manager adjusts the fund's investment allocations in order to provide greater stability and reduced investment risk. A distinguishing factor in the T. Rowe Price Retirement Funds is their substantial commitment to the equity market place in the early years before retirement, to help preserve investors' purchasing power and enhance the probability of providing a comfortable retirement.

[1] Fidelity Advisor Funds, Freedom Funds INST Prospectus

Vanguard, which is similar in size to Fidelity, claims about $1 trillion in assets under management. Their fund options include more than 150 stock, bond, mixed, and international offerings. Their retirement portfolios rely on broad-based index funds such as their 500 Index Fund, which is one of the largest passively managed funds in the US. Vanguard's life cycle funds can off the advantage of low expenses due to their use of index funds as their underlying investments. All three fund families have similar objectives and investment philosophies for their target retirement funds. Below is a table depicting the objectives for each fund company:

	Fund Objectives
Fidelity's Freedom Funds	The allocation into each underlying fund differs by Freedom Fund and becomes more conservative as the target date approaches with the objective of high total return.
Vanguard's Target Retirement Funds	The funds seek to provide growth of capital and current income. The funds primarily invest in other Vanguard mutual funds according to a specific allocation with the objective of high total return
T. Rowe Price's Retirement Funds	The investment seeks the highest total return over time consistent with an emphasis on both capital growth and income. The fund invests in a set of underlying T. Rowe Price mutual funds representing various asset classes and sectors

The three of these fund companies offer a variety of Retirement Funds ranging in target retirement dates from 2005 to 2055 (see Appendix 1 for fact sheets). When selecting the mutual funds used in my research, I included only funds that had enough historical data to provide an adequate sample. I determined an adequate sample size as constituting at least 3 years of data. The introduction of target retirement funds to the market occurred about ten years ago; however, the majority of the funds' available for observation have inception dates from 2003 to 2006, with the oldest in 2002. Because of the limited data availability, it was necessary to choose funds dating back long enough to provide a significant time series. The funds selected were chosen based on their inception dates. Although T. Rowe Price's

retirement funds generally dated back earlier than Vanguard's and Fidelity's, I began calculating returns once there was commonality in the dates. The final observation consisted of three retirement funds from each fund family, with weekly returns ranging from November 2003 to March 2007 (see Appendix 2 for returns and analysis of selected funds). The sample chosen is an adequate representation of age based investing portfolios because it covers a variety of investment strategies. For instance, the funds are all comprised of differing numbers of underlying composite funds. Also, the strategies of the portfolio managers differ between companies where the funds in Fidelity's Freedom Funds are actively managed, the funds in Vanguard's Target Retirement Funds are passively managed, and the funds in T. Rowe Price's Retirement Funds use a combination of both.

John Shelon, co-manager of Fidelity's Freedom Funds, said that "It's very difficult to compare life-cycle funds because it's a little like comparing apples to oranges." Referencing other retirement fund providers, Shelon was emphasizing that you cannot compare Fidelity Advisor funds to direct no-load funds. T. Rowe Price and Vanguard offer their retirement funds directly with no load charge, meaning their funds are not bought through an adviser. Load funds charge a commission while no-load funds are commission-free. Fidelity Adviser Funds are offered to advisors who in turn sell them to investors with a commission mark up. The problem that occurs when comparing Fidelity's Freedom Funds to Vanguard's and T. Rowe Price's retirement funds is that Fidelity's returns factor in the load charge and therefore are skewed compared to Vanguard's and T. Rowe Price's no load funds. In order to ensure that I had an appropriate comparison, I quoted Fidelity's Freedom Funds using Institutional share classes (I shares). I shares waive the load charge and are used by brokers in wrap programs to offer adviser sold "loaded funds" mixed with no load funds to their clients. They make up the commission by charging their clients a set fee. Calculating the returns for Fidelity's Freedom Funds using the institutional share class provided an "apples to apples" comparison because there were not any load charges factored in. Below is a series of tables depicting snapshots of the selected Retirement Funds used in the comparison.

Fund Family (Ticker)	Fund Inception	Manager	Fund Composition
Fidelity Advisor Freedom Fund 2005 (FFTVX)	11/6/2003	Ren Chen and Jonathan Shelon (since 11/03)	Domestic Equity **40.8%** International Equity-**8.0%** Investment Grade & High Yield Bonds-**39.2%** Short-Term Funds-**12.0%**
Vanguard Target Retirement Fund 2005 (VTOVX)	10/27/2003	Duane F. Kelly (2003)	Short- term reserves **1.43%** Bonds **55.17%** Stocks- **43.4%**
T. Rowe Price Retirement 2010 (TRRFX)*	11/5/2002	Jerome Clark (9/02)	Domestic Equity-**51.3%** Domestic Bond- **31.2%** Foreign Stock- **12.1%** Foreign Bond-.**9%** Cash & Convertibles-**4.5%**

*T. Rowe Price Retirement 2010 was used because Retirement 2005 only dated back to 2004.

Fund Family (Ticker)	Fund Inception	Manager	Fund Composition
Fidelity Advisor Freedom Fund 2025 (FFTVX)	11/6/2003	Ren Chen and Jonathan Shelon (since 11/03)	Domestic Equity-**60.1%** International Equity-**13.3%** Investment Grade & High Yield Bonds-**25.6%**
Vanguard Target	10/27/2003	Duane F. Kelly (2003)	Short- term reserves **.06%** Bonds **21.13%**

Retirement Fund 2025 (VTOVX)			Stocks- **78.81%**
T. Rowe Price Retirement 2030 (TRRCX)*	7/30/2002	Jerome Clark (9/02)	Domestic Equity-**67.5%** Domestic Bond- **8.4%** Foreign Stock- **19.8%** Foreign Bond-.**2%** Cash & Convertibles- **4.1%**

* T. Rowe Price Retirement 2030 was used because Retirement 2025 only dated back to 2004.

Fund Family (Ticker)	Fund Inception	Manager	Fund Composition
Fidelity Advisor Freedom Fund 2035 (FFTVX)	11/6/2003	Ren Chen and Jonathan Shelon (since 11/03)	Domestic Equity-**67.5%** International Equity-**15.5%** Investment Grade & High Yield Bonds-**17.0%**
Vanguard Target Retirement Fund 2035 (VTOVX)	10/27/2003	Duane F. Kelly (2003)	Short- term reserves **.41%** Bonds **10.24%** Stocks- **89.35%**
T. Rowe Price Retirement 2040 (TRRDX)*	11/5/2002	Jerome Clark (9/02)	Domestic Equity-**68.7%** Domestic Bond- **7.0%** Foreign Stock- **19.9%** Foreign Bond-.**2%** Cash & Convertibles-**4.2%**

* T. Rowe Price Retirement 2040 was used because Retirement 2035 only dated back to 2004.

FUND OBSERVATION METHODOLOGY AND RESULTS

The fund observation consisted of a series of arithmetic and statistical analyses. First, I obtained the adjusted closing NAVs from November 2003 to March 2007. Using the NAVs, I calculated the weekly returns for all nine funds by taking the difference in the NAVs from week (t_{-1}) to week t and dividing the difference by the NAV from week (t_{-1}).

$$r_{t=} \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}}$$

After calculating the weekly returns for each fund, I computed the arithmetic mean, geometric mean, and standard deviation. The arithmetic mean is found by taking the aggregate return for the time series and dividing it by the number of returns in the population, ultimately producing an average return for the time period.

$$\bar{r} = \frac{\sum_{t=1}^{T} r_t}{T}$$

After calculating the arithmetic mean returns of the retirement funds, I calculated the geometric mean returns. The geometric mean is derived using the following formula:

$$\bar{r}_g = \left[(1+r_1)((1+r_2))((1+r_3))\cdots(1+r_T)\right]^{1/T} - 1$$

Calculating the standard deviations of the funds' weekly returns enabled me to measure each funds' volatility. Standard deviation measures the dispersion of a set of data from its mean. The more spread apart the data is, the higher the standard deviation and the riskier the investment. I also included a terminal wealth approach in my research to measure what $1 invested at point zero will amount to by point T in time. In doing so, I calculated the total monetary return for each mutual fund over the selected investment horizon based on a $1 investment. Below is a series of tables

depicting the statistical and arithmetic results of all the researched funds along with an analysis of each:

Freedom 2005 (FFIVX)	
Geometric Mean Return (weekly)	**0.147%**
Arithmetic Mean Return (weekly)	**0.148%**
Std Deviation	**0.733%**
Terminal Wealth	**$1.29**
Target Retirement 2005 (VTOVX)	
Geometric Mean Return (weekly)	**0.133%**
Arithmetic Mean Return (weekly)	**0.134%**
Std Deviation	**0.626%**
Terminal Wealth	**$1.26**
Retirement 2010 (TRRAX)	
Geometric Mean Return (weekly)	**0.203%**
Arithmetic Mean Return (weekly)	**0.207%**
Std Deviation	**1.009%**
Terminal Wealth	**$1.42**

Although no overwhelming discrepancies between the funds' performance emerged, there were definitely some recurring trends. The first set of funds observed were Fidelity's Freedom 2005, Vanguard's Target Retirement 2005, and T. Rowe Price's Retirement 2010. The T. Rowe Price's fund's geometric mean and arithmetic mean weekly returns were higher than those of its competitors. T. Rowe Price's fund yielded a geometric mean return of .203% and an arithmetic mean return of .207%. Fidelity yielded about ¾ as much with .147% and .148%, respectively, and Vanguard yielded the least with .133% and .134%.

Although an investor's primary objective is to seek an investment vehicle that yields the highest return, it is necessary to be aware of the level of risk one is taking on. As stated earlier, T. Rowe Price's Retirement Funds are characterized by their commitment to the equity marketplace. The returns associated with investing in equities are generally much greater than those of fixed income instruments. However, for an investor currently seeking retirement income, as in the case of those who invest in the 2005 and 2010 Retirement Funds, a heavy focus on equities may

not be appropriate. T. Rowe Price's Retirement 2010 is comprised of 51.3% equity investments, whereas Fidelity and Vanguard have 40.8% and 43.4% respectively. Although T. Rowe's fund produced higher returns for the selected time period, investors took on a considerable amount of risk. The volatility in returns is depicted in each of the funds' standard deviations. Fidelity's Freedom Fund 2005 had a standard deviation of 0.733% and Vanguard's Target Retirement 2005 had a standard deviation of 0.626%. T. Rowe Price's Retirement 2010 had a significantly higher standard deviation with 1.00%. In this case, the risk taken by an investor proved to be favorable, driven by a well performing equities market; however, it is worth noting that T. Rowe Price's Retirement 2010 is much riskier than its competitors'. This also could partially be explained by the discrepancy in the fund's target dates. While the two 2005 Retirement Funds are currently providing investment income to retirees, T. Rowe Price's Retirement 2010 has not yet hit its target retirement date and therefore can afford a slightly riskier asset allocation.

Freedom 2025 (FITWX)	
Geometric Mean Return (weekly)	**0.200%**
Arithmetic Mean Return (weekly)	**0.206%**
Std Deviation	**1.174%**
Terminal Wealth	**$1.41**
Target Retirement 2025 (VTTVX)	
Geometric Mean Return (weekly)	**0.190%**
Arithmetic Mean Return (weekly)	**0.193%**
Std Deviation	**0.989%**
Terminal Wealth	**$1.39**
Retirement 2030 (TRRCX)	
Geometric Mean Return (weekly)	**0.213%**
Arithmetic Mean Return (weekly)	**0.222%**
Std Deviation	**1.411%**
Terminal Wealth	**$1.44**

The second set of funds I observed were Fidelity's Freedom 2025, Vanguard's Target Retirement 2025 and T. Rowe Price's Retirement 2030. Again, T. Rowe Price's fund's geometric and arithmetic means were slightly higher than its competitors, yielding .213% and .222% respectively. Fidelity and Vanguard trailed closely behind with Fidelity's Freedom 2025 yielding .201% and .206% and Vanguard's Target Retirement 2025 yielding .190% and .194%. Once again, the return on T. Rowe Price's Retirement 2030 was aided by its 87% equity exposure. With a standard deviation of 1.412%, the fund maintained its position as being the most volatile of the three. Given the relatively high equity exposure, a bear market could be detrimental to T. Rowe Price's life cycle funds. Fidelity's Freedom 2025 produced a standard deviation of 1.17%.The increase in risk compared to their 2005 fund is explained by their increased exposure to high yielding equities both domestically and internationally. The concept of life cycle funds generally holds that asset allocations are more risky in the early years and become conservative as the fund reaches its target date. Vanguard's Target Retirement 2025 still managed to be the least volatile of the three with a standard deviation of .990, despite increases in its equity exposure.

Freedom 2035 (FITHX)	
Geometric Mean Return (weekly)	**0.176%**
Arithmetic Mean Return (weekly)	**0.185%**
Std Deviation	**1.429%**
Terminal Wealth	**$1.35**
Target Retirement 2035 (VTTHX)	
Geometric Mean Return (weekly)	**0.223%**
Arithmetic Mean Return (weekly)	**0.229%**
Std Deviation	**1.222%**
Terminal Wealth	**$1.47**
Retirement 2040 (TRRDX)	
Geometric Mean Return (weekly)	**0.216%**
Arithmetic Mean Return (weekly)	**0.225%**
Std Deviation	**1.412%**

Terminal Wealth	**$1.45**

The last three funds I compared were Fidelity's Freedom 2035, Vanguard's Target Retirement 2035, and T. Rowe Price's Retirement 2040. There was little discrepancy between the Vanguard and T. Rowe Price funds; however, Fidelity's fund lagged in all aspects. Vanguard's Target Retirement 2035 yielded the highest geometric mean and arithmetic mean weekly returns with .224% and .230%, respectively. Despite their superior performance, Vanguard's fund emerged as the least volatile, with a standard deviation of 1.222%. T. Rowe Price's Retirement 2040 produced a standard deviation of 1.4127% and Fidelity's Freedom 2035 fund was the most volatile with a standard deviation of 1.4291%. T. Rowe Price's and Fidelity's funds greater volatility cannot be explained by their increased equity exposure because Vanguard's 2035 fund had the largest exposure to equity securities at 89.35%. The greater risk is most likely attributable to the portfolio manager's stock choices.

PERFORMANCE COMPARISON

Given that all three of these fund families have the same investment objective of generating high total return at a projected target date, then philosophically speaking, each fund with the same target date should have similar performance. I tested this by conducting t-tests to see if the funds' mean weekly returns deviated from one another. I chose to compare Fidelity's Freedom Funds to Vanguard's Target Retirement Funds because I wanted an exact comparison. As stated earlier, T. Rowe Price's funds' target dates do not directly match up to the other two, so I omitted them. Below is a series of tables exhibiting the results from the t-tests:

t-Test: Paired Two Sample for Means
Fidelity 2005 vs. Vanguard 2005

	Variable 1	*Variable 2*
Mean	0.0013891	0.001346415
Variance	5.303E-05	3.92086E-05
Observations	173	173
Pearson Correlation	0.9248901	
Hypothesized Mean Difference	0	
Df	172	
t Statistic	0.1998593	
P(T<=t)	0.8418267	
t Critical	1.9738521	

t-Test: Paired Two Sample for Means
Fidelity 2025 vs. Vanguard 2025

	Variable 1	*Variable 2*
Mean	0.001921768	0.001939383
Variance	0.000137926	9.79341E-05
Observations	173	173
Pearson Correlation	0.960910931	
Hypothesized Mean Difference	0	
df	172	
t Statistic	-0.065529793	
P(T<=t)	0.947828288	
t Critical	1.97385213	

t-Test: Paired Two Sample for Means **Fidelity 2035 vs. Vanguard 2035**		
	Variable 1	*Variable 2*
Mean	0.002085	0.002297618
Variance	0.000172	0.000149471
Observations	173	173
Pearson Correlation	0.981683	
Hypothesized Mean Difference	0	
df	172	
t Statistic	-1.07798	
P(T<=t)	0.282551	
t Critical	1.973852	

In all three cases, the t statistics were less than the critical values, thus I could not reject the null hypotheses that the means were the same at a 5% level. Observing the t statistics, I found that the funds' mean weekly returns did not deviate from one another, supporting the investment philosophy that a target retirement fund with a certain target date should perform similarly to another target retirement fund with the same target date.

RISK ADJUSTED PERFORMANCE

My initial observation of the selected target retirement funds looked at sample data consisting of raw returns. In order to further examine the funds, I calculated the risk adjusted performance for each one. While standard deviation measures return volatility dispersed around mean, betas, Treynor measures, and Sharpe measures provide a clearer picture of an investment's risk. I calculated the betas for each fund by running a regression analysis. In order to do so, I had to calculate the S&P 500's weekly returns and run the regression comparing the S&P's weekly returns to each individual fund's returns. The tables on the following page exhibit the betas, Sharpe measures, and Treynor measures for each target retirement fund.

Freedom 2005 (FFIVX)	
Beta	**.49**
Sharpe Measure	**0.1248**
Treynor Measure	**0.0019**
Target Retirement 2005 (VTOVX)	
Beta	**.37**
Sharpe Measure	**0.1235**
Treynor Measure	**0.0021**
Retirement 2010 (TRRAX)	
Beta	**.70**
Sharpe Measure	**0.1486**
Treynor Measure	**0.0021**

Freedom 2025 (FITWX)	
Beta	**.81**
Sharpe Measure	**0.1269**
Treynor Measure	**0.0018**
Target Retirement 2025 (VTTVX)	
Beta	**.67**
Sharpe Measure	**0.1381**
Treynor Measure	**0.0020**

Retirement 2030 (TRRCX)	
Beta	**.96**
Sharpe Measure	**0.1381**
Treynor Measure	**0.0017**

Freedom 2035 (FITHX)	
Beta	**.91**
Sharpe Measure	**0.0896**
Treynor Measure	**0.0014**
Target Retirement 2035 (VTTHX)	
Beta	**.85**
Sharpe Measure	**0.1411**
Treynor Measure	**0.0017**
Retirement 2040 (TRRDX)	
Beta	**.97**
Sharpe Measure	**0.1189**
Treynor Measure	**0.0017**

In all cases, the funds' betas decreased as the target dates grew closer. This is consistent with each fund's objective of providing higher returns and taking on more risk in the early years, and then becoming more conservative and income oriented as the target date approaches. I used the betas to calculate the Treynor measures for each fund. The Treynor ratio is calculated using the following formula:

$$\text{Treynor Measure} = \frac{\bar{r} - \overline{r_{rf}}}{\beta}$$

The ratio is used to measure the returns earned in excess of that which could have been earned on a riskless investment. Fidelity's Freedom 2005, 2025, and 2035 produced weekly Treynor measures of .0019, .0018 and .0014, respectively. Vanguard's Target Retirement 2005, 2025, and 2035 produced a weekly Treynor measure of .0021, .0020, and .0020, respectively. T. Rowe Price's Retirement 2010, 2030, and 2040 produced measures of .0021, .0017, and .0017, respectively. Similarly, the Treynor ratio, the Sharpe measure uses a portfolio's excess returns to

characterize how well the return of an asset compensates the investor for the risk taken. The Sharpe measure is calculated using the following formula:

$$\text{Sharpe Measure} = \frac{\bar{r} - \bar{r}_{rf}}{\sigma}$$

Fidelity's Freedom 2005, 2025, and 2035 produced weekly Sharpe measures of .1248, .1269 and .0896, respectively. Vanguard's Target Retirement 2005, 2025, and 2035 produced weekly Sharpe measures of .1235, .1381, and .1411, respectively. T. Rowe Price's Retirement 2010, 2030, and 2040 produced measures of .1486, .1170, and .1189, respectively. As with the weekly raw returns, the risk adjusted returns exhibit few discrepancies.

FUND CHARACTERISTICS

Despite the fact that the t-tests showed that the compared funds' average weekly raw returns were not statistically different, Fidelity's Freedom Funds and Vanguard's Target Retirement Funds have several different characteristics. It is obvious that asset allocation and stock picking have a large impact on mutual fund performance; however, there are other factors to consider when determining retirement funds in which to invest. Many investors take a portfolio manager's experience into consideration when investing in a fund. Below is a table depicting the portfolio managers' experience with the life cycle funds included in the study:

Fund	Manager	Tenure with Fund
Freedom 2005 (FFTVX)	Ren Cheng & Jonathan Shelon	Since 2003
Freedom 2025 (FTTWX)	Ren Cheng & Jonathan Shelon	Since 2003
Freedom 2035 (FTTHX)	Ren Cheng & Jonathan Shelon	Since 2003
Target Retirement 2005 (VTOVX)	Duane F. Kelly	Since 2003
Target Retirement 2025 (VTTVX)	Duane F. Kelly	Since 2003
Target Retirement 2035 (VTTHX)	Duane F. Kelly	Since 2003
Retirement 2010	Jerome Clark	Since 2002
Retirement 2030	Jerome Clark	Since 2002
Retirement 2040	Jerome Clark	Since 2002

In all cases, the fund managers have been managing the funds since their inception dates. Nine-year Fidelity veteran Ren Cheng is portfolio manager of structured investments for the Structured Investment Group within Strategic Advisers, a subsidiary of Fidelity Investments. In his role, Cheng is responsible for managing over $17 billion in asset allocation portfolios as well as for new product development for defined benefit and defined contribution clients. He was named co-manager of the Fidelity Freedom Funds in 1996, and became primary fund manager in 2001. From 1985 to 1994, he was with Putnam Investments. Co-manager, Jonathan Shelon works alongside Cheng as a portfolio assistant for the Structured Investment Group within Strategic Advisers. His responsibilities include constructing and managing risk-controlled

portfolios for Fidelity's institutional clients.[2] Duane F. Kelly, Vanguard's Target Retirement Funds' manager, has only advised the funds since 2003; however, he has been in investment management since 1989. Jerome Clark, T. Rowe Price's Retirement Funds manager, joined the firm in 1991 and has been managing money for the last 9 years. All of these fund managers are experienced, making it difficult to choose between them based solely on their experience. Ren Cheng, however, is considered to be the "mastermind" behind target retirement funds. Starting the product development at Putnam Investments, he brought his idea of life-cycle funds to Fidelity and developed the Freedom Funds through the Strategic Advisers Group. Although Cheng appears to be a more seasoned manager when it comes to target retirement funds, Vanguard's and Fidelity's funds' returns did not deviate from one another.

Aside from investing in an experienced manager, a portfolio manager's investing style is equally important, if not more so. With that said, it is time to visit the question of whether or not an actively managed portfolio is a better performer than a passively managed one. The debate between active and passive management has been going on for sometime now. Active management refers to an attempt to beat the market as measured by a particular benchmark or index. Analysts and portfolio managers will look at a series of market characteristics such as: industry trends, the economy, current events, technical analysis, and company specific factors in an attempt to outperform the index for a specific fund. Passive management, more commonly referred to as indexing, is an investment management approach based on investing in the same securities, in the same proportions, as an index or sector. This management style is deemed passive because managers do not actively select which securities to buy and sell. Rather they copy an index or sector by purchasing the same securities, with the same weights. There are arguments for both sides in deciding which style produces the best performance. Investing in an actively managed retirement fund generally means that you are trusting a seasoned manager to make informed decisions based on experience, judgment, and prevailing market

[2] Fidelity Advisor Funds, Freedom Funds INST Prospectus

trends. While passive management aims to replicate the performance of a benchmark, active management attempts to beat the benchmark. Also, managers are able to make defensive plays to withstand market downturns. A disadvantage associated with actively managed retirement funds is that there is always the risk that managers may make unwise decision on behalf of their investors, and this could reduce returns. Also, actively managed funds generally have higher fees and operating expenses. Passively managed funds, on the other hand, have low operating expenses. Also, investors can be assured that index funds will perform on par with the underlying indexes or sectors. On the downside, performance is dictated and limited by the underlying index, and investors may sacrifice potential returns because they are limited to what the index can do. Passively managed funds also suffer from a lack of active control. Index fund managers are usually prohibited from taking defensive measures to withstand predicted market downturns. On the following page is a table depicting the management styles of the observed life-cycle funds:

	Active Mgt	Passive Mgt
Vanguard (2005)	0%	100%
Fidelity (2005)	100%	0%
T. Rowe Price (2010)	73.77%	26.23%
Vanguard (2025)	0%	100%
Fidelity (2025)	100%	0%
T. Rowe Price (2030)	87.25%	12.75%
Vanguard (2035)	0%	100%
Fidelity (2035)	100%	0%
T. Rowe Price (2040)	88.00%	12%

As stated earlier, the underlying funds in Fidelity's Freedom Funds are 100% actively managed. The funds do not follow a strict, linear reallocation path, nor do they abruptly change asset mixes on arbitrary dates. They truly are actively managed funds in that the fund managers monitor the portfolios daily and adjust them as needed to stay within predetermined target goals. On the contrary, the underlying funds in Vanguard's Target Retirement Funds are all 100% passively managed. Each

of their life-cycle funds relies predominantly on broad-based index funds as their underlying investments. Two of the underlying funds, Vanguard Total Stock Market Index Fund and Vanguard Total Bond Market Index Fund, seek to track the entire U.S. stock and investment-grade bond markets. For all but one of their other index funds, further diversification is achieved through international index funds such as their European Stock Index Fund. T. Rowe Price's Retirement Funds incorporate a combination of both styles. The underlying funds are predominantly actively managed, with a larger portion passively managed as the target date nears. Even though the management style used in Vanguard's Target Retirement Funds and Fidelity's Freedom Funds lie on opposite ends of the spectrum, statistical testing of their mean weekly raw returns showed that the returns did not deviate from one another. Given that these funds are already sufficiently diversified, it cannot be assumed that one management style performs better than another.

Another characteristic that differs among the observed funds is the number of underlying investments used in each. The purpose of these funds is to give clients a product that provides diversification across the market. Diversification is achieved through the different mutual funds that compose the target retirement funds. So why is it that Vanguard's Target Retirement Funds only use around 7 underlying funds, whereas Fidelity's Freedom Funds invest in as many as 15? Below is a table depicting the funds in the sample, along with the number of underlying mutual funds used in each.

Fund	# of Funds
Freedom 2005	15
Freedom 2025	13
Freedom 2035	13
Target Retirement 2005	7
Target Retirement 2025	5
Target Retirement 2035	5
Retirement 2010	13

Retirement 2030	12
Retirement 2040	12

T. Rowe Price and Fidelity Investments use similar investment approaches in terms of the number of underlying funds used in each target retirement fund. However, Vanguard takes a different approach, investing in less than half the number of underlying funds. My statistical analysis showed that there was no deviation between Fidelity's mean weekly returns and Vanguard's mean weekly returns. If Vanguard gets the same diversification effects investing in 5-7 funds compared to Fidelity's 13-15 funds, then perhaps diversification can be achieved through a smaller number of underlying investments.

Mutual fund providers charge expenses to cover compensation to the portfolio managers and other employees, record keeping and clerical fees, as well as advertising fees. These expenses are accounted for in each fund's expense ratio. Below is a table depicting the observed funds' expense ratios:

Target Retirement Fund	Expense Ratio
Freedom 2005 (FFTVX)	**0.67%**
Freedom 2025 (FTTWX)	**0.73%**
Freedom 2035 (FTTHX)	**0.77%**
Target Retirement 2005 (VTOVX)	**0.21%**
Target Retirement 2025 (VTTVX)	**0.21%**
Target Retirement 2035 (VTTHX)	**0.21%**
Retirement 2010 (TRRAX)	**0.65%**
Retirement 2030 (TRRCX)	**0.76%**
Retirement 2040 (TRRDX)	**0.76%**

Vanguard's Target Retirement Funds' expense ratios are the lowest of the other two fund families because, as stated before, Vanguard's retirement funds are passively managed. The company is able to eliminate significant costs that would be paid to an actively managing portfolio manager. Fidelity's and T. Rowe Price's active management of their funds explains their higher expense ratios. An issue that should raise concern for investors is that the expense ratios shown for Fidelity's Freedom Funds are for their institutional share class. Investors gain access to these shares by

investing in Fidelity's funds through their retirement plans. If they wanted to set up another account aside from the one their provider is offering, they would not qualify for the I shares. Investing in Fidelity's Freedom Funds by means of another share class such as the T, C, or A shares, would subject the investor to much higher expense ratios. Since the compared funds' raw returns did not deviate from one another and no clear benefit of active management could be documented, investors must be weary of the expenses they are paying for each fund.

SUMMARY AND CONCLUSION

This research aimed to examine different target retirement mutual funds to determine if the funds mean weekly raw returns deviated from one another. All of the target retirement funds had the same investment objective of providing capital appreciation and income for an investor up to and into retirement. Each funds' asset allocation begins aggressively and then become more conservative as the fund approaches the investors target retirement date. Further statistical analysis of Fidelity's Freedom Funds and Vanguard's Target Retirement Funds showed that I could not reject the hypotheses that the weekly mean returns did not in fact deviate from one another. I examined a variety of the funds' characteristics that may explain the small discrepancies between the funds' raw weekly mean returns as well as their risk adjusted returns. The funds that I observed differed in terms of their management tenure, number of underlying mutual funds, expense ratios, as well as management style. Despite these differences, there was no statistical evidence that could prove that these differences were detractors or catalysts to performance.

Investors are faced with a variety of decisions when choosing which target retirement funds to invest in. A variety of factors should be considered before making this decision. Target retirement funds differ in many aspects, including the experience of their managers, their management style, the number of underlying investments, the risk of the portfolio, as well as their expense ratios. My statistical analysis could not draw any direct correlation between these different factors and the funds' performance. This does not prove that these characteristics are not correlated with performance. It just suggests that, given the sample period studied, no correlation can be found between superior fund performance and the examined fund characteristics. This should provide significant motivation for further research. As the examined target retirement funds come closer to reaching their target dates, there may be a more significant difference in performance. If this is the case, further statistical analysis could prove that selected funds' mean returns do in fact deviate from one another. Future researchers could examine the better performing funds and

attempt to draw correlations between the characteristics that differentiate them from other target retirement funds with the same target date.

REFERENCES

Fidelity Advisor Funds, Freedom Funds INST Prospectus

Fidelity Advisor Funds, Freedom Fund INST Fund Spotlight

Fidelity Advisor Funds, Freedom 2005 Fact Sheet

Fidelity Advisor Funds, Freedom 2025 Fact Sheet

Fidelity Advisor Funds, Freedom 2035 Fact Sheet

T. Rowe Price Retirement Funds Prospectus

Vanguard Target Retirement Funds Prospects

ELECTRONIC RESOURCES

Advisor.Fidelity.com

www.Vanguard.com

www.troweprice.com

www.morningstar.com