



SWAN GLOBAL
INVESTMENTS

OPTIMIZING ASSET ALLOCATION

Seeking Portfolio Optimization
with Hedged Equity

by

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CAIA®, AAMS®, AWMA®

INTRODUCTION

Swan's Defined Risk Strategy (DRS) was specifically built to compensate for some of the inherent weaknesses in stock selection, market timing, and asset allocation (including buy-and-hold investing). Swan's investment philosophy is based on the belief that stock selection or market timing is difficult if not impossible and that asset allocation is not sufficient by itself to protect against market risk. Swan also believes that diversification across asset classes has limitations in growing and protecting investor's wealth and that wealth is best created and preserved by mitigating systematic risk (market risk) within a portfolio.

Based on this belief, Swan holds that market risk (as occurred in 2000-2002 and 2008-2009) cannot be addressed by Modern Portfolio Theory or diversification alone. Market risk can only be truly solved by exiting the market or by hedging. Since Swan strongly believes that no one can accurately predict or time the market in the long run, this removes or severely diminishes exiting the market as an option. This leaves hedging as the only viable solution to managing market risk. The DRS accomplishes this by using options to hedge an underlying position and by using shorter-term market-neutral option strategies to seek to generate income to help pay for the cost of hedging.

The goal of this study is to show how hedged equity, through an investment vehicle such as the DRS, can be superior to traditional asset allocation or help enhance it. In Summary:

- The DRS was created to achieve the same goals of increased returns and reduced risks sought by a diversified MPT portfolio. However, Swan DRS seeks to achieve these goals in a much simpler manner; one with more quantifiable risks and with less moving parts.
- The DRS seeks to directly and explicitly manage market risk. Traditional asset allocation takes an indirect and not-always effective approach in attempting to mitigate risk.
- The DRS seeks to provide favorable absolute and risk adjusted returns compared to almost any asset class or diversified portfolio over an entire investment cycle.
- Portfolio allocations to the Swan DRS may be beneficial to investors and advisors in a diversified portfolio over an entire investment cycle.

This does not mean, however, that there are not noticeable benefits to buy-and-hold investing and asset allocation. Asset allocation provides diversification of specific risk (unsystematic risk), reduction in volatility, and at times increased return through non-correlated assets. Furthermore, diversification can have some additional benefit by providing a simple roadmap to investors that can help to minimize emotions impacting investment decisions.

Because of some of these benefits, many investors today have portfolios built around asset allocation strategies. Many notable investment managers and scholars have published their "ideal" asset allocation strategies, and in many cases, investors have sought to follow these models in pursuit of higher returns and lower risk.

This document seeks to highlight 13 popular, well-known asset allocation strategies and illustrate how an allocation to the DRS could offer favorable absolute and risk adjusted returns.



MODERN PORTFOLIO THEORY

Building Block of Asset Allocation Portfolios

Modern portfolio theory (MPT) can be defined as a theory of finance that attempts to maximize portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets (Source: Wikipedia).

This chart visualizes the concept of MPT and asset allocation, showing how an asset allocation portfolio (the light gray-colored cells labeled “AA”) smoothed out returns over this sixteen-year time period. Notice how the AA approach is never in the top two or bottom two performing assets. In its simplest form, an investor implementing an asset allocation approach is willing to forego gains in order to mitigate losses. This is mostly because many will readily admit that it is impossible (or at least very difficult) to predict which will be the best (or worst) performing asset classes in advance. Thus, asset allocation seeks to diversify and eliminate the necessity of picking the best performers.

Asset Class Returns

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
EM 56.3%	REIT 31.6%	EM 34.5%	REIT 35.1%	EM 39.8%	HG Bnd 5.2%	EM 79.0%	REIT 28.0%	REIT 8.3%	REIT 19.7%	Sm Cap 38.8%	REIT 28.0%	REIT 2.8%	Sm Cap 21.3%	EM 37.8%	Cash 1.86%	Lg Cap 31.5%
Sm Cap 47.3%	EM 26.0%	Int'l Stk 14.0%	EM 32.6%	Int'l Stk 11.6%	Cash 1.4%	HY Bnd 57.5%	Sm Cap 26.9%	HG Bnd 7.8%	EM 18.6%	Lg Cap 32.4%	Lg Cap 13.7%	Lg Cap 1.4%	HY Bnd 17.5%	Int'l Stk 25.6%	HG Bnd 0.01%	REIT 28.7%
Int'l Stk 38.2%	Int'l Stk 20.7%	REIT 12.2%	Int'l Stk 26.9%	AA 7.6%	AA -22.4%	Int'l Stk 32.5%	EM 19.2%	HY Bnd 4.4%	Int'l Stk 23.3%	Int'l Stk 23.3%	AA 6.9%	HG Bnd 0.6%	Lg Cap 12.0%	Lg Cap 21.8%	HY Bnd -2.08%	Sm Cap 25.5%
REIT 37.1%	Sm Cap 18.3%	AA 8.9%	Sm Cap 18.4%	HG Bnd 7.0%	HY Bnd -26.4%	REIT 28.0%	HY Bnd 15.2%	Lg Cap 2.1%	Sm Cap 16.4%	AA 11.5%	HG Bnd 6.0%	Cash 0.1%	EM 11.6%	Sm Cap 14.7%	Lg Cap -4.38%	Int'l Stk 22.7%
Lg Cap 28.7%	AA 14.1%	Lg Cap 4.9%	AA 16.7%	Lg Cap 5.5%	Sm Cap -33.8%	Sm Cap 27.2%	Lg Cap 15.1%	AA 0.3%	Lg Cap 16.0%	HY Bnd 7.4%	Sm Cap 4.9%	Int'l Stk -0.4%	REIT 8.6%	AA 14.6%	REIT -4.39%	AA 18.9%
HY Bnd 28.2%	Lg Cap 10.9%	Sm Cap 4.6%	Lg Cap 15.8%	Cash 4.4%	Lg Cap -37.0%	Lg Cap 26.5%	AA 13.5%	Cash 0.1%	HY Bnd 15.6%	REIT 2.9%	HY Bnd 2.5%	AA -1.3%	AA 7.2%	REIT 8.7%	AA -5.68%	EM 18.9%
AA 25.9%	HY Bnd 10.9%	Cash 3.2%	HY Bnd 11.8%	HY Bnd 2.2%	REIT -37.7%	AA 24.6%	Int'l Stk 8.2%	Sm Cap -4.2%	AA 12.2%	Cash 0.1%	Cash 0.0%	Sm Cap -4.4%	HG Bnd 2.7%	HY Bnd 7.5%	Sm Cap -11.01%	HY Bnd 14.4%
HG Bnd 4.1%	HG Bnd 4.3%	HY Bnd 2.7%	Cash 4.7%	Sm Cap -1.6%	Int'l Stk -43.1%	HG Bnd 5.9%	HG Bnd 6.5%	Int'l Stk -11.7%	HG Bnd 4.2%	HG Bnd -2.0%	EM -1.8%	HY Bnd -4.6%	Int'l Stk 1.5%	HG Bnd 3.5%	Int'l Stk -13.36%	HG Bnd 8.7%
Cash 1.0%	Cash 1.4%	HG Bnd 2.4%	HG Bnd 4.3%	REIT -15.7%	EM -53.2%	Cash 0.2%	Cash 0.2%	EM -18.2%	Cash 0.1%	EM -2.3%	Int'l Stk -4.5%	EM -14.6%	Cash 0.3%	Cash 1.0%	EM -14.25%	Cash 2.1

Abbr.	Asset Class - Index	Annual	Best	Worst
Lg Cap	Large Caps Stocks - S&P 500 Index	9.00%	32.4%	-37.0%
Sm Cap	Small Cap Stocks - Russell 2000 Index	7.92%	38.8%	-33.8%
Int'l Stk	International Developed Stocks - MSCI EAFE Index	5.33%	32.5%	-43.1%
EM	Emerging Market Stocks - MSCI Emerging Markets Index	7.85%	79.0%	-53.2%
REIT	REITs - FTSE NAREIT All Equity Index	8.35%	35.1%	-37.7%
HG Bnd	High Grade Bonds - Barclay's U.S. Aggregate Bond Index	4.15%	7.84%	-2.0%
HY Bnd	High Yield Bonds - BofAML US High Yield Master II Index	7.11%	57.5%	-26.4%
Cash	Cash - 3 Month Treasury Bill Rate	1.30%	4.7%	0.0%

Exhibit 1: Source: Novelinvestor.com

Past performance does not guarantee future returns. The historical performance shows changes in market trends across several asset classes over the past fifteen years. Returns represent total annual returns (reinvestment of all distributions) and does not include fees and expenses. The investments you choose should reflect your financial goals and risk tolerance. For assistance, talk to a financial professional. All data are as of 12/31/19.

*Asset Allocation Portfolio is made up of 15% large cap stocks, 15% International stocks, 10% small cap stocks, 10% emerging market stocks, 10% REITs, 40% high-grade bonds, and annual rebalancing.



It is important to note, however, the two main shortcomings of MPT:

1. Current and future allocations are driven by historical or assumed relationships as communicated through the oft-repeated disclaimer for the investment community, “Past performance is no guarantee of future results.” This was most readily apparent in the last few major market corrections as correlation and historical relationship can change greatly during times of market crisis.
2. Lack of true protection from market risk. As highlighted in the last few major market corrections, asset allocation does not diversify away systematic market risk. Although an asset allocation portfolio can minimize volatility, most still have large allocations to assets that have seen multiple drawdowns greater than 50% (Source: Credit Suisse, Global Returns Yearbook, 2011).

Randy Swan, founder and CEO of Swan Global Investments, explained these shortcomings well in 1997:

“The great claim of asset allocation is that risk can be reduced by diversifying over several broad asset classes (i.e., stocks, bonds, cash and real estate) without a similar reduction in return. This risk reduction is, however, strictly theoretical (typically based upon relationships that existed over a particular period). There is no guarantee that these same relationships will continue in the future. This is the crux of where asset allocation or modern portfolio theory breaks down. Risk is not defined; instead it is merely expressed in historical standards.”¹

COMMONLY USED ASSET ALLOCATION STRATEGIES

For those wanting to implement buy-and-hold asset allocation strategies, there are numerous well-known and widely publicized model portfolios available. Many advisors have built their investment models around some of these strategies and some of the more popular “robo-advisors” have built their investment platforms around these or very similar strategies. For example, two of the largest robo-advisor platforms are based on MPT asset allocation (Source: <http://investorjunkie.com/36355/betterment-wealthfront-compare/>, October, 2014).

The following 13 asset allocation portfolios cover a wide variety of MPT followers and range from simplistic to complex. All were constructed using widely publicized information and each portfolio was rebalanced at the beginning of each year. Composition of each portfolio is as follows:

Traditional 60/40	60/20/20 (Alts)	Permanent Portfolio
60% = US Stocks (Russell 3k)	60% = US Stocks (Russell 3k)	25% = Gold (GLD)
15% = US 10+Yr Govt Bonds	20% = US 7-10 Yr Govt Bonds	25% = US 7-10 Yr Govt Bonds
15% = US 7-10 Yr Govt Bonds	20% = HFRI Fund Weighted Index	25% = Cash
10% = Citigroup Corporate Bond		25% = US Equities (Russell 3k)



Ivy Portfolio	Risk Parity	David Swensen
20% = US Stocks (Russell 3k)	7.5% = US Stocks (Russell 3k)	10% = Energy (DowAmericasOil&GasAllCapandVDE)
20%=ForeignDeveloped(MSCIEAFE)	7.5%=ForeignDeveloped(MSCIEAFE)	10% = Real Estate (MSCI US REIT)
20% = US 7-10 Yr Govt Bonds	35% = US 7-10 Yr Govt Bonds	15% = US 7-10 Yr Govt Bonds
20% = Commodities (S&P GSCI)	35%=USCorp.GradelInvestmentBonds	15% = US TIPS
20%=RealEstate(DJUSREITIndex)	5% = Commodities (S&P GSCI)	30% = US Stocks (Russell 3k)
	5% = Gold London PM Fixing	20%=ForeignDeveloped(MSCIEAFE)
	5% = Real Estate (DJ US REIT)	

Mohammad El-Erian	Rob Arnott	Scott Burns/Andrew Tobias
21% = US Stocks (Russell 3k)	10% = US Stocks (Russell 3k)	33.34% = US Stocks (Vanguard Total Stock Market Index)
15%=ForeignDeveloped(MSCIEAFE)	10% = Foreign (MSCI EAFE)	33.33% = US TIPS
12% = Emerging Stocks (MSCI EM)	20%=BOFAUSDEmergingMarkets Sovereign Debt Plus	33.33% = Foreign (VanguardTotalIntlStockMarketIndex)
7%=PrivateEquity(ProsharesGlobal ListedPrivateEquityandCarlyleGroup)	10% = US Corporate High Yield	
5% = US 7-10 Yr Govt Bonds	10% = US 7-10 Yr Govt Bonds	
9% = International Bonds (BOFA Fixed Income)	10% = Barclay's US Corporate Inv Grade Bonds	
3% = Real Estate (DJ US REIT)	10% = Commodities (S&P GSCI)	
7% = Commodities (S&P GSCI)	10% = Real Estate (DJ US REIT)	
8%=Infrastructure(MSGlobalInfrastruc- ture and MSCI World Infrastructure)	10% = US TIPS	
8% = Special Situations (HFN)		



William Bernstein ("Smart Money")	Rick Ferri/Core Four	Frank Armstrong's Ideal Index
40% = Short Term Investment Grade Bonds (VFSTX)	25% = Vanguard Total Bond Market	7% = Vanguard 500 Index Inv
15% = Total Stock Market (VFTSX)	25% = Vanguard Total Stock Market	7% = Vanguard Value Index Inv
12% = Emerging Stocks (MSCI EM)	25% = Vanguard Total Stock Index	9% = US Small Growth (S&P Small Cap 600 Growth Index and Vanguard Small Cap Growth Index Inv)
10% = Small Cap Value (VISVX)	25% = Vanguard REIT Index	9% = US Small Value (S&P Small Cap 600 Value Index and Vanguard Small Cap Value Index Inv)
10% = Vanguard Value Index (VIVAX)		30% = Vanguard Total International Stock Index Inv
5% = Emerging (VEU)		8% = Vanguard REIT Index Inv
5% = European Equities (VEURX)		30% = Vanguard Short-Term Bond Index Inv
5% = Pacific Equities (VPACX)		7% = Vanguard Value Index Inv
5% = REIT's (VGSIX)		
5% = S&P Small Cap 600		
All Seasons (Ray Dalio)	60/20/20 w Swan DRS	Swan DRS
7% = Commodities (S&P GSCI)	60% = US Stocks (Russell 3k)	100% = Swan Defined Risk Strategy Select Composite, Net of Fees
8% = Gold London PM Fixing	20% = US 7-10 Yr Govt Bonds	
21% = US Stocks (Russell 3k)	20% = Swan Defined Risk Strategy Select Composite, Net of Fees	
9% = Foreign Developed (MSCI EAFE)		
40% = US Long-Term Bonds		
15% = US 7-10 Yr Govt Bonds		



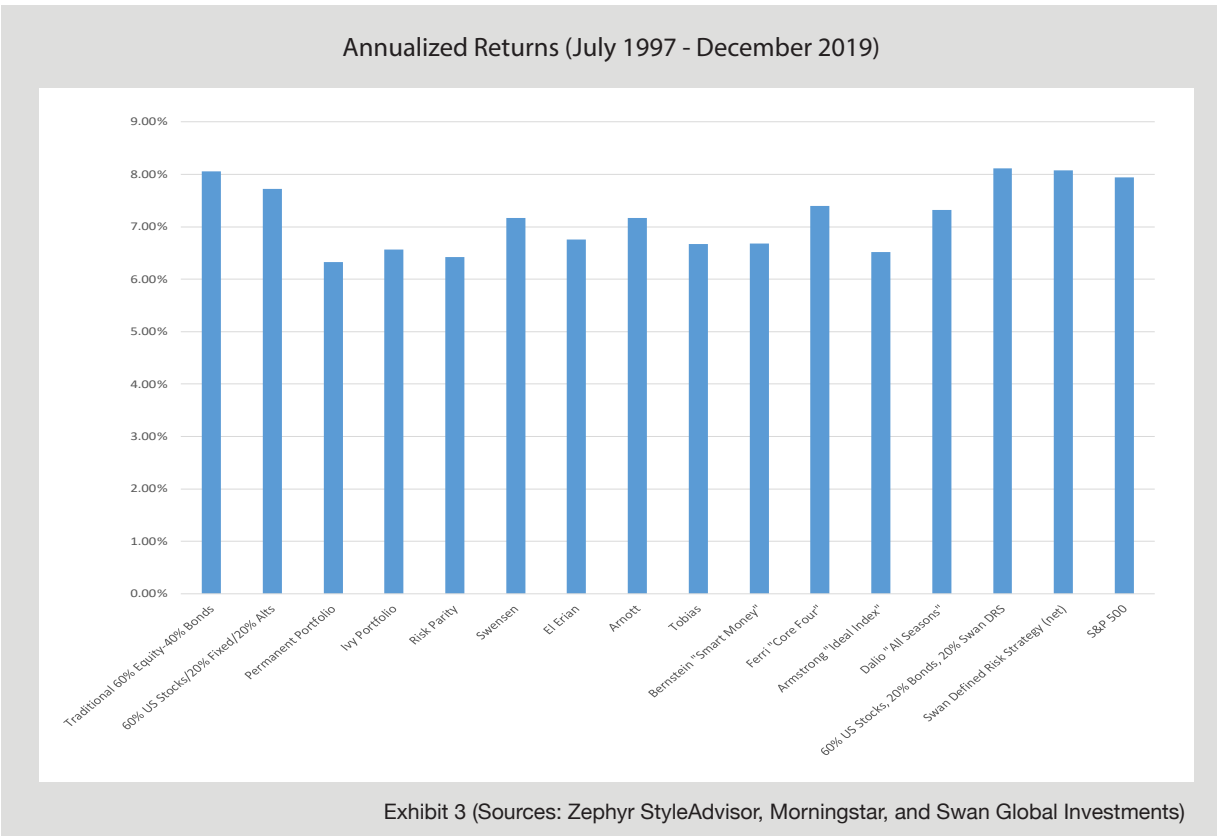
Below in Exhibit 2 are the returns and portfolio statistics for the above asset allocation strategies since July of 1997 (the DRS's inception date), as well as the S&P 500. Wherever possible, the most widely available or readily accepted indexes, mutual funds, or ETFs were used to calculate performance. No management fees, taxes, or trading expenses were included in the results (except for the Swan DRS, which is net of fees and trading expenses). Thus, actual returns for the asset allocation models would have been lower.

Portfolio Statistics: July 1, 1997 through December 31, 2019	Annualized Returns	Cumulative Return	Population Standard Deviation	Sharpe Ratio	Worst Period Return	Maximum Drawdown	Alpha vs. Market	Beta vs. Market
S&P 500 Total Return	7.94%	457.95%	14.86%	0.40	-16.79%	-50.95%	0.00%	1.00
60% Equity/40% Bonds	8.06%	471.98%	8.78%	0.68	-11.11%	-28.70%	3.33%	0.56
60/20/20 (Alts)	7.72%	433.29%	9.76%	0.58	-11.56%	-33.69%	2.32%	0.64
Permanent Portfolio	6.33%	297.60%	5.93%	0.72	-8.63%	-12.78%	4.48%	0.22
Ivy Portfolio	6.57%	318.90%	10.91%	0.41	-19.87%	-46.28%	1.83%	0.59
Risk Parity	6.42%	305.41%	5.35%	0.81	-9.06%	-15.11%	4.90%	0.18
David Swensen	7.17%	374.53%	10.01%	0.51	-16.03%	-37.61%	2.03%	0.62
El Erian	6.76%	336.13%	11.56%	0.41	-16.99%	-42.04%	1.20%	0.69
Rob Arnott	7.17%	374.68%	8.11%	0.63	-16.31%	-29.40%	3.69%	0.42
ScottBurns/AndrewTobias	6.67%	327.19%	10.53%	0.44	-15.67%	-38.54%	1.28%	0.66
Bernstein "SmartMoney"	6.68%	328.31%	9.20%	0.50	-13.02%	-34.92%	1.83%	0.58
Core Four Portfolio	7.40%	398.45%	11.31%	0.47	-18.14%	-44.92%	1.95%	0.67
Ideal Index	6.52%	314.25%	10.48%	0.43	-14.42%	-39.07%	1.19%	0.65
All Seasons (Ray Dalio)	7.32%	390.41%	6.61%	0.80	-9.67%	-14.42%	5.50%	0.22
60/20/20(SwanDRSat20)	8.11%	477.90%	9.78%	0.62	-11.91%	-30.88%	2.75%	0.64
SwanDefinedRiskStrategy (Net of Fees)	8.08%	474.89%	9.35%	0.64	-16.15%	-18.56%	5.59%	0.32

Exhibit 2 (Sources: Zephyr StyleAdvisor, Morningstar, Mebane Faber, and Swan Global Investments)

Worst period return equals worst one month return over the time period. No management fees are included except for the Swan DRS, based on the Swan DRS Select Composite, which is net of fees. One cannot invest directly in an index. Where indexes were used, expense ratios of acquired fund fees would be present if represented by actual investments seeking to track the indexes; thus investment returns would be lower for those portfolios. It is important to note that expense ratios would likely have been higher in prior years. Prior performance is not a guarantee of future results and there can be no assurance, and investors should not assume, that future performance will be comparable to past performance.





No management fees are included except for the Swan DRS based on the DRS Select Composite, which is net of all fees. One cannot invest directly in an index. Where indexes were used, expense ratios of acquired fund fees would be present if represented by actual investments seeking to track the indexes; thus investment returns would be lower for those portfolios. It is important to note that expense ratios would likely have been higher in prior years. Prior performance is not a guarantee of future results and there can be no assurance, and investors should not assume, that future performance will be comparable to past performance.

This 23 year period incorporates three equity bull markets and two bear markets. There are some interesting conclusions from looking at the long-term returns of these models. First, nine of the thirteen model portfolios fall within 88 basis points of each other from 5.96% to 6.83%. The four model portfolios that do not fall within this range represent the two best and worst performing portfolios, but all of the models fall within 173 basis points! Second, most model portfolios ended up with a standard deviation between 9% and 11%. In other words, the long-term results of most asset allocation models built by some of the most well-known, brightest, and respected leaders within investment management are scarcely distinguishable. This is most easily seen with a correlation matrix, showing how highly correlated most asset allocation models are to each other and to the S&P 500. Correlation measures how closely two different investments move in conjunction with one another; if one is seeking to diversify an investment portfolio, lower correlations or negative correlations are desired. This highlights in particular why asset allocation on its own does not mitigate systematic risk; assets can all go down together, and usually do in corrections especially for those highly correlated.

*In another study covering 1973 to 2018 from the book *Global Asset Allocation: A Survey of the World's Top Asset Allocation Strategies* by Meb Faber, dozens of popular asset allocation portfolios all fell within 2 percentage points of each other.



In Exhibit 4, red indicates a correlation between 0.70 and 1.00, with the darker shade of red indicating a correlation higher than 0.90. It is easily apparent from this matrix that Swan's DRS is unique from all the other asset allocation models from a correlation standpoint, and also has the lowest correlation to the S&P 500 at 0.47.

Correlation Matrix: July 1, 1997 through December 31, 2019	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1) S&P 500 TR	1.00	0.94	0.98	0.55	0.80	0.50	0.92	0.88	0.76	0.93	0.94	0.88	0.92	0.50	0.51
2) 60%/40%	0.94	1.00	0.98	0.67	0.82	0.72	0.93	0.88	0.83	0.93	0.92	0.90	0.91	0.73	0.52
3) 60/20/20 (Alts)	0.98	0.98	1.00	0.64	0.84	0.61	0.95	0.92	0.82	0.95	0.96	0.91	0.95	0.61	0.54
4) Permanent Port.	0.55	0.67	0.64	1.00	0.65	0.80	0.68	0.68	0.71	0.68	0.63	0.64	0.64	0.80	0.35
5) Ivy Portfolio	0.80	0.82	0.84	0.65	1.00	0.76	0.93	0.93	0.94	0.90	0.90	0.92	0.91	0.68	0.51
6) Risk Parity	0.50	0.72	0.61	0.80	0.76	1.00	0.72	0.70	0.84	0.69	0.63	0.71	0.65	0.94	0.38
7) David Swensen	0.92	0.93	0.95	0.68	0.93	0.72	1.00	0.96	0.91	0.98	0.97	0.97	0.98	0.67	0.52
8) El Erian	0.88	0.88	0.92	0.68	0.93	0.70	0.96	1.00	0.91	0.97	0.95	0.92	0.96	0.65	0.51
9) Rob Arnott	0.76	0.83	0.82	0.71	0.94	0.84	0.91	0.91	1.00	0.89	0.88	0.90	0.88	0.74	0.51
10) Burns/Tobias	0.93	0.93	0.95	0.68	0.90	0.69	0.98	0.97	0.89	1.00	0.96	0.94	0.97	0.65	0.51
11) Bernstein	0.94	0.92	0.96	0.63	0.90	0.63	0.97	0.95	0.88	0.96	1.00	0.96	0.99	0.57	0.54
12) Core Four	0.88	0.90	0.91	0.64	0.92	0.71	0.97	0.92	0.90	0.94	0.96	1.00	0.97	0.62	0.51
13) Ideal Index	0.92	0.91	0.95	0.64	0.91	0.65	0.98	0.96	0.88	0.97	0.99	0.97	1.00	0.59	0.51
14) All Seasons	0.50	0.73	0.61	0.80	0.68	0.94	0.67	0.65	0.74	0.65	0.57	0.62	0.59	1.00	0.34
15) Swan DRS	0.51	0.52	0.54	0.35	0.51	0.38	0.52	0.51	0.51	0.51	0.54	0.51	0.51	0.34	1.00

Exhibit 4 (Source: Zephyr StyleAdvisor)

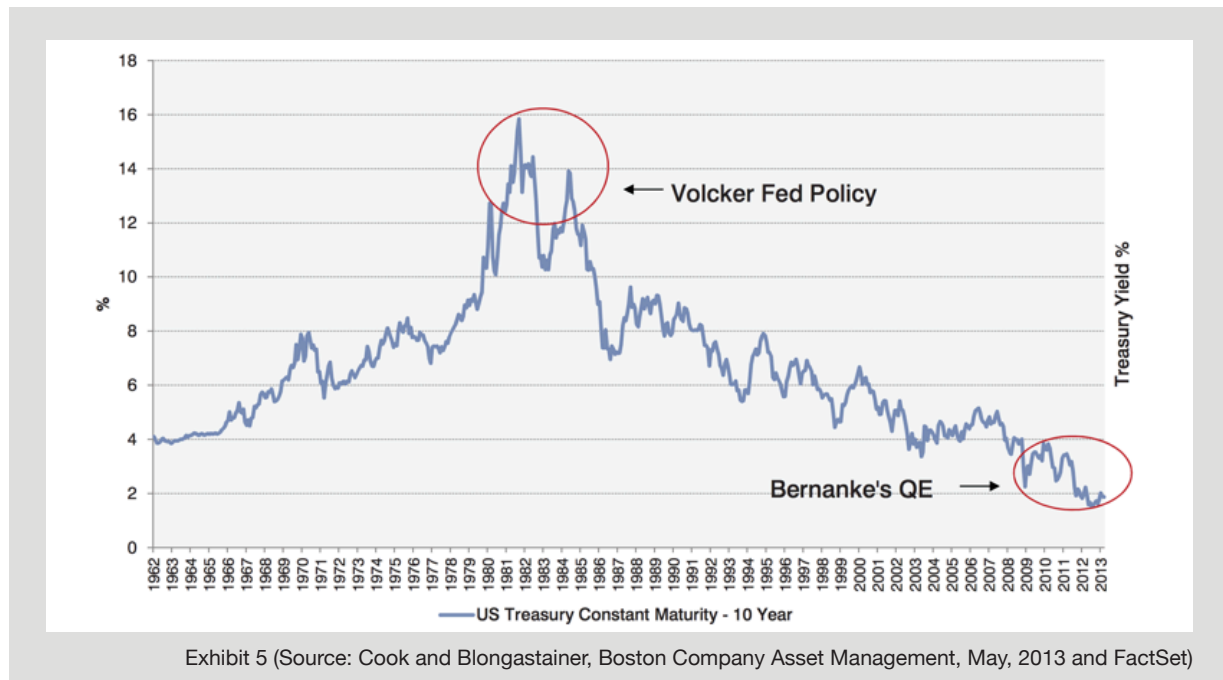
The Swan DRS Select Composite is net of fees; no fees have been included for all other models. Prior performance is not a guarantee of future results and there can be no assurance, and investors should not assume, that future performance will be comparable to past performance.

The similar characteristics and returns of these asset allocation portfolios begs the question whether a simpler and more direct method of investment might achieve the same, if not better, outcome. Of course, with investing there is no such thing as a one-size-fits-all model portfolio. Each investor has various goals and circumstances and unique risk tolerances. Variations of these models can be created depending on the investor's risk tolerance, time horizon, and return goals and more specific asset classes can be used to further differentiate. For this study, however, most of the asset allocation models included would be considered moderate or conservative in nature.



Granted, most of these asset allocation models did outperform the S&P 500 while also lowering volatility (and in some cases, drastically). It is apparent why these model portfolios are popular and the basis for so many investors' portfolios, even if they were impacted by the benefit of hindsight (past historical returns could have impacted the choice of the asset classes by those building the models).

However, it is important to note that these portfolios have an average allocation of 35.54% to fixed income. Exhibit 3 displays the fact that, U.S. fixed income had a very strong bull market during almost the entire 2-year time period tested for these portfolios. Interest rates have been falling over the past 35 years from 20 percent down to almost zero. It seems very unlikely that this 30+ year bond bull market can continue to provide similar returns going forward. Due to the heavy allocation to bonds in all of these model portfolios (ranging from a low of 14% to a high of 60%, with only two portfolios having less than 25% in fixed income), the possibility for a repeated large contribution from fixed income in the next 15-20 years is likely very low, if not impossible.



Consider a different scenario, if all of the fixed income positions were removed from the asset allocation models, the results and risk metrics show some interesting changes. This scenario is more of an apple to apples approach when comparing to the DRS since it is 100% equity-based. For all the asset allocation models, standard deviation changes to a range of 12-17% instead of 6-12%, a huge increase caused by the removal of the lower standard deviation positions of fixed income. Max drawdown increases greatly for all portfolios, with the lowest now at -25% and the second lowest at -43%, quite a change from -13% and -14% with fixed income. In addition, the Sharpe ratios for the asset allocation models drop drastically, with only one scoring greater than .50 (whereas previously, 8 models had a sharpe ratio greater than .50). On the other hand, if a portfolio consisted of 65% Swan DRS and 35% fixed income, standard deviation would have lowered to 6.28% (from 9.40%) and the Sharpe ratio would have increased from 0.70 to 0.87.



In summary, it is important to note the following:

- A bear market is necessary to complete a full market cycle.
- Currently both equity markets and fixed income markets carry substantial downside risk.
- There is risk of equity and fixed income being in a bear market at the same time.
- Swan's DRS has better returns than all of the popular model portfolios and lower standard deviation than most while also taking a simpler, more direct approach to risk.

ENHANCING ASSET ALLOCATION

All of these portfolios depend heavily on fixed income and many investors continue to shy away from the risk and growth potential of equities, well aware of the ever present market risk associated with the stock market. With this in mind then, how can one improve on asset allocation going forward?

Statistics: July 1, 1997 through December 31, 2019	Annualized Returns	Cumulative Return	Population Standard Deviation	Sharpe Ratio	Worst Period Return	Maximum Drawdown	Alpha vs. Market	Beta vs. Market
S&P 500 Total Return	7.94%	457.95%	14.86%	0.40	-16.79%	-50.95%	0.00%	1.00
Asset Allocation Average	7.08%	365.99%	8.43%	0.60	-13.80%	-30.97%	2.77%	0.51
AssetAllocationAveragew20%Swan	7.32%	390.06%	7.88%	0.67	-11.87%	-26.62%	3.31%	0.47
AssetAllocationAveragew40%Swan	7.54%	413.10%	7.71%	0.71	-11.22%	-22.88%	3.87%	0.43
AssetAllocationAveragew60%Swan	7.74%	435.00%	7.92%	0.72	-12.85%	-19.11%	4.43%	0.39
AssetAllocationAveragew80%Swan	7.92%	455.63%	8.49%	0.69	-14.50%	-16.68%	5.00%	0.36
SwanDefinedRiskStrategy(NetofFees)	8.08%	474.89%	9.35%	0.64	-16.15%	-18.56%	5.59%	0.32

Exhibit 6 (Sources: Zephyr StyleAdvisor, Morningstar, Mebane Faber, and Swan Global Investments)

No management fees are included except for the Swan DRS, based on the DRS Select Composite, which is net of all fees. One cannot invest directly in an index. Where indexes were used, expense ratios of acquired fund fees would be present if represented by actual investments seeking to track the indexes; thus investment returns would be lower for those portfolios. It is important to note that expense ratios would likely have been higher in prior years. Prior performance is not a guarantee of future results and there can be no assurance, and investors should not assume, that future performance will be comparable to past performance.

Based off of the results above, one might conclude that it would be easier to just allocate a portfolio 100% to the DRS: set it and forget it (especially in light of the state of fixed income and equity valuations). Of course, it is unlikely that any advisor is going to allocate 100% to the DRS. However, it is important to note that adding increments of the DRS to the portfolio may improve returns. Regardless, with a viable hedged equity alternative such as Swan's DRS, investors can take advantage of traditional equity exposure without potentially increasing risk. In Exhibit 6, the results shown are from adding various allocations of the Swan DRS to an average return of all 13 of the model portfolios listed above.



Integrating alternative strategies such as the DRS into a portfolio's equity and fixed income allocations should help diversify the risk exposures of that portfolio, potentially enabling it to be better positioned to face various market environments, especially those that have occurred since the late '90s. By adding the DRS as a major component in a portfolio, an investor can maintain equity exposure but limit its downside risk, thus being less dependent on fixed income. In fact, since inception of the DRS in 1997, all of the asset allocation strategies in this study could have increased return by adding an allocation to Swan's DRS—the greater the allocation, the greater the return.

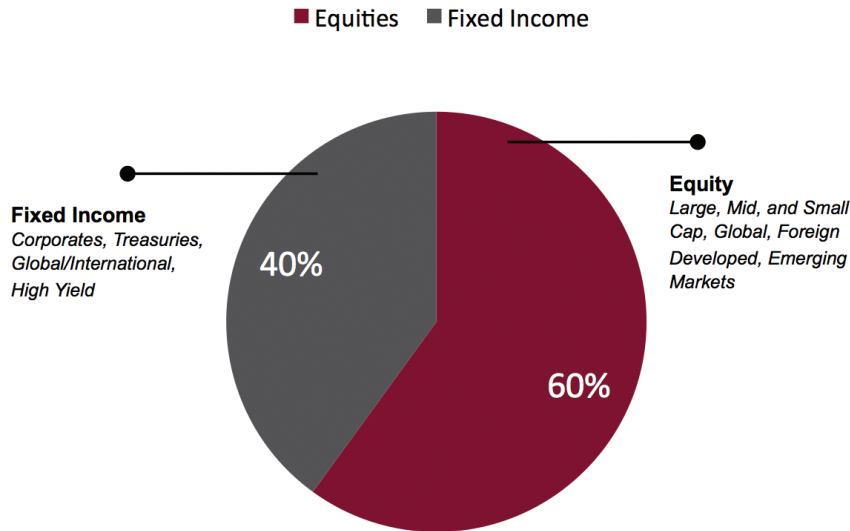
In essence, the DRS does what asset allocation is intended to do, except more efficiently and consistently. The DRS is a simpler solution than asset allocation, providing the same benefits of diversification (smoothing out returns, lowering volatility, improving returns, etc.). It is a simpler and easier solution to implement in that it generally requires less advisor/client analysis and effort, less trading and turnover cost, and potential improvement in tax impact. The DRS does this without depending on correlation assumptions, large exposures to fixed income, or complete exposure to systematic market risk.

This is due to the non-correlated movement of the long-term option puts used to hedge the equity portion of the DRS portfolio. Asset allocation seeks to “hedge” by diversifying into numerous positions that have historically over a long timeframe been non-correlated. The DRS seeks to hedge based on how the market operates (the fact that the market sometimes goes up and sometimes goes down), not based on past or future correlations. Swan believes that the true definition of hedging should be “purchasing a second investment that you know will perform in the opposite direction of your first investment—and the ability to define how much you want to hedge.” Hedging with options provides this framework of defined risk—something that other claimed forms of hedging (e.g., diversification) do not provide.

Because of this, an investor can potentially improve on asset allocation by repositioning some assets into a hedged equity product like the DRS as seen in Exhibit 6. The adjustments show the impact the DRS can have on a well-balanced asset allocation portfolio. Even something as simple as a 60/20/20 model with 60% to traditional equities, 20% to traditional fixed income, and 20% in the DRS provides improvement over all of the 13 model portfolios (see Exhibit 2). This hypothetical portfolio below (Exhibit 7) shows how an investor could take a traditional 60/40 portfolio and increase equity exposure (and lower fixed income exposure) while enhancing returns and lowering risk.



Traditional Asset Allocation



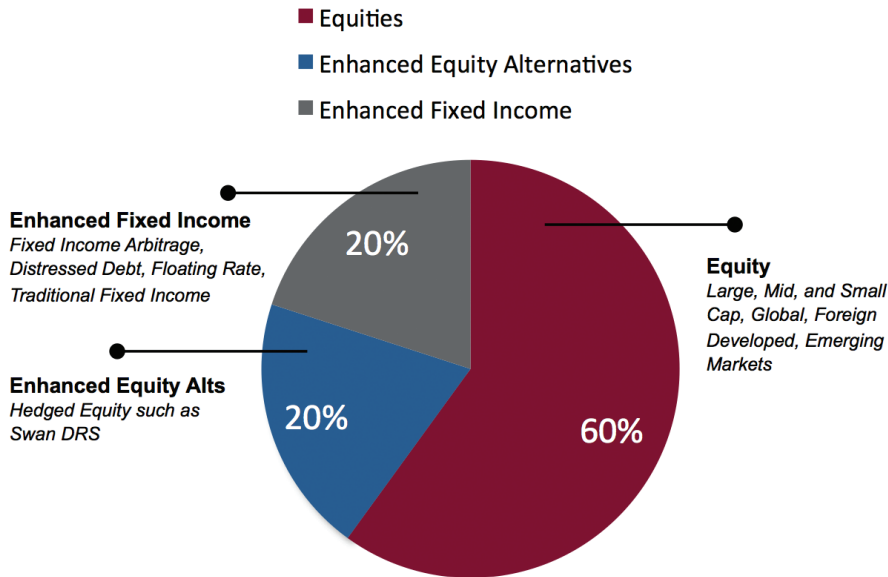
Traditional Portfolio Focus

- Diversification through asset class
- Benchmark oriented

Shortfalls of Traditional Portfolio Construction

- Market correlations are high
- May underestimate current or future market environment
- Backward-looking in construction
- Relies heavily on a fixed income bull market – Interest Rate Risk

Enhanced Asset Allocation



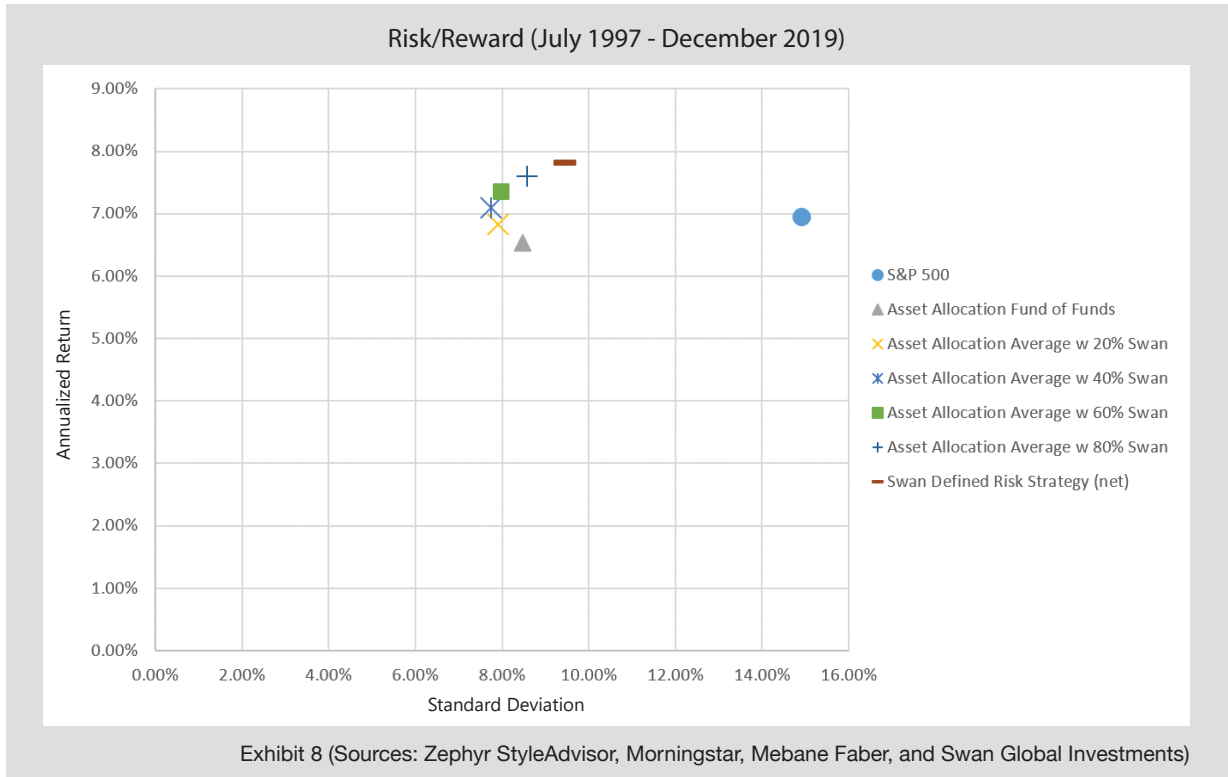
Enhanced Portfolio Focus

- Diversification through asset class and from traditional equity/fixed income
- Asset allocations less dependent on market movements

Consider the Benefits

- More resilient to inflation
- Diversifies risk exposure
- Considers multiple risk factors
- Does not rely heavily on a fixed income bull market
- Lowers volatility; increases return (historically)





No management fees are included except for the Swan DRS, based on the DRS Select Composite, which is net of all fees. One cannot invest directly in an index. Where indexes were used, expense ratios of acquired fund fees would be present if represented by actual investments seeking to track the indexes; thus investment returns would be lower for those portfolios. It is important to note that expense ratios would likely have been higher in prior years. Prior performance is not a guarantee of future results and there can be no assurance, and investors should not assume, that future performance will be comparable to past performance.



CONCLUSION

The information and analysis in this study is especially useful to investors and financial advisors that have built their portfolios around an MPT/asset allocation approach. With Swan's DRS, investors can increase traditional equity exposure to potentially optimize return without increasing risk. Furthermore, less of the portfolio will be dependent on historical correlations and open to systematic market risk. By potentially stabilizing returns and volatility, advisors can seek to increase traditional equity exposure for their clients. There are five key factors that make the DRS compelling (besides risk and return metrics) as compared to asset allocation models:

- Direct risk mitigation against market risk through put options vs indirect protection through diversification
- Transaction efficiency
- Tax efficiency
- Minimal interest rate risk
- Simplicity

It is vitally important for investors to consider the significance of systematic risk to long-term portfolio returns. Swan believes the only sure way to fully guard against systematic risk and potential significant losses is through hedging with carefully constructed, rules-based options strategies.

Swan believes that the DRS can mitigate risk, improve long-term returns, and lower volatility through its investment vehicles. Through the use of long-term puts combined with option income strategies to reduce hedging costs and increase upside participation, Swan seeks to provide one of the most compelling ways available to investors today to address the important matter of systematic risk, one that all asset allocators should consider as a potential enhancement to their portfolio.



IMPORTANT NOTES & DISCLOSURES

This communication is informational only and is not a solicitation or investment advice. Nothing in this presentation constitutes financial, legal, or tax advice. All information is subject to change or correction without notice. The charts and graphs contained herein should not serve as the sole determining factor for making investment decisions. To the extent that you have any questions regarding the applicability of any specific issue discussed to your individual situation, you are encouraged to consult with Swan. All information, including that used to compile charts, is obtained from sources believed to be reliable, but Swan does not guarantee its reliability. Swan's investments may consist of securities which vary significantly from those in the benchmark indexes listed above and performance calculation methods may not be entirely comparable. Accordingly, comparing results shown to those of such indexes may be of limited use. All Swan performance results have been compiled solely by Swan Global Investments and are unaudited. Other performance return figures indicated in this material are derived from what Swan believes to be reliable sources, but Swan does not guarantee its reliability. There is no guarantee the DRS structured portfolio investment will meet its objectives. This is not a guarantee or indication of future performance. References to the S&P 500 and other indices herein are for informational and general comparative purposes only. Indexes are unmanaged and have no fees or expenses. An investment cannot be made directly in an index. Investment strategies with other securities may vary significantly from those in the benchmark indexes listed. All investments involve the risk of potential investment losses as well as the potential for investment gains. Prior performance is no guarantee of future results and there can be no assurance that future performance will be comparable to past performance. All Swan products utilize the Defined Risk Strategy ("DRS"), but may vary by asset class, regulatory offering type, etc. Accordingly, all Swan DRS product offerings will have different performance results due to offering differences and comparing results among the Swan products and composites may be of limited use.

Swan Global Investments, LLC ("Swan") is an independent Investment Advisor headquartered in Durango, Colo. registered with the U.S. Securities and Exchange Commission under the Investment Advisers Act of 1940. Being an SEC-registered advisor implies no special qualification or training. Swan offers and manages its Defined Risk Strategy to individuals, institutions and other advisory firms. There are ten DRS Composites offered: 1) The DRS Select Composite which includes non-qualified accounts; 2) The DRS IRA Composite which includes qualified accounts; 3) The DRS Composite which combines the DRS Select and DRS IRA Composites; 4) The DRS Institutional Composite which includes high net-worth, non-qualified accounts that utilize cash-settled, index-based options held at custodians that allow participation in Clearing Member Trade Agreement (CMTA) trades; 5) The Defined Risk Fund Composite which includes mutual fund accounts invested in the S&P 500; 6) The DRS Emerging Markets Composite which includes mutual fund accounts invested in emerging markets; 7) The DRS Foreign Developed Composite which includes all research and development account(s), and mutual fund accounts invested in foreign developed markets; 8) The DRS U.S. Small Cap Composite which includes all research and development account(s), and mutual fund accounts invested in U.S. small cap issues; 9) The DRS Growth Composite which includes all research and development account(s), and mutual fund accounts invested in the S&P 500 equities; and 10) The DRS U.S. Large Cap Prime Composite, which includes all research and development account(s) invested in U.S. large cap equities.



Additional information regarding Swan's policies and procedures for calculating and reporting performance returns is available upon request. Swan claims compliance with the Global Investment Performance Standards (GIPS) and has prepared and presented this report in compliance with GIPS standard. Swan's compliance with GIPS has been independently verified from its inception on July 1, 1997 through December 31, 2018. A copy of the verification report is available upon request. To receive copies of the report please call 970.382.8901 or email operations@swanglobalinvestments.com. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation. The Defined Risk Strategy Select Composite demonstrates the performance of all non-qualified assets managed by Swan Global Investments, LLC since inception. It includes discretionary individual accounts whose account holders seek the upside potential of owning stock, and the desire to eliminate most of the risk associated with owning stock. The composite relies on LEAPS and other options to manage this risk. Individual accounts own S&P 500 exchange-traded funds, LEAPS associated with the ETFs, as well as option strategies based on other widely traded indices. The Defined Risk Strategy Select Composite includes all nonqualified discretionary accounts which are solely invested in the Defined Risk Strategy. The Defined Risk Strategy was designed to protect investors from substantial market declines, provide income in flat or choppy markets, and to benefit from market appreciation. Stock and options are the primary components of the strategy. The performance benchmark used for the Defined Risk Strategy is the S&P 500 Index comprised of 500 large-capitalization stocks, and which does not charge fees. 141-SGI-040320



ABOUT SWAN GLOBAL INVESTMENTS

Randy Swan started Swan Global Investments in 1997 looking to supply investment management services that were not available to most investors. Early in his financial career, Randy saw that options provided an opportunity to minimize investment risk.

His innovative solution was the proprietary Swan Defined Risk Strategy, which has provided market leading, risk-adjusted return opportunities through a combination of techniques that seek to hedge the market and generate market-neutral income.



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