Assessing Alternative Equal-Weight Asset Re-Balancing Rules

Albert E DePrince, Jr. and Pamela D. Morris

Abstract

This paper evaluates a hypothetical portfolio based on an equal-weight investment rule involving four asset classes: domestics, industrialized countries excluding the U.S., emerging market countries, and global bonds. Portfolio results using three alternative re-balancing rules are compared with a composite benchmark index. The simulation period runs from July 1996 through January 2010, which is dictated by the availability of data on the underlying asset classes. The equal-weight investment strategy is superior to investing the composite benchmark index in all three rules examined. The first involves no rebalancing over the simulation period. This provides the best performance versus the composite benchmark. The second rule collects and rebalances dividends according to the equal-weight investment rule. The third collects both dividends and capital gains and reallocates them among the four asset classes using the same equal-weight investment rule. Of these rules, there is a slight surrendering of return as one moves to more complex rebalancing rules. Additionally, the variability of portfolio return increases marginally as one moves from the baseline rule through the two rebalancing rules. Thus, a good case could be made to following a fixed investment rule and allowing the market to rebalance the portfolio.

I. Introduction

Specialized asset allocation mutual fund portfolios have proliferated in recent years, and these come in two general forms: (1) risk-based or strategic allocation funds and (2) life-cycle or target retirement date funds. As interest in asset allocation funds developed, their structure changed. Managers shifted from investment in a large number of domestics and foreign stocks and bonds to fund-of-funds. More and more strategic allocation funds are now taking on a fund-of-fund structure, whereas target retirement date funds are typically a fund-of-funds structure. The funds within the fund-of-funds structure are various cap-weighted indexes designed to provide a return consistent with the risk level of each life cycle fund.

At the same time, investment decisions have been complicated by the explosive growth of exchange-traded funds. Making sense of the maze of alternatives should be forefront in investment decisions. Admittedly, there is presently any number of vehicles available to investors that substitute the expertise of professional managers for the vagaries of individual choices. Target retirement year mutual funds have become a popular vehicle, along with various strategic asset allocation funds. These fund-of-fund vehicles dominate fund flows today.

Additionally, assorted weighting schemes have emerged as alternatives to broad market indexes. These include equal weight indexes and fundamental weight indexes (Arnott, Hsu, and

Albert E DePrince, Jr., Ph.D. is Professor of Economics and Finance at the Jennings A. Jones College of Business, Middle Tennessee State University, Murfreesboro, TN 37132. He can be contacted at deprince@mtsu.edu. Pamela D. Morris, Ph.D. is a Finance Professor for the Department of Finance and Economics in the School of Business and Management ,Kaplan University, Fort Lauderdale, FL 33309. She can be contacted at PMorris3@kaplan.edu.

Moore, 2005; Siegel, 2005, and Wood and Evans, 2003). Some (Hsu, 2004) even argued that traditional cap-weighted indexes were suboptimal. Of these, the equal weight index has a higher turnover rate than cap-weighted indexes (S&P, 2009), due to its quarterly rebalancing. This makes equal-weight indexes a potentially high-cost alternative to the customary cap-weighted index.

Though it has returns superior to its cap-weighted cousins, there has been only limited introduction of this asset class into either mutual fund families or exchange-traded funds (ETFs). Nonetheless, the equal-weight index is an intriguing innovation, and the equal-weight notion embedded in the index can potentially lend itself to an asset allocation model which is the subject of this paper.

This study looks to a variant of this theme in which cash flows are distributed among cap-weighted asset classes on an equal-weight basis. As such, it addresses the questions as to whether a fix-allocation rule can provide returns superior to a benchmark index or a composite benchmark index. If so, this can provide a low cost vehicle to generate either the risk-based or the life-cycle asset allocation funds. The possibility of a low-cost equal-weight rebalancing alternatives to more complex fund-of fund structure is intriguing to an industry beset by rising expense ratios in recent years.

To addresses this question, the paper first provides a background on the asset allocation funds and the alternative indexes, followed by a description of the baseline equal-investment rule and the two extensions of the rule. These extensions deal with asset rebalancing among the indexes during the simulation horizon. The data are discussed, along with the data smoothing methodology. The investment rule is simulated over a 13 ½ year period (July 1996 through January 2010) for the baseline rule and the two extensions. Implications of the findings for both individual investors and fund-of-funds managers are discussed. Shortcomings are noted, and the study ends with a look to the future, including both a sense of how fund-of-funds might expand in the future.

II. Background on Asset Allocation Funds

Investors, whether individual or institutional, must make portfolio allocation decisions. Defining the stock, bond, and cash or money market composition of a portfolio is making a strategic allocation decision (Blake, Lehmann, and Timmermann, 1999). Strategic asset allocation decisions account for 94% of the total return differential in pension funds that are institutionally managed (Bogle, 1994, p. 235). Financial analysts, researchers, and fund directors interested in enhancing portfolio returns and diversifying risk have developed and investigated various asset allocation funds (Indjic, 2002). In their development, focus is placed on the needs and characteristics of the investor in order to determine asset inclusion and weights. In order to meet investor's demand, hybrid funds have evolved into two broad investment strategies, (1) risk-based funds and (2) life-cycles funds. The risk-based funds are broadly called strategic asset allocation funds and typically carry a risk profile of conservative, moderate, or aggressive. Life-cycle funds are the target retirement date funds.

An important aspect to consider when making allocation decisions is the investor’s investment horizon, which is highly dependent on age and life expectancy of the investor

(Poterba, 2001). Rational investors are assumed to be increasingly interested in protecting against principal loss as the term of their investment horizon becomes shorter; yet many investors appear to become relatively more risky over time by failing to reduce their portfolio risk as they age (Ameriks & Zeldes, 2001). These investors' allocation strategies are not necessarily irrational but can be attributed to inertia (Rugh, 2003). Target-date funds solve this inertia problem by altering the allocations as the investor approaches retirement or the funds target date. Target-date funds meet the needs of investors, who without them are perceived as irrational due to their failure to rebalance and/or modify their portfolio allocations.

At their simplest level, risks-based asset allocation funds are balanced. More recent entrants are the asset allocation funds with gradients of risk — conservative, moderate, or aggressive. Each has a mix between stocks and bonds. All must be periodically rebalanced as market valuations of the assets fluctuate. Also, asset allocation mix of those with gradients of risk will alter the mix funds geared toward obtaining the highest returns attempting to time the market varying mix of either individual stock and bonds or the underlying funds in a fund-of-funds structure in an attempt to provide a management enhanced yield. Where funds are composed of individual stocks and bonds, asset selection is actively managed. In response to expenses as well as the evolution of the asset allocation regimes, risk-based allocation funds with gradients of risk are shifting to a fund-of-funds structure. The target-date funds are typically fund-of-funds structures.

As such, the expenses associated with these asset allocation funds are higher than those associated with index funds. As of December 31, 2009, the average net expense ratio for all asset allocation funds was 1.28 percent (Principia). This represented all share classes and a total of 1447 funds. Of these share classes, 643 were fund-of-fund structures with an average net expense ratio of 1.14 percent. This compares to a net expense ratio of 0.11 percent for the 100 least expensive index funds and 0.22 percent for the next 100 least expensive. Admittedly, the industry has developed some expense index funds. The next 718 index funds have an average net expense ratio of 1.20 percent.

III. Research Objective and Methodology

This study presents alternative fixed-rule allocation schemes that seek exposure to all segments of the U.S. equity market and a broad exposure to the international (developed and emerging market) equity market, and a global bond exposure.

The approach developed and tested in this paper uses a fund-of-funds approach. This can be used either at the asset manager level in a specialized fund-of-funds or on a “do-it-yourself” portfolio for individual investors. The advantage it has over existing strategic allocation models is the fact that all the underlying funds are index funds or ETFs, and hence have lower expense ratios than actively managed funds. Hence, it is cost-effective compared with existing products.

The study begins with the notion that a separate exposure to all segments of the global market in a systematic manner is preferred to investment in the market as a whole using a broad cap-weighted index such as the MSCI All Country World Index. A similar philosophy underscores existing strategic asset allocation models.

To that end, this study develops a fund-of-funds with a broad domestic exposure (captured by the Wilshire 5000), an exposure to industrialized countries (MSCI EAFE Index), an emerging market exposure (MSCI EM Index), and a global bond exposure (Barclays Capital Global Bond Index).

At this point, exchange traded funds (ETFs) are available for these broad asset classes, and from a cost perspective, ETFs are low cost alternatives to mutual funds. The choice of underlying funds will influence the realized return due to the underlying expense ratios. This study uses index returns and does not get into the issue of the choice of underlying funds; the choice, however, will influence the real-world realized returns of the allocation strategies discussed below.

The process begins with a fund-of-funds in which the initial mix is based on a simple equal-weight weight rule, namely, 25 percent of the months investment will be made in each of the four asset classes. A set dollar amount is added to the portfolio at the end of each quarter and is allocated in accordance to the same 25 percent per asset category rule as the initial allocation.

Three alternative asset allocation schemes are then assessed. In the baseline, the quarterly investment of contributions follows the equal-weight rule, and dividends and capital gains reinvested in the asset class that generated the dividends and capital gains. No re-allocation will be made throughout the simulation horizon. This inertia assumption allows markets to reallocate the investments on an ongoing basis.

The baseline equal-weight investment strategy assumes that an equal cash contribution is made monthly into each of the asset classes. No reallocations are made. Thus, the equal weight refers to the contribution into each of the four asset classes. At the outset of the simulation period each of the four asset classes have an equal weight. Going forward, the market will effectively reallocate between the four asset classes as the market total return varies among the classes. The value of each asset class at any point in time may be denoted by

$$wilshire_t = wilshire_{t-1} \times (1 + r_{w,t}) + div_{w,t} \times wilshire_{t-1} + 1000$$

$$EAFE_t = EAFE_{t-1} \times (1 + r_{eafe,t}) + div_{eafe,t} \times EAFE_{t-1} + 1000$$

$$EM_t = EM_{t-1} \times (1 + r_{bond,t}) + div_{bond,t} \times BOND_{t-1} + 1000$$

$$BOND_t = BOND_{t-1} \times (1 + r_{bond,t}) \times BOND_{t-1} + 1000$$

$$portfolio_t = wilshire_t + EAFE_t + EM_t + BOND_t$$

This model assumes that the periodic contribution is made at the end of each period (monthly). Additionally, the dollar value of this period's dividends is based on last period's portfolio and the dividend contribution portion of this period's total return.

The equal-weight investment rule rests on the assumption that over time, markets re-

allocate the portfolio, which may be superior to any attempt to capture rotation among asset classes. At its simplest level, this may be a test of the way most individuals make their monthly contributions into sponsored retirement plans, that is, a fixed dollar amount allocated among a preset choice of funds with little change in that investment strategy over time. Here, there is some evidence of investor inertia in terms of either the portfolio or the contributions (ICI).

The second scheme collects the capital gains at the end of each quarter and allocates them among the four asset classes on an equal weight (25 percent) basis. In this alternative, capital gains remain with the asset class that generated the capital gains. The third alternative collects the capital gains and the dividends at the end of each quarter and reallocates them based on the same equal-weight rule. This alternative may be denoted by

$$wilshire_t = wilshire_{t-1} \times (1 + r_{w,t}) + (div_{w,t} \times wilshire_{t-1} + div_{eafe,t} \times EAFE_{t-1} \\ div_{em,t} \times EM_{t-1} + div_{bond,t} \times BOND_{t-1}) / 4 + 1000$$

$$EAFE_t = EAFE_{t-1} \times (1 + r_{eafe,t}) + (div_{w,t} \times wilshire_{t-1} + div_{eafe,t} \times EAFE_{t-1} \\ div_{em,t} \times EM_{t-1} + div_{bond,t} \times BOND_{t-1}) / 4 + 1000$$

$$EM_t = EM_{t-1} \times (1 + r_{em,t}) + (div_{w,t} \times wilshire_{t-1} + div_{efea,t} \times EAFE_{t-1} \\ div_{em,t} \times EM_{t-1} + div_{bond,t} \times BOND_{t-1}) / 4 + 1000$$

$$BOND_t = BOND_{t-1} \times (1 + r_{bond,t}) + (div_{w,t} \times wilshire_{t-1} + div_{eafe,t} \times EAFE_{t-1} \\ div_{em,t} \times EM_{t-1} + div_{bond,t} \times BOND_{t-1}) / 4 + 1000$$

$$portfolio_t = wilshire_t + EAFE_t + EM_t + BOND_t$$

The third alternative collects the capital gains and the dividends at the end of each quarter and reallocates them based on the same equal-weight rule. This alternative may be denoted by

$$wilshire_t = (portfolio_{t-1} / 4) \times (1 + r_{w,t}) + (div_{w,t} \times wilshire_{t-1} + div_{eafe,t} \times EAFE_{t-1} \\ div_{em,t} \times EM_{t-1} + div_{bond,t} \times BOND_{t-1}) / 4 + 1000$$

$$EAFE_t = (portfolio_{t-1} / 4) \times (1 + r_{eafe,t}) + (div_{w,t} \times wilshire_{t-1} + div_{eafe,t} \times EAFE_{t-1} \\ div_{em,t} \times EM_{t-1} + div_{bond,t} \times BOND_{t-1}) / 4 + 1000$$

$$EM_t = (portfolio_{t-1} / 4) \times (1 + r_{em,t}) + (div_{w,t} \times wilshire_{t-1} + div_{efea,t} \times EAFE_{t-1} \\ div_{em,t} \times EM_{t-1} + div_{bond,t} \times BOND_{t-1}) / 4 + 1000$$

$$BOND_t = (portfolio/4)_{t-1} \times (1 + r_{bond,t}) + (div_{w,t} \times wilshire_{t-1} + div_{eafe,t} \times EAFE_{t-1}$$
$$div_{em,t} \times EM_{t-1} + div_{bond,t} \times BOND_{t-1}) / 4 + 1000$$

$$portfolio_t = wilshire_t + EAFE_t + EM_t + BOND_t$$

This model is an outgrowth on an earlier model developed by DePrince and Morris (2007). The present study preserves their three rebalancing rules, while dealing with three shortcomings First, it was developed before the 2007-2009 financial crises, and thus does not capture extreme market movements. Second, most of the high dividend-paying stocks in the preliminary study were financials, and dividends have either been cut or eliminated in the last two years. Third and most important, the rebalancing rules were applied to six domestic styles (large cap value, large cap growth, mid-cap value, mid-cap growth, small cap growth, and small cap value), and as such, it lacked any international or fixed-income component.

IV. Benchmark

Results need to be compared with a benchmark index. Unfortunately, there are no recognized indices that combine stocks and bonds. In such cases, a composite benchmark is used. Here, the most reasonable composite is a 75 percent weight on the MSCI All Country World Index[1] and a 25 percent weight on the Barclays Capital Global Aggregate Bond Index.[2] Against this composite benchmark, the portfolios constructed above have a higher emerging markets weighting than the composite benchmark. Using these weights, the composite benchmark return over the 13 ½ year sample period is 3.76 percent.

V. Simulation Results

The simulation period used in this study extends from July 1996 through January 2010, which represents the longest common sample period for the four asset classes used in this study. In testing the equal-weight investment model, it is assumed that a total of $4000 is invested each month over this 13 ½ year period. Of this amount, an equal amount is invested each month in each of the four asset classes. As discussed earlier, two alternative investment rules are considered. Results are compared with a composite benchmark index.

a. Equal Monthly Investments in Four Asset Classes

The first stage (Model 1 in Table I) was an equal monthly investment of $1000 into each of the four asset classes. Dividends were reinvested in the investment category that generated the dividend. This produces a compound annual return of 8.1 percent over the 13 ½ year span. This performance is dominated by the performance of the emerging market sector and the bond asset

[1] The **MSCI ACWI (All Country World Index) Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. As of June 2009 the **MSCI ACWI** consisted of 45 country indices comprising 23 developed and 22 emerging market country indices.
Seehttp://www.mscibarra.com/products/indices/international_equity_indices/definitions.html#WORLDThe total return of this index over the 13 ½ year sample period is 2.96 percent. This is based on data obtained at:
http://www.mscibarra.com/products/indices/international_equity_indices/performance.html

[2] Unfortunately, information on this benchmark does not seem to be publically available. Thus, it was decided to use the Barclays Capital (U.S.) Aggregate Bond Index in its place. For purposes of calculating the composite return, the BlackRock Bond Index Fund, an Exchange-Traded Fund that tracks the Barclays Capital Aggregate Bond Index, is used in this study. So that the total return of the ETF is comparable to the total returns of the indexes, the ETF's 24 basis point expense ratio was added back into the net return to yield a gross return.

class. Though both the domestic and the EAFE portion of the portfolio lags behind the performance of the portfolio, the performance of the equal weight portfolio surpasses the benchmark return. This likely reflects two factors. The first is the overweight of the emerging market index in the portfolio. The second may well be the equal investment rule. A similar outcome was noted in DePrince and Morris (2007).

The asset mix (Table II) underwent considerable change over the simulation period. Low performance sectors (i.e., the domestic and the EAFE asset classes) fell beneath the original 25 percent mix, notwithstanding the equal periodic investments, while the asset weight of the high performing sectors rose above the 25 percent share. This market-based re-balancing is also a contributing factor to the superior performance of the fixed (equal) investment rule. The rise in the weight of high-performing asset classes reinforced subsequent high performance on the overall portfolio, Unfortunately, this will also contribute to an underperformance of the overall portfolio should a shift in asset class performance develop.

b. Reallocation of Dividends

The second stage (Model 2 in Table I) maintained the fixed equal monthly contribution but went on to aggregate each month's dividends. The aggregated dividends were then reallocated equally among each of the four asset classes. Here, the compound annual return slipped to 7.9 percent. The loss in performance is likely attributed to the reallocation of the coupon payments in the aggregate bond index to asset classes whose performance is less than that of the sector generating the coupons (the aggregate bond class).

Asset class weights again shifted, but the fall in the shares of the lower performing asset classes was not as large. This reflects the reallocations of the dividends (and coupons) from the high performing asset classes.

c. Reallocation of Dividends and Capital Gains

The third stage took the methodology of the second stage and went on to collect the capital gains each month. The aggregate capital gains, along with the aggregated dividends, were then reallocated equally among the four asset classes. The 13 ½ years compound annual return dips to 7.8 percent, which is still over twice the return on the benchmark composite index. Here reallocation of capital gains from high capital gains to low capital gains generating asset classes probably accounts for the slight diminution in performance compared with Models 1 and 2. Here, there is no change in the asset weights over the simulation period, reflecting the complete reallocation of both dividends and capital gains according to the equal investment rule.

VI. Rebalancing Rules and Variability of Portfolio Returns

The standard deviation of one-month portfolio returns is used as the measure of portfolio variability. These are reported in Table I. As can be seen, there is a slight increase in portfolio variability as one moves from Model 1 (fixed investment of monthly cash flows with no rebalancing of dividends or capital gains) through Model 3, which preserves the original 25 percent weight in each asset class. While the increase in returns variability may seem negligible as the asset rebalancing increases in complexity, it does suggest that the gains from such a complex rebalancing may not be worth the effort, particularly when execution costs are considered.

VII. Rebalancing Rules and Estimated Expense Ratios

Up to this point, expense ratios on the underlying funds are not considered, and the choice of funds will alter the performance outcome. To address this point, expense ratio from ETFs for each of the four asset classes were collected and combined using the average weights reported in Tables II. Expense ratios are reported in Table III for the selected iShares ETFs. Readers should note that the ETFs are large and each has a sizeable daily volume; hence, they have the liquidity necessary for periodic rebalancing. In reviewing these data, readers should also note that the iShares Russell 3000 ETF was used rather than the Wilshire 5000 Total Market Index ETF in calculating the expense ratio. This is because the Wilshire ETF has only recently been introduced, and as such, it lacks the size and liquidity needed for use in a fund structure with periodic rebalancing.

Table IV reports the effects of expense ratios on total returns. As can be seen, the effective expense ratio for Models 1 and 2 are equal and have the same effect of their respective total returns. In contrast, the effective expense ratio on Model 3 is a bit smaller, due mainly to a reduced weight on the emerging market ETF. As a result, on a net basis, the difference between Model 3 and Models 1 and 2 narrows slightly from that reported in Table II.

Finally, execution costs are involved whenever reallocations are considered. If done on a small scale, execution costs would be minimal. However, if re-allocation among separate index funds within a fund-of-funds complex is done on a large-scale basis, there will likely be execution effects. These would obviously alter the outcome from that reported in Table I, and estimating such effects are beyond the scope of this paper.

VIII. Looking Ahead

Several points need to be noted at this time. First, the world economy will likely continue the fast growth in emerging economies relative to the U.S. and Europe. As a result, shares of global GDP will begin to converge among the U.S. (represented by the Wilshire 5000), other developed countries (represented by MCSI-EAFE), and emerging economies (represented by MSCI-EM). Indeed some see the field leveling within the next 50 years (Teach, 2007). In a sense, the portfolios used in this study capture this convergence with the equal weights of the three geographic-based asset classes.

As convergence occurs, fund-of-funds will need to raise the relative share of the emerging market fund within the fund-of-funds structure. The simple world of one broad-based fund of the Vanguard model will likely give way to either one global fund (US, EAFE, and EM firms) or a three-fund combination (US, EAFE, and EM funds). However, results from this study will still likely hold. Simplicity of structure will likely provide returns equal to or better than more complicated structures after fees in the long-run.

Second, in response to the growing share of GDP in the emerging markets, the equity and bond markets in those regions will also grow, and with that growth there may well be an expansion of specialized regional funds. Already, emerging markets are showing signs of parsing itself into more specialized areas. For example, as asset values in the BRIC (Brazil, Russia, India, and China) area mature, some focus is shifting to GCC (Cooperation Council of the Arab States of the Gulf, composed of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United

Arab Emirates) and its broader cousin, MENA countries. The latter is composed of Middle East and North Africa countries. While still in the infant stage of development, funds composed of MENA countries are appearing. As examples, see Atlas (no date); Stensgaard (2008); and de Sa'Pinto (2007).

IX. Epilogue

The basic purpose of this paper was accomplished. Results show superiority of the equal-weight investment strategy in a market-encompassing an array of indexes over investment in a single market-wide index, with the best results involving no rebalancing. Interestingly, this suggests that individuals who have a fixed and roughly equal investment strategy in a limited number of index funds that encompass the entire equity market in their retirement packages may have stumbled onto an optimal strategy.

It is useful to note that while regular rebalancing of both dividends and capital gains (Model 3), to preserve the original equal-weight asset mix, comes at a slight cost compared with Model 1, the performance of Model 3 is still superior to the benchmark composite. This is important, since the complete re-balancing reduces the adverse effect of any rotation of performance among asset classes noted above. Thus, the slight surrender of performance may produce a reduced portfolio variance when such performance rotations occur. Finally, comparing results of this study and the earlier DePrince and Morris (2007) study, gains from rebalancing seem related to the time frame and the asset classes. As with the current study, the 2007 fixed rebalancing rule produced returns superior to a broad index in all three regimes. However, Unlike the present study, the 2007 study produced slightly better results for full rebalancing of dividends and capital gains. In any event, differences between the three rebalancing rules were minor as with the current study.

While results may be sample-period dependent, one conclusion seems to be clear. The fixed rebalancing rules provide returns superior to a composite index, and a strong case can be made for Model 1, i.e., fixed periodic investments while allowing the market to reallocate among asset classes.

TABLE I: Total Returns for Alternative Portfolio Simulations (July 1996—January 2010)

	Benchmark Return	Domestic Return	EAFE Return	EM Return	Aggregate Bond Return	Portfolio Return	Std Dev of Mthly Returns
Model 1*	3.76	2.27	4.05	11.80	11.08	8.12	3.85
Model 2**	3.76					7.94	4.01
Model 3***	3.76					7.81	4.06

Note: *Model 1:$1000 per fund per month no reallocation,**Model 2:$1000 per fund per month reallocation of dividends, and ***Model 3: $1000 per fund per month reallocation of dividends and accretions

TABLE II: Asset Weights

	Domestic		EAFE		EM		Aggregate Bond	
	Start	**End**	**Start**	**End**	**Start**	**End**	**Start**	**End**
Model 1	25.00	16.07	25.00	18.28	25.00	33.81	25.00	31.84
Model 2	25.00	18.66	25.00	19.65	25.00	34.96	25.00	26.74
Model 3	25.00	24.84	25.00	24.59	25.00	24.30	25.00	26.27

Table III: Expense Ratios on Underlying Funds

	ETF	Ticker	Expense Ratio	Model Weights		
				Model 1	Model 2	Model 3
Broad U.S. Market	iShares Russell 3000 Index	IWV	0.21	16.07	18.66	24.84
	Wilshire 5000 Total Market Index	WFVK	0.12			
EAFE	Ishares MSCI EAFE	EFA	0.35	18.28	19.65	24.59
Emerg. Mkt Index	Ishares MSCI Emerging Market Index	EEM	0.72	33.81	34.96	24.3
Broad Bond Index	iShares Barclays Capital Aggregate Bond Index	AGG	0.24	31.84	26.74	26.27

Table IV: Expense Ratios and Performance

	Gross Return	Weighted Expense Ratio	Net Return
Model 1	8.12	0.42	7.70
Model 2	7.94	0.42	7.52
Model 3	7.81	0.37	7.44

References

Atlas Investment Group, (No Date). New Products.Retrieved September 30, 2010, from http://www.atlasinvest.net/index.php?option=com_content&task=view&id=47&Itemid=75.

Ameriks, John and Stephen P. Zeldes. 2001. How Do Household Portfolio Shares Vary with Age? *TIAACREF Institute Working Paper Series.*

Arnott, Robert D., Jason Hsu and Philip Moore. 2005. Fundamental Indexation, *Financial Analysts Journal*, 61(2). pp. 83-99.

Blake, David, Bruce N. Lehmann, and Allan Timmermann.1999. Asset Allocation Dynamics and Pension Fund Performance, *Journal of Business*, 72(4). pp. 429-461.

Bogle, John C. 1994.Bogle On Mutual Funds: New Perspectives for the Intelligent Investor, New York: Dell Publishing.

DePrince, Albert E., and Pamela D. Morris. 2007. "Testing a Hybrid Broad-Market, Equal-Weight Fund-of-Funds Portfolio." 64th Annual Meeting, International Atlantic Economic SocietySavannah, GA, September 7-10.

De Sa'Pinto, Martin. 2007. "MENA Real Estate Fund Offers High Yield." Lipper HedgeWorld News.http://www.hedgeworld.com/news/read_newsletter_aa.cgi?section=peop&story= peop3220.html. October 2.

Hsu, Jason C. 2004. Cap-Weighted Portfolios are Sub-Optimal Portfolios, *Research White Paper#WP5401*, Graduate School of management, University of California at Irvine.

Indjic, Drago. 2002. Strategic Asset Allocation with Portfolios of Hedge Funds, *AIMA Journal*, December 2002.

Poterba, James M. 2001. Demographic Structure and Asset Returns, *The Review of Economics and Statistics*, 83(4), pp. 565-584.

Rugh, Jacob S. 2003. Participant Contribution and Asset Allocations During the Bull and Bear Market: Evidence from TIAA-CREF." *Benefits Quarterly*, 4thQuarter, pp. 55-67.

Siegel, Jeremy J. 2005. The Future for Investors: Why the Tried and the True Triumph Over the Bold and the New, New York: Crown Business.

Standard and Poor's (S&P). 2009.S&P Equal Weight Index Methodology. Retrieved September 30, 2010, fromhttp://www2.standardandpoors.com/spf/pdf/index/SP_Equal_Weight_ Index_Methodology_Web.pdf.

Stensgaard, Anne-Birte .2008.Orion Capital joins the Dubai International Financial Centre, Monday, May 12 – 2008. Retrieved September 30, 2010, from http://www.ameinfo.com/156382.html.

Teach, Edward. 2007. Prognosticators of all stripes agree: economic reality will undergo a seismic shift. September 1.

Wood, Paul, and Richard Evans. 2003. Fundamental Profit Based Equity Indexation: A Better Way to Hold the Market, *Journal of Indexes*, April 2003 (2nd Quarter)