

Investing Your Own Endowment Fund like Harvard Invests

Timothy G. Peterson

Abstract

This paper describes the investment strategy pursued by Harvard in managing their endowment fund. The Harvard Endowment Fund pursues extreme diversification in the asset class mix in their investment portfolio. The endowment portfolio deemphasizes US equities and fixed income and substitutes these asset classes with investments in real estate, commodities, private equity, emerging market equities, and developed foreign equities. The returns from the Harvard Endowment Fund have exceeded benchmark indexes substantially over the last 25 years.

This paper illustrates creating your own endowment fund using exchange traded funds and index mutual funds representing various asset classes. The paper shows which funds can be used as a proxy for the underlying asset class. A simulated model portfolio invested in exchange traded funds is created and the historical returns from that portfolio are computed and compared against the returns from the Harvard Endowment Fund and the S&P 500 Index for the same period.

I. Introduction

One of the tenets of modern portfolio theory is that the portfolio return can be maximized with a fixed level of risk or the risk can be minimized with a fixed portfolio rate of return. These optimal combinations of risk and return exist on what is called the efficient frontier. The portfolio must be diversified across different asset classes but true diversification can only be achieved when the returns from the assets in the portfolio are properly correlated with each other. The optimal combinations of risk and return can only be achieved when the risky assets in the portfolio have low or negative correlations with each other. If the returns from the assets in the portfolio have correlation coefficients close to zero or negative the assets are correctly correlated to generate the optimal risk and return combinations that would be located on the efficient frontier.

In David Swensen's book [A Fundamental Approach to Personal Investment](#) he makes the case for including more diverse asset classes in the typical portfolio. Swenson also makes the case for the importance of rebalancing the portfolio regularly if stable portfolio returns are to be generated. Swensen also makes the case for not including precious metals or currencies in the portfolio. Swensen manages the Yale Endowment Fund and his philosophy and approach mirror the philosophy and approach of the Harvard Endowment Fund.

This paper attempts to construct a model portfolio that includes several diverse asset classes that have lower correlations with each other than the conventional investment portfolio. Exchange traded funds bring exposure to asset classes that in the past has been difficult to access for the typical institutional or retail investor. Many of these now accessible asset classes have correlations with equities that are lower than other asset classes. Correlations between the various exchange traded funds were considered in the construction of the simulated portfolio.

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II. Harvard Endowment Fund

The Harvard Endowment Fund has generated annual returns over the past 20-25 years that have exceeded the benchmarks in each of their invested asset classes. The endowment has exceeded the endowment performance of the smaller endowments of other colleges and universities.

Table One
Performance Data of Harvard Endowment Fund

The annual returns of the Harvard Endowment Fund are listed below for the years 1990 thru 2008. June 30 is the fiscal year end. The Endowment Fund has averaged 14.6% per year with a standard deviation of 8.9% over this time span.

Year	Return	Year	Return	Year	Return	Year	Return	Year	Return
2008	8.6	2004	21.1	2000	32.2	1996	26.0	1992	11.8
2007	23.0	2003	12.5	1999	12.2	1995	16.8	1991	1.1
2006	16.7	2002	(0.5)	1998	20.5	1994	9.8	1990	7.5
2005	19.2	2001	(2.7)	1997	25.8	1993	16.7		

There are various reasons why the Harvard Endowment Fund has generated these high market returns. First, the endowment practices extreme diversification in the portfolio composition of the various asset classes. The portfolio is composed of numerous asset classes that are either non-existent or grossly underweighted in the typical university endowment portfolio. Not only is the typical institutional portfolio underweighted in these asset classes, but so are most portfolios suggested or created for individual retail investors. Most recommended portfolios are primarily comprised of the three basic asset classes of equities, fixed income, and cash. The endowment at Harvard has expanded beyond these basic asset classes and includes alternative asset classes that are routinely invested or traded but seldom appear in the typical institutional or individual investment portfolio. The Harvard Endowment Fund is over weighted in these alternative asset classes and underweighted in the basic asset classes.

Second, the endowment has a long term investing horizon. The investing horizon may span many years. This long term holding horizon allows the endowment to invest in asset classes without regard to near term liquidity needs and invest in illiquid assets such as natural resources, more specifically timber lands. At one time Harvard had as much as 30 percent of its portfolio invested in raw timber. Most studies of any asset class show that the probability of economic loss is inversely related to the length of the investing holding period. Investing in alternative asset classes is feasible for the individual investor by using exchange traded funds (ETF) in an investment portfolio as numerous ETSs have emerged that invest in commodities, currencies, natural resources, metals, real estate, energy, and timber. There are also specialized mutual funds that have emerged that invest in these alternative classes or undertake specific non typical investing strategies.

Third, the Harvard Endowment Fund rebalances their portfolio on a consistent and regular basis. Rebalancing ensures that the target portfolio allocations are maintained during the year. Failure to maintain the target allocations would increase the probability that the actual

returns would deviate from the target portfolio returns. It is this strict discipline of rebalancing that helps the endowment to sell its winners and buy its losers, in other words sell high and buy low. Rebalancing can be replicated by individual investors.

Fourth, the endowment uses the best hedge fund managers and money managers. The endowment undertakes a rigorous and in depth analysis of money managers and subjects these money managers to a due process ensures that these endowments hire only the best and brightest. The endowment hires these money managers for their hedge fund, private equity, and absolute return components of their portfolio. Much of the success of the endowment performance is due to the ability to employ the best money managers and to nurture long term relationships with these money managers. Unfortunately hedge funds and private equity are areas that are hard to access for the individual investor.

Fifth, there is an overweighting in equity type asset classes with corresponding underweighting in fixed income asset classes. Approximately 70 per cent of the assets are invested in equity type investments: stocks, real estate, commodities, private equity. Equity type investments are used to provide the growth energy of endowment portfolio.

The endowment target asset allocations of Harvard are presented in the following table. The Harvard endowment is relatively less invested in domestic equities and bonds and more invested in real assets. The table shows the changing asset class mix over the last fifteen years.

Table Two
Asset Class Allocation of Harvard Endowment Fund
Harvard Management Company
Policy Portfolio Evolution

	<u>2010</u>	<u>2005</u>	<u>1995</u>
Domestic Equity	11%	15%	38%
Foreign Equity	11%	10%	15%
Emerging Markets	11%	5%	5%
Private Equity	13%	13%	12%
Total Equity	46%	43%	70%
Absolute Return	16%	12%	0%
Commodities	14%	13%	6%
Real Estate	9%	10%	7%
Total Real Assets	39%	35%	13%
Domestic Bonds	4%	11%	15%
Foreign Bonds	2%	5%	5%
High Yield Bonds	2%	5%	2%
Inflation-Indexed Bonds	5%	6%	0%
Total Fixed Income	13%	27%	22%
Cash	2%	(5%)	(5%)

Total 100% 100% 100%
 Source: Harvard Management Company Annual Report

Table Three
 Harvard Endowment Fund Performance by Asset Class

Annualized Ten-Year Performance by Asset Class		
	Actual	Benchmark
Total Endowment	8.9%	4.5%
Public Market Equities	4.1%	2.0%
Private Equity	15.0%	5.1%
Absolute Return	10.6%	3.8%
Real Assets	10.2%	6.0%
Fixed Income	12.2%	6.1%

Source: Harvard Management Company Annual Report 2009

The Harvard Endowment Fund is based upon adherence to modern portfolio theory and informed market judgment. Returns, standard deviations, and correlations are projected for each component of the various asset classes and then inputted into a model that maximizes the risk return tradeoff. The resulting outputs are tempered and adjusted by the subjective assessments of the endowment investment managers to arrive at the asset allocations and projected target returns of each component. With these projected returns and allocations the portfolio target return is established.

III. Risks and Rewards of Various Asset Classes

Each asset class entails certain economic characteristics that warrant its inclusion in an investment portfolio. Some of these characteristics are common to multiple asset classes and others are unique to a specific asset class. When adding assets to a portfolio the question of what incremental risk is the portfolio being exposed to needs to be addressed and what additional benefits are obtained. Including in the portfolio assets that have a low correlation with each other reduces the risk of the portfolio. Risk reduction leads to stability in portfolio returns and a closer symmetry between projected returns and actual returns.

Table Four
 List of the economic risks and desirable attributes of each asset class.

Asset Class	Desirable Attribute	Undesirable attribute - risk
Equities	Potential for superior returns relative to bonds Increased valuations due to inflation in the long term Foreign equities gain from decrease in value of US dollar	General market risk due to suboptimal economic conditions Inflation in the short term
Fixed Income	Potential for enhanced purchasing power cash flows	Inflation Higher interest rates

	during deflation and current income.	Low inflation adjusted historical returns
Real estate	Current cash flows Protection against inflation Returns are uncorrelated with stocks and bonds Potential for high returns	Returns are volatile
Natural Resources	Protection against inflation Returns are uncorrelated with stocks and bonds Potential for high returns	Returns are volatile
Private Equity	Potential for superior returns relative to bonds	Volatile returns Dependent upon competence of money manager
Absolute Return	Stable returns Low correlation to stocks and bonds Outperform in bear markets	Underperform in strong bull markets

IV .Available Exchange Traded Funds and Mutual Funds as Proxies for Various Asset Classes

The following table lists selected exchange traded funds and mutual funds that could be used to represent the asset classes represented in the Harvard Endowment Fund.

Table Five
List of Exchange Traded Funds

Asset Class	ETF	Mutual Fund
US Stocks	VTI,SPY,IVV,IWB,ISI,IYY,OEF,MDY,IWR,IWC,IWM,IJR, IWF,IWV, IJH,IJK,IWP,IWD,IVE,IWS,VIG,VTV,VUG ,VO,VB,MGC	VFINX,VLACX, VIMSX,FUSVX, FSMAX
Foreign Developed Market Equities	EPP,EZU,ILF,VPL,EFA, IOO,EFG,VEU,VEA,SCZ	VDMIX,VTWSX, VGTSX,VPACX, VEURX,FUSEX, FPBFX
Emerging Market Equities	EEM,VWO,EFV,EFG,BKF, EZU,ILF,EPP,DGS	VEIEX
US Corporate Fixed Income	BND,BIV,BLV,CSJ, CFT,LQD,HYG,AGG	VBMFX,VBIIX, VBISX,VBLTX
US Treasuries	SHY,IEI,IEF,TLH,TLT,BSV,BIV,BLV,BIL, LAG,ITE,TLO	FIBAX,FLBAX, FSBAX
US Inflation Indexed Securities	IPE,TIP	FINPX

Foreign Fixed Income	EMB,ISHG,IGOV	
Real Estate	ICF,VNQ,FTY,URE,IYR,RWX,DRW,IFNA,IFGL,WPS,FIO,RWR,XHB,ITB	
Natural Resources/Commodities	DJP,GSG,DBA,USO,GLD,DBC,IAU,IYE,WOOD,CUT,HAP	FSAGX,FSDPX,FSENX,FSNGX,RYMF
Private Equity	PSP	
Absolute Return	ALT	ALPHX,BETAX,ASFAX,PRPF,ARBFX,MERFX

Source: www.Yahoo.Finance.com and www.Fidelity.com

Exchange funds are the preferred investment vehicle for the construction of an investment portfolio primarily for their exposure to alternative asset classes. The following exchange traded funds representing various asset classes are shown in the following two correlation matrixes.

<u>ETF</u>	<u>Name</u>	<u>Asset Class</u>
CSJ	iShares Lehman 1-3 Yr Credit Bond	Fixed Income
DBA	PowerShares DB Agriculture	Commodities
DBC	PowerShares DB Commodity Index Tracking	Commodities
EFA	iShares MSCI EAFE Index	Emerging Market
GLD	SPDR Gold Trust	Precious Metals
IFGL	iShares FTSE EPRA/NARETT Global Real Estate ex-US Index	Real Estate
UHN	United States Heating Oil	Natural Resources
URE	ProShares Ultra Real Estate	Real Estate
IVV	iShares S&P 500 Index	US Equity
IWC	iShares Russell Microcap Index	US Equity
IWD	iShares Russell 1000 Value Index	US Equity
IWF	iShares Russell 1000 Growth Index	US Equity
PSP	Powershares Private Equity Portfolio	Private Equity
TIP	iShares Barclays TIPS Bond	US Fixed Income
USO	United States Oil LP	Natural Resources
VNQ	Vanguard REIT	Real Estate
VTI	Vanguard Total Stock Market	US Equity
EEM	iShares Emerging Markets Index	Emerging Market
LQD	iShares iBoxx Investment Grade	US Fixed Income

V. Correlation Matrixes of Various Exchanged Traded Funds

The following matrix shows the correlation coefficient between exchange traded funds representing the asset classes represented in the Harvard Endowment Fund.

Table Six
 Correlation Coefficients of Exchange Traded Funds Representing Major Asset Classes
 Correlation Matrix of Major Asset Class ETFs

	CS J	DB A	DB C	EF A	GL D	IFG L	UH N	UR E	IV V	IW C	IW D	IW F	PS P	TI P	US O	VN Q
CSJ	1.0 0															
DBA	.03	1.0 0														
DBC	.08	0.6 8	1.0 0													
EFA	.12	0.4 8	0.6 8	1.0 0												
GLD	.14	0.3 7	0.5 6	0.5 9	1.0 0											
IFGL	0.0 3	0.4 4	0.6 2	0.8 9	0.4 9	1.0 0										
UHN	0.0 9	0.4 3	0.6 0	0.8 6	0.4 1	0.7 9	1.0 0									
URE	.03	0.3 8	0.5 5	0.8 1	0.3 5	0.7 4	0.9 6	1.0 0								
IVV	.10	0.4 1	0.5 9	0.9 1	0.4 6	0.8 2	0.9 5	0.9 2	1.0 0							
IWC	.04	0.3 6	0.5 1	0.7 8	0.3 4	0.7 2	0.9 1	0.9 7	0.9 0	1.0 0						
IWD	0.1 1	0.4 4	0.6 2	0.9 0	0.4 5	0.8 3	0.9 5	0.9 1	0.9 9	0.8 9	1.0 0					
IWF	.08	0.3 7	0.5 5	0.9 0	0.4 5	0.8 1	0.9 4	0.9 0	0.9 8	0.8 8	0.9 4	1.0 0				
PSP	.12	0.4 5	0.5 8	0.8 2	0.3 8	0.7 5	0.8 5	0.8 1	0.8 6	0.8 1	0.8 7	0.8 3	1.0 0			
TIP	.18	0.1 0	0.1 2	0.0 2	0.1 0	0.0 1	0.0 8	0.0 4	0.0 2	0.0 5	0.0 1	0.0 5	0.0 6	1.0 0		
USO	.10	0.5 4	0.8 8	0.6 1	0.4 6	0.5 9	0.5 2	0.4 8	0.5 3	0.4 4	0.5 6	0.5 0	0.5 3	0.1 6	1.0 0	
VNQ	0.0 7	0.3 2	0.5 1	0.6 9	0.2 8	0.7 1	0.8 3	0.8 0	0.7 9	0.7 6	0.8 2	0.7 3	0.7 7	0.0 8	0.4 5	1.0 0

Correlations based upon 6 months of daily trading days ending January 20, 2010.
 Source: www.ETFScreen.com

VI. Composition of Simulated Portfolio of Exchange Traded Funds

A simulated portfolio was created composed of exchange traded funds and mutual funds. The model portfolio has asset class allocations similar to those of the Harvard Endowment Fund. Foreign and high yield bonds were omitted because of their inconsequential contribution to the

total portfolio. The exchange traded funds JNK and HYG could be invested for the asset class high yield bonds. These exchange traded funds were not included in the simulated portfolio because they have been in existence less than three years. Absolute return is represented by a mutual fund because no exchange traded fund could be found for this asset class. A REIT exchange traded fund VNQ represents the real estate asset class. Private equity is represented by the exchange traded fund PSP which has been in existence since October 2006. A constant investment in PSP was assumed prior to October 2006 for PSP. Absolute returns are represented by the mutual fund ALPHX which employs many of the strategies used by hedge funds. Domestic equity, foreign equity, and emerging market equity are represented by exchange traded funds. Commodities (natural resources) are represented by an exchange traded fund WOOD and the exchange traded fund DBC representing a commodities index. The exchange traded fund WOOD representing timber and forestry products is not a pure proxy for timber as the fund holds stocks in the timber and forestry products industries. Harvard owns significant timber land interests. These asset class target allocations are similar to those of the Harvard Endowment Fund.

Table Seven

The simulated portfolio was created using the following exchange traded funds and the portfolio target asset class allocation for each is listed below.

Asset Class	Percentage	Exchange Traded Fund
Domestic Equity	10%	VTI
Foreign Equity	10%	EFA
Emerging Markets	10%	EEM
Private Equity	15%	PSP
Absolute Return	15%	ALPHX
Commodities	15%	DBC
Real Estate	10%	VNQ
Domestic Bonds	8%	LQD
Inflation-Indexed Bonds	5%	TIP

The following matrix shows the correlation coefficients between the exchange traded funds represented in the simulated portfolio.

Table Eight
Correlation Matrix of Exchange Funds in Simulated Portfolio

	DBC	EEM	EFA	LQD	PSP	TIP	VNQ	VTI
DBC	1.00							
EEM	.61	1.00						
EFA	.61	.89	1.00					
LQD	(.05)	(.07)	(.09)	1.00				
PSP	.61	.87	.94	(.10)	1.00			
TIP	.06	0.1	(.01)	0.71	(.04)	1.00		
VNQ	.50	.64	.66	.01	.68	0.03	1.00	
VTI	.62	0.86	0.91	(.16)	0.93	(.11)	0.78	1.00

Correlations based upon 126 of daily trading days ending February 2, 2011.
 Source: www.ETFScreen.com

VII. Simulated Exchange Traded Fund Portfolio Results

The initial portfolio was created with a beginning amount of \$100,000 on July 1, 2005 with amounts allocated to various exchange traded funds and one mutual fund ALPHX. The portfolio value was determined every six months on the dates July 1 and January 1 based on the market prices of the exchange traded funds on those dates. The dollar holding period return for each six month period was calculated as the difference in market values of the fund and the total portfolio dollar holding period amount was then calculated as summed total dollar return of the various funds. The fiscal year ends June 30.

The portfolio was rebalanced every six months to bring harmony between the target asset allocations and the market asset allocations by selling and acquiring various funds to bring the asset allocations back to their target percentages.

Table Nine
 Simulated Yearly Portfolio Results

Fiscal Year 2006

<u>ETF or</u>	<u>Value</u>	<u>Holding</u>	<u>Non</u>	<u>Value</u>	<u>Holding</u>	<u>Non</u>	<u>Value</u>	<u>Percentage</u>
<u>Mutual</u>	<u>of</u>	<u>Period</u>	<u>Annualized</u>	<u>of</u>	<u>Period</u>	<u>Annualized</u>	<u>of</u>	<u>Annual</u>
<u>Fund</u>	<u>Investment</u>	<u>Gain or</u>	<u>Percentage</u>	<u>Investment</u>	<u>Loss or</u>	<u>Return</u>	<u>Investment</u>	<u>Return</u>
	<u>7/1/2005</u>	<u>Loss</u>	<u>Return</u>	<u>1/1/2006</u>	<u>Loss</u>	<u>Return</u>	<u>7/1/2006</u>	<u>Return</u>
VTI	10,000	509	5.09%	10,509	89	0.83%	10,851	5.92%
EFA	10,000	2,096	20.96%	12,096	522	4.85%	11,283	25.81%
EEM	10,000	3,354	33.54%	13,354	(499)	(4.63)%	10,263	28.90%
PSP	15,000	0	0.00%	15,000	0	0.00%	16,142	0.00%
ALPHX	15,000	786	5.24%	15,786	283	1.75%	16,425	6.99%
DBC,	15,000	0	0.00%	15,000	0	0.00%	16,142	0.00%
VNQ	10,000	896	8.96%	10,896	1,389	12.90%	12,150	21.87%
LQD	8,000	(37)	(0.46)%	7,963	207	2.41%	8,816	1.95%
TIP	5,000	(11)	(0.23)%	4,989	28	0.53%	5,409	0.30%
Cash	2,000	20	1.00%	2,020	20		2,172	1.00%
	\$100,000	\$7,614	Total	107,614	\$2,040	Total	\$109,654	9.65%

Fiscal Year 2007

<u>ETF or</u> <u>Mutual</u> <u>Fund</u>	<u>Value</u> <u>of</u> <u>Investment</u> <u>7/1/2006</u>	<u>Holding</u> <u>Period</u> <u>Gain or</u> <u>Loss</u>	<u>Non</u> <u>Annualized</u> <u>Percentage</u> <u>Return</u>	<u>Value</u> <u>of</u> <u>Investment</u> <u>1/1/2007</u>	<u>Holding</u> <u>Period</u> <u>Gain or</u> <u>Loss</u>	<u>Non</u> <u>Annualized</u> <u>Percentage</u> <u>Return</u>	<u>Value</u> <u>of</u> <u>Investment</u> <u>7/1/2007</u>	<u>Percentage</u> <u>Annual</u> <u>Return</u>
VTI	10,965	1,678	15.30%	12,643	312.19	2.60%	12,333	17.90%
EFA	10,965	1,924	17.55%	12,890	757.36	6.30%	12,778	23.85%
EEM	10,965	2,452	22.36%	13,417	1,920.54	15.98%	13,941	38.34%
PSP	16,448	0	0.00%	16,448	(1,491.80)	(8.27)%	16,539	(8.27)%
ALPHX	16,448	761	4.62%	17,209	1,435.91	7.96%	19,467	12.59%
DBC	16,448	(400)	(2.43)%	16,048	1,650.56	9.15%	19,682	6.72%
VNQ	10,965	3,173	28.94%	14,138	(2,281.18)	(18.98)%	9,739	9.96%
LQD	8,772	739	8.42%	9,511	179.37	1.87%	9,796	10.28%
TIP	5,483	205	3.73%	5,687	326.11	5.43%	6,336	9.16%
Cash	2,193	22		2,215	22		2,426	1.0%
	\$109,654	\$10,553	Total	\$120,206	\$2,831	Total	\$123,038	12.21%

Fiscal Year 2008

<u>ETF or</u> <u>Mutual</u> <u>Fund</u>	<u>Value</u> <u>of</u> <u>Investment</u> <u>7/1/2007</u>	<u>Holding</u> <u>Period</u> <u>Gain or</u> <u>Loss</u>	<u>Non</u> <u>Annualized</u> <u>Percentage</u> <u>Return</u>	<u>Value</u> <u>Of</u> <u>Investment</u> <u>1/1/2008</u>	<u>Holding</u> <u>Period</u> <u>Gain or</u> <u>Loss</u>	<u>Non</u> <u>Annualized</u> <u>Percentage</u> <u>Return</u>	<u>Value</u> <u>of</u> <u>Investment</u> <u>7/1/2008</u>	<u>Percentage</u> <u>Annual</u> <u>Return</u>
VTI	12,304	(437)	(3.55)%	11,867	(600.93)	(4.64)%	12,354	(8.19)%
EFA	12,304	(404)	(3.28)%	11,900	(1,065.40)	(8.22)%	11,890	(11.51)%
EEM	12,304	753	6.12%	13,056	(816.63)	(6.30)%	12,138	(0.19)%
PSP	18,456	(1,160)	(6.29)%	17,295	(2,764.50)	(14.23)%	16,668	(20.51)%
ALPHX	18,456	476	2.58%	18,932	(331.05)	(1.70)%	19,101	0.88%
DBC	18,456	5,560	30.13%	24,016	4,733.53	24.36%	24,166	54.49%
VNQ	12,304	(88)	(0.71)%	12,216	417.47	3.22%	13,372	2.51%
LQD	9,843	950	9.65%	10,793	(460.63)	(4.44)%	9,903	5.20%
TIP	6,152	837	13.60%	6,989	122.11	1.89%	6,600	15.49%
Cash	2,461	25		2,485	25		2,510	1.00%
	\$123,038	\$6,512	Total	\$129,549	(\$741)	Total	128,702	4.60%

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Fiscal Year 2009

<u>ETF or</u>	<u>Value</u>	<u>Holding</u>	<u>Non</u>	<u>Value</u>	<u>Holding</u>	<u>Non</u>	<u>Value</u>	
<u>Mutual</u>	<u>of</u>	<u>Period</u>	<u>Annualized</u>	<u>of</u>	<u>Period</u>	<u>Annualized</u>	<u>of</u>	<u>Percentage</u>
<u>Fund</u>	<u>Investment</u>	<u>Gain or</u>	<u>Percentage</u>	<u>Investment</u>	<u>Gain or</u>	<u>Percentage</u>	<u>Investment</u>	<u>Annual</u>
	<u>7/1/2008</u>	<u>Loss</u>	<u>Return</u>	<u>1/1/2009</u>	<u>Loss</u>	<u>Return</u>	<u>7/1/2009</u>	<u>Return</u>
VTI	12,870	(4,320)	(33.57)%	8,550	1,855	22.71%	10,025	(10.86)%
EFA	12,870	(5,163)	(40.12)%	7,707	2,906	35.57%	11,075	(4.55)%
EEM	12,870	(5,850)	(45.45)%	7,020	4,931	60.35%	13,100	14.90%
PSP	19,305	(11,793)	(61.09)%	7,512	4,388	35.81%	16,643	(25.27)%
ALPHX	19,305	(4,992)	25.86%	14,313	1,399	11.41%	13,653	(14.44)%
DBC	19,305	(9,310)	48.23%	9,995	1,688	13.78%	13,943	(34.45)%
VNQ	12,870	(5,791)	45.00%	7,079	1,485	18.17%	9,654	(26.82)%
LQD	10,296	370	3.59%	10,666	712	10.89%	7,248	14.49%
TIP	6,435	(183)	(2.84)%	6,252	244	5.97%	4,329	3.13%
Cash	2,574	26		2,600	26		2,626	1.00%
	\$128,702	(47,007)	Total	81,695	19,634	Total	102,295	(20.52)%

Data Source: www.Yahoo.Finance.com

Table Ten
Summarized Simulated Portfolio Performance Results

	Simulated	Portfolio		
Fiscal Year	Dollar	Annualized	Harvard Endowment	S&P 500 Index
	Return	Percentage Return	Fund	
2006	9,654	9.65 %	16.7%	7.19%
2007	13,384	12.21%	23.0%	19.1%
2008	5,565	4.60%	8.6%	(15.79)%
2009	(26,407)	(20.52)%	(27.3)%	(28.19)%
Average	\$549	1.48%	5.25%	(4.42)%

VIII. Conclusion

The simulated portfolio results were substantially less than the Harvard Endowment Fund results but better than the performance of the S&P 500 Index over the four year time span from July 1, 2005 thru July 1, 2009. The simulated portfolio had an absolute positive return in three of the four years but a significant drawdown in the fourth year resulted in a meager return over the four year time span. The introduction of stop losses or the use of put options could have prevented some of the devastating drawdown in the fourth year.

The main purpose of this study was to show the relevance and desirability of introducing

various asset classes into the portfolio to provide for more diversification than the typical portfolio comprised primarily of equities and fixed income affords. The simulated portfolio represented here is easily constructed for the typical retail investor in a tax deferred retirement account using exchange traded funds. The Harvard Endowment Fund is an innovative approach that adheres to modern portfolio theory more than the typical investment portfolio because it includes more asset classes that show little or no correlation between other asset classes. This paper shows that it can be done using exchange traded funds as the investment vehicle representing different asset classes.

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