

# The Next Generation ETF Student-Managed Investment Program

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**S**tudent-managed investment funds (SMIFs) are an experiential learning program typically located in the finance departments of many colleges and universities. The responsibility for managing money offers real-world experience, provides an immersion in real-time market data, and reinforces specific aspects of the undergraduate business curriculum. Most student funds use a “bottom-up” approach to portfolio construction. The educational virtue of this approach culminates in “stock picking,” an outcome that applies the valuation and financial statement analysis learned in finance courses. This article describes an alternative experiential learning model that is unique in two respects. First, we strictly use “top-down” analysis to develop and refine our portfolio. Top-down analysis relies on an understanding of macroeconomic themes. These themes guide asset allocations and decisions regarding the regional and sector orientation of a portfolio. Second, exchange-traded funds (ETF) are the only investment vehicle used to implement the portfolio’s investment themes. We are using this alternative model of the SMIF at the University of Richmond. In our Next Generation Fund (NXG), students began by investing \$25,000 in January of 2016 based on macro themes they developed during the fall of 2015. They then rebalanced the initial portfolio twice based on continuing

top-down analysis. In the following, we describe how we implemented a top-down ETF-focused SMIF program. A continuing goal of the program is to add increasingly sophisticated quantitative analysis. The article provides examples of some of our more sophisticated applications.

## WHY HAVE STUDENTS INVEST WITH ETFs?

The evolution of ETFs from their origin as index funds has greatly facilitated the use of a top-down investment approach by students. ETFs offer student investors the access and capabilities for global portfolio construction that were once only available to institutional investors. With ETFs, students can easily slice the investment universe by asset classes, subclasses, investment style, countries, regions, and sectors. Because each ETF is a portfolio of securities, diversification requires a smaller number of holdings and transactions. Wide exposure with a relatively low number of holdings allows active investing with a relatively small amount of capital. This fact is a key to expanding the ETF SMIF to a much wider range of schools.

Despite the virtues, there are constraints that advisors must consider when using ETFs with student managers. Although one of the purposes of a SMIF is to give responsibility and discretion to student

## EXHIBIT 1

### Transaction Cost for Annual Online Trading Given Size of Investment, Number of Holdings, and Market Return

\$25,000 Initial Investment	Market Return on the ETF	Amount Invested after \$6.95 Cost per Trade	Ending Investment Amount	Ending Wealth after \$6.95 Cost per Trade	Round Trip Transaction Cost
20 ETF Holdings	10%	\$24,861	\$27,347.10	\$27,208.10	117 bps
20 ETF Holdings	5%	\$24,861	\$26,104.05	\$25,965.05	114 bps
8 ETF Holdings	10%	\$24,944.40	\$27,438.84	\$27,383.24	46.7 bps
8 ETF Holdings	5%	\$24,944.40	\$26,191.62	\$26,136.02	45.6 bps

Notes: The Round Trip Transaction Cost equals the market return minus the realized return on the initial amount invested. For example:  $0.10 - [(\$27,208.10/\$25,000) - 1] = 117$  bps. The online trading fee for ETFs is \$6.95 for TD Ameritrade, Scottrade, and E\*Trade.

managers, advisors need to place some restrictions on the full range of ETFs available. As the ETF market has become more sophisticated, the complexity of many ETFs has increased. Student managers may not fully understand the risk and return characteristics of these more exotic ETFs. For example, we prevent trading in levered, inverse, levered-and-inverse, ETNs (exchange-traded notes), and any ETF with exposure to derivatives. However, we do not believe there is any consequence from these restrictions. The main purpose of our model is to apply curricular learning to construct a portfolio based on top-down analysis. A vanilla menu of ETFs is adequate for this purpose.

The costs of trading ETFs include the operating cost, the bid-ask spread, and trading costs. ETFs have low operating costs with expense ratios averaging roughly 45 basis points (bps). In general, these costs are much lower for the unrestricted ETFs than the restricted ETFs with leverage, derivatives, or commodity exposures. This is another reason for the restrictions noted. Electronic trading with Scottrade costs \$6.95 per trade, which is competitive with other online trading services.<sup>1</sup>

The ultimate cost of trading depends on the number of ETFs traded, frequency of trading, total amount invested, and return on the investment. Exhibit 1 illustrates these relationships for our \$25,000 fund. For example, the first row represents the costs of trading if students have a complete rebalance once a year, earn 10% return, and hold a portfolio of 20 ETFs. A reduction to only 8 ETF holdings reduces the trading costs from 117 bps to 46.7 bps. Combining ETFs offers rapid diversification without loss of intended exposures.

We learned this lesson in our inaugural portfolio that contained 24 ETFs. A subsequent analysis of the covariance of the movement of ETFs within this basket indicated that we could have obtained the desired exposures and diversification with less than 10 ETFs. This result reinforces our claim that ETFs are a very low cost vehicle for implementing the investment strategy derived from a top-down analysis.

Although ETFs do not require large investments, students are tempted to hold a large number of ETFs or turn the portfolio over frequently. Either impulse will place substantial drain on the performance of a fund with a small amount of capital. We apply three criteria that will minimize the drag of transaction costs on the portfolio: 1) We screen out ETFs with higher operating expenses and low liquidity; 2) we minimize the number of holdings consistent with an efficient portfolio; and 3) we adopt a longer-term investment horizon.

### A PRIMER ON "TOP-DOWN" ANALYSIS

Although students who participate are rigorously screened based on their course content and achievement in those courses, they are unlikely to have more than the vaguest notion of top-down analysis. Exhibit 2 summarizes our introduction of top-down stages for students. Stage 1 emphasizes the global macroeconomic conditions that must be examined for regions and countries when choosing asset class and sector allocations. In Stage 2, a synthesis of student research leads to identification of an investment thesis with respect to the most attractive assets, subclasses of assets, regions,

## EXHIBIT 2

### Stages in NXG's Active ETF Portfolio Construction

Stage I Global Macro Analysis by Region and Country	Stage II Investment Thesis (Desired Factor Exposures)	Stage III ETF Screener (Consistent with Thesis)
GDP/Growth Prospects	Key Drivers/Catalysts	Eliminate Restricted Funds*
Interest Rates	Asset Class Mix	Eliminate Low Liquidity
Inflation Rates	Developed vs. Developing	Reduce Undesired Exposures
Currency Strength	Industry/Sector Balance	Seek Best in Category
Balance of Payments		
Spreads (credits, maturity, etc.)		
Commodity Prices		
Political Risk		
Stage IV Identify Optimal ETF Mix	Stage V Validate Factor Exposures	Stage VI Performance Review and Analysis
Benchmark Weights	Time Series of Factor Data*	Attribution Analysis*
Target Risk Tolerance	Factor Regressions*	Sharpe Index*
Set "Intuitive" Sector Weights	Consistency with Thesis*	
Construct Efficient Frontier*	Review IV If Inconsistent	
Identify ETF Combinations*	Purchase Portfolio If Consistent	

\*The quantitative analysts specialize in these activities.

countries, and overall drivers of asset values. Selection of ETFs consistent with the investment thesis occurs in Stage 3 with a heavy reliance on ETF screening capabilities.<sup>2</sup> At the end of Stage 3, students have a list of desired ETFs that match the investment thesis and pass screens for liquidity, size, sector exposure, and restrictions imposed by faculty advisors.

Experienced students with quantitative analysis skills work with student managers in Stage 4 to identify the desired combination of ETFs and weights. Applications of Markowitz efficient portfolio algorithms play a large role in this process, but we are in the early stages of that process. Currently, students are learning how factor investing may enhance their ETF selection process and are applying regression analysis to measure sensitivities of the selected portfolio to the desired macroeconomic factors. Finally, in Stage 6 the quantitative analysts monitor performance using a simple attribution analysis model. The attribution analysis allows learning from breaking down returns to identify decisions that went well or not well. If the attribution analysis shows poor performance, the challenge is to decide if more time would allow the thesis to develop more fully or if the thesis was misguided and needs to be revised.

### PERFORMANCE BENCHMARK AND THE INVESTMENT POLICY STATEMENT

Instinctively, students are inclined to assess their performance relative to some broad and popular index such as the S&P 500 Index. We emphasize early that an investment policy statement defines the target investor for the fund and the nature of that clientele should influence the weights assigned to each asset class in the portfolio. Since our fund represents endowment money with no liquidity requirement, students set the long-run weight for cash at zero. We could move to cash in cases where a safe haven investment fits the larger macroeconomic thesis, but this would be the exception in our case. The long-run nature of an endowment matched with a characteristic willingness of youth to take more risk led to a 70% weight on equities and 30% weight on fixed income. Students understood that this asset mix is mildly aggressive but suitable for their client (i.e., the endowment), which typically has a longer investment horizon for a significant portion of its assets.

The benchmark not only reflects the fund's investment philosophy but also is investable and measurable. Students wanted a diversified passive

benchmark portfolio with wide exposure over different equity subclasses and countries. The MSCI ACWI ETF provides a suitable benchmark with these required characteristics.<sup>3</sup> ACWI tracks large and mid-cap equities in developed and emerging markets covering 64 countries and representing 85% of the global investable equities. A sector breakdown of the ACWI fund also allows benchmarking for active rotation of sector weights in accordance with the investment thesis.<sup>4</sup> The Vanguard Total Bond market ETF (BND) represents the passive index for fixed income.<sup>5</sup> Students chose this index based on high liquidity as well as the broad mix of long and intermediate bonds.

Students gain focus and a better understanding of the direction of the fund by writing an investment policy statement (IPS). This statement required several iterations in our case as students narrowed their focus from a wide range of assets to only equity, fixed income, and cash. Students researched and invested in a wide range of asset classes in early versions of the IPS, but they discovered inherent complications in researching so many different asset class with different characteristics. Students eventually recognized that their equity, fixed income, and cash exposures are sensitive to commodity prices, currencies, real estate and other factors that may be used in setting the portfolio without investing in all asset classes directly. The IPS for our fund appears in Appendix A.

## EXAMPLE OF CONSTRUCTING AND EVALUATING THE ETF PORTFOLIO

To illustrate the investment process and performance evaluation, we use the student ETF portfolio from the most recent rebalance on June 1, 2017. Students conducted research on global macroeconomic themes and met each week to synthesize their work. Appendix B illustrates a general framework used by students to link larger macroeconomic themes to the most attractive sectors. Students provided detailed reports and presentations for their respective research groups and defended their suggestions to faculty advisors and the student group. Appendix C provides a brief summary of key points that survived the discussions prior to the June 1, 2017, rebalancing decision. Students suggested favorable and unfavorable conditions for specific countries and regions as well as for specific sectors. The portfolio that emerged from the rebalancing

discussion is an “intuitive” selection of ETFs consistent with the themes from Appendix C.

Improved global and U.S. growth expectations prompted students to increase the weight on equities above the 70% benchmark. Historically, equities perform best in the early to middle stages of a growth cycle. Student had mixed outlooks on this point because the current economic conditions are not following a typical inventory-adjustment type of business cycle. Nevertheless, the student consensus considered the global economy to be in the early-middle phase where equities would outperform fixed income. The asset allocation tilt resulted in an overall goal of 85% allocation to equities and 15% allocation to fixed income. The ETF screener allowed students first to screen down the universe of ETFs based on investment restrictions and geographic market goals. A second screening based on liquidity, operating cost, and sector exposures allowed additional focus to narrow the field. The final ETF selections and proposed weights that students believed best fit the overall thesis appear in Exhibit 3.

There was low turnover from the prior portfolio. Nevertheless, there were a few notable changes. An expected improvement in both U.S. and global growth over the next two years, compared with prior expectations in the last rebalance, motivated students to increase the weight of consumer cyclicals and industrials. The view that oil prices would remain low prompted students to lower the weight on energy. Country and region allocations remain stable with the exception of an increase in exposure to India.

## THE OPTIMAL COMBINATION OF ETF CHOICES

The list of ETFs and weights in Exhibit 3 represents the “intuitive” portfolio that students wanted to hold. Before trading, students in the quantitative analysis group experimented with modern portfolio theory to see whether the ETFs and weights in Exhibit 3 resulted in an efficient portfolio. Looking backward is not ideal, but students wanted to examine the risk and return relationships of their portfolio to identify potential redundant holdings that might allow them to reduce the number of ETFs they would trade. Using the Bloomberg Professional Service, students collected monthly price data starting in December of 2013 until the last week in December of 2016. Only 20 of the

## EXHIBIT 3

### ETF Portfolio after Selection and Screening but before Optimization

Symbol	Name	Type	Weight
ARGT	Global X Argentina	Equities	3.17%
EIDO	iShares MSCI Indonesia	Equities	6.68%
EPP	iShares MSCI Pacific ex Japan	Equities	4.68%
EWT	iShares MSCI Taiwan Capped	Equities	5.10%
EWV	iShares MSCI Mexico Capped	Equities	3.14%
FNI	First Trust Chindia	Equities	8.02%
FXEU	PowerShares Europe Currency Hedged	Equities	4.92%
FXR	First Trust Industrials/Producer Durables	Equities	3.81%
INDA	iShares MSCI India	Equities	7.05%
INXX	Columbia India Infrastructure	Equities	2.80%
ITA	iShares U.S. Aerospace and Defense	Equities	5.72%
KBE	SPDR S&P Bank	Equities	5.39%
PEJ	PowerShares Dynamic Leisure and Entertainment	Equities	3.23%
SOCL	Global X Social Media	Equities	2.76%
VHT	Vanguard Healthcare	Equities	5.19%
VNM	VanEck Vectors Vietnam	Equities	5.20%
XLU	SPDR Sector Select Utilities	Equities	3.27%
XLY	SPDR Sector Select Consumer Discretionary	Equities	6.30%
LEMB	iShares EM Local Currency Bond	Fixed Income	6.23%
EMCB	WisdomTree EM Corporate Bond	Fixed Income	2.51%
JNK	SPDR Bloomberg Barclays High Yield Bond	Fixed Income	4.81%
<b>TOTAL</b>			<b>100%</b>

21 ETFs had complete data for this period, making it necessary to drop FXEU from the analysis. Students also collected monthly price data over the same period for the benchmark index funds, ACWI and BND.

Students explored the Markowitz efficient portfolio analysis of their intuitive portfolio. While there are several different ways to calculate expected returns for each ETF, a simple capital asset pricing model (CAPM) provided their initial analysis. Students made beta estimates for each ETF, defined as the covariance of the ETF return and the ACWI return divided by the variance of the ACWI return. Students estimated monthly expected rates of return using the 10-year Treasury yield as the risk-free rate and the long-run average of the spread between the ACWI return and the risk-free rate as the equity risk premium in the CAPM. Further refinement of this approach is under way, based on multifactor models and time series models to measure expected returns, but the concept is the same. We wanted to see where the student's intuitive portfolio performed relative to the Markowitz efficient set of portfolios offering the lowest standard deviation

for a given expected return. Exhibit 4 illustrates the efficient set with maximum volatility from investing 100% in VHT and minimum volatility by investing 100% in XLU.

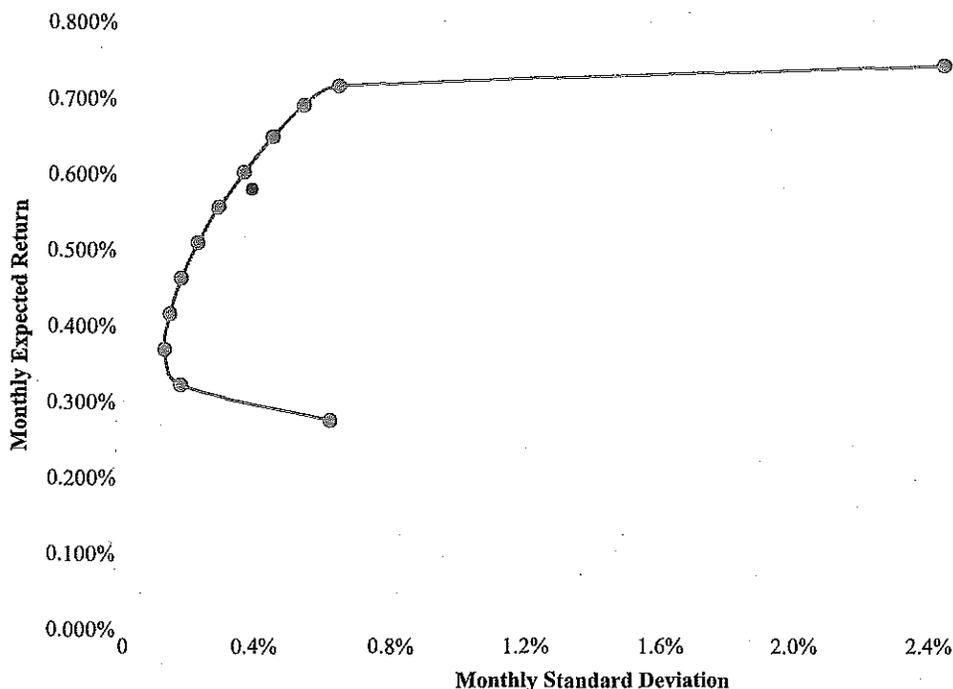
The set of 20 ETFs with the suggested weights from the intuitive selection in Exhibit 3 appears as a dot below the efficient set in Exhibit 4. For the same level of risk (standard deviation) a slightly higher expected return occurs by holding a smaller mix of ETFs (only eight in this case) that would put them on the efficient set line. We did not require students to adopt this new portfolio, because the efficient set analysis is still an ongoing tool to be refined. However, students learned about added diversification potential due to covariances of ETFs that may not be intuitive. Eventually, we will track both the intuitive and efficient portfolios to see if the Markowitz analysis adds value and reduces trading.

### PERFORMANCE ATTRIBUTION ANALYSIS

For a deeper analysis, we asked students to develop an attribution model to calculate returns attributed to

## EXHIBIT 4

### Markowitz Efficient Set of ETF Portfolios (January 2014–December 2016)



Source: Bloomberg Professional Service.

each active trading decision in their portfolio relative to a passive benchmark.<sup>6</sup> Because the portfolio constructed on June 1, 2017, has not had enough elapsed time for this analysis, the students decided to “back test” the attribution model. As a practice run-through, they assumed the same thesis used to construct the portfolio in Exhibit 4 was in place since January 2014 and developed the model to break down performance through December 2016. At this point, the model results are available only for the equity portfolio breakdown, but a similar model is soon to be available for breaking down the BND portfolio into relevant sectors. The plan is to use these models at each rebalance point going forward, but the back-test allowed students to fine-tune the workings of the attribution model.

The attribution analysis for the back-test appears as Exhibit 5. Overall, a passive portfolio using the 70/30 weight on the ACWI and BND indexes had an annual return of 5.43%, while the student portfolio with active asset allocation, active sector weights, and selected ETFs earned an annual return of 3.11%. Students were to

identify where the underperformance of 2.32% came from. The first step compared the gain or loss due to moving the asset allocation weights from the 70/30 long-run benchmark, everything else equal. Panel A of Exhibit 5 shows the asset allocation decision added 96 bps from the higher weight on equities. Panel B shows the difference in performance due only to differences in sector weights of the ACWI equity index and the sector weights of the student equity portfolio. The columns with asterisks represent sectors where the students’ active decision added value. Students either underweighted a sector that underperformed the overall equity return of 7.4% annual rate of return or overweighted a sector that overperformed 7.4%. Overall, students gave back 65 bps of performance due to sector weight decisions.

The data in Panel C of Exhibit 5 summarize the value added from asset allocation, sector weights, and selection of ETFs. The last column represents the value added from ETF selections, which was a negative 262 bps. The net value added from all student decisions in Panel C represents the overall 232 bp underperformance of the active student portfolio compared with simply

## EXHIBIT 5

### Back-Test Attribution Analysis of the NXG Student Portfolio

Panel A: Asset Allocation Performance

	Equity Index (ACWI)	Fixed Income (BND)	Passive Benchmark (70/30 mix)	NXG Active Asset Allocation with Passive Sector and ETF Selection (84.3/15.7 mix)	NXG Active Asset Allocation Value Added
Annual Rate of Return	7.4%	0.82%	5.43%	6.38%	0.95%

Panel B: Sector Weight Attribution Analysis

	Basic Materials*	Cons. Cyclical	Cons. Defensive	Commun.*	Energy*	Finance	Health Care	Industrial	Tech.	Utilities	Real Estate*	Other
Benchmark Sector Weights	5.15%	12.30%	9.71%	3.36%	6.19%	17.89%	11.19%	10.76%	17.11%	3.20%	3.14%	0.00%
NXG Sector Weights	4.34%	18.04%	5.15%	3.35%	3.25%	19.24%	8.15%	15.25%	12.74%	5.88%	2.42%	2.18%
Sector Return	-9.37%	6.84%	7.66%	-7.20%	-19.75%	2.53%	12.52%	3.95%	30.48%	2.72%	5.83%	0.00%

Panel C: Attribution Model Summary of Value Added due to Asset Allocation, Sector weights, and ETF Selection

Passive Allocation and Passive Return	Active Allocation and Passive Return	NXG Active Allocation Value Added	Active Allocation and Passive Sector Weight	Active Allocation and Active Sector Weight	NXG Sector Weight Value Added	Active Allocation, Active Sector, Passive ETF Selection	Active Allocation, Active Sector, Active ETF Selection	NXG ETF Selection Value Added
5.43%	6.38%	0.95%	6.38%	5.73%	-0.65%	5.73%	3.11%	-2.62%

Notes: The asterisks in Panel B identify sector decisions that add value (overweighting sectors that outperform the equity index or underweight sectors that underperform the equity index). The shaded columns in Panel C represent net value added for the separate asset allocation decision, sector weight decision, and ETF selection, respectively.  $NXG$  total performance over the back-test lagged the benchmark by  $5.43\% - 3.11\% = -2.32\% = 0.95\% - 0.65\% - 2.62\%$ .

buying the 70/30 asset mix with passive index holdings. The ETF selection clearly represented the largest underperformance due to decisions made in constructing the portfolio. While this is a back-test over a period with a different macroeconomic thesis, it is representative of the performance analysis going forward at each rebalance point. We believe this will be an important learning tool to complement standard risk and return performance measures.

### CONCLUSIONS AND CAVEATS

Colleges and universities now have easy access to the technology, data, and guidance by investment professionals required to provide practical investment experience for students. The student-managed fund we present is evolving in a new direction for college funds by applying more quantitative analysis of the broader portfolio and by using ETF investments. This approach is a fertile area for both practice and learning in higher education. Our approach to a SMIF is also unique in

that it expands this experiential learning format beyond what has traditionally been an exercise for finance students. Economics students with macroeconomic, industry, and econometric skills are well suited for the analysis and application required for investing with ETFs.

Many facets of our ETF approach remain a work in progress. We have made more progress on the "intuitive" ETF selection process than on the more quantitative analysis process we envision for the fund. However, the examples we present are starting points for the use of efficient portfolio construction and attribution analysis. The launch of factor analysis is not far behind. Unlike real world investment practice, we move slowly as students learn from mistakes of their predecessors and work on corrections. Although we are in the formative stages, we are looking for added insight and guidance from professional ETF investors as we work to improve the investment process. We have a lot to learn and welcome all comments and suggestions from readers of this journal.

## APPENDIX A

### NXG STUDENT-MANAGED ETF FUND INVESTMENT POLICY STATEMENT

Portfolio:	University of Richmond Endowment
Location:	Richmond, Virginia
Tax ID:	Tax Exempt
Asset Value:	\$25,000
Holdings:	Equity, Fixed Income, and Cash Exchange Traded Funds (ETFs)
Restrictions:	No holdings with leverage, inverse structure, or derivative exposure
Return Goal:	Outperform a Benchmark defined as 70% (MSCI's Global Equity Fund, ACWI) +30% (Vanguard's Total Bond Fund, BND)

**Portfolio selection guidelines.** NXG's performance depends on selected asset class performance, portfolio sector weights, and specific ETFs within asset and sector classifications. NXG tilts the equity, fixed income, and cash asset mix around the 70/30/0 long run target. Global exposures follow from macroeconomic themes likely to unfold over the 2-year investment horizon. Sector weights deviate from the weights in the passive index funds to reflect expected opportunities, given the macroeconomic thesis. Specific ETFs selected for the portfolio survive a rigorous screening process to find the best ETF within a classification.

Historically, stock assets offer higher rates of return along with greater volatility than fixed income or cash assets. The portfolio uses diversification to moderate risk and seeks the maximum return per unit of risk expected in the markets.

NXG uses geographic diversification combined with efficient portfolio algorithms to construct the portfolio. Investments in exchange-traded funds (ETFs) provides added diversification opportunities without holding large numbers of securities.

#### Investment objectives:

- Enhanced return consistent with an intermediate time horizon of 2 to 3 years.
- Risk profile: Moderate with a tilt toward above market risk when warranted
- Short term liquidity needs: None
- Annual Rate of Return Expectation: 8% (based upon global equity and bond return expectations and pension fund actuarial assumption)
- ETF selections with minimal transaction costs.

#### Duties and responsibilities include:

- Annual reporting requirements with periodic updates for the Advisory Board. Ongoing weekly updates and consultations with faculty advisors.
- Selection of assets to achieve efficient diversification of risk and returns.
- Control trading costs with low turnover and screening to find lowest operating cost funds.
- Monitor all investments using prudent buy and sell discipline to minimize turnover consistent with a 2-year investment horizon.
- Trades executed through Scottrade at the lowest available online commission.
- Annual and mid-year reports on holdings, trading activity, and change in value.
- Strictly adheres to investment restrictions, which excluding levered, reverse, reverse-levered, ETNs, and ETFs with derivative holdings and characteristics.

## APPENDIX B

### SECTOR WEIGHTING LINKED TO PHASES OF THE MACROECONOMIC CYCLE

Cycle Phase	Macroeconomic Conditions	Links to Sectors	Overweight Sectors	Underweight Sectors
Early Expansion	Sharp recovery, positive growth, rate of growth picks up, credit eases, margins expand, profit growth, low inventories, sales growth picks up	<i>GDP:</i> Growth rebounding <i>Inflation:</i> Low <i>Interest Rates:</i> Low <i>Unemployment:</i> High <i>Wages:</i> Low <i>Sentiment:</i> Low but rising	Consumer Discretionary Industrials Technology Credit Cyclical Capital Goods Cons. Cyclical.	Utilities Financials Telecomm. Health Care Cons. Staples
Mid Expansion	Longest phase of the cycle, moderate but sustained growth, momentum in activity, credit more available, easy monetary policy moves to neutral, inventory and sales grow, inventory/sales ratio about equal to long run average	<i>GDP:</i> Growth Sustained <i>Inflation:</i> Rising <i>Interest Rates:</i> Rising <i>Unemployment:</i> Falling <i>Wages:</i> Low growth <i>Sentiment:</i> Rising	Technology Industrials Capital Goods Credit Cyclical Industrials	Materials Utilities

(continued)

## APPENDIX B (continued)

### SECTOR WEIGHTING LINKED TO PHASES OF THE MACROECONOMIC CYCLE

Cycle Phase	Macroeconomic Conditions	Links to Sectors	Overweight Sectors	Underweight Sectors
Late Expansion	Overheated economy, inflation picks up above trend, growth rate slows, monetary policy becomes restrictive, credit becomes tight, profit margins narrow, inventories build, and sales fall.	<i>GDP</i> : Peak flattening <i>Inflation</i> : High <i>Interest Rates</i> : Low <i>Unemployment</i> : Low <i>Wages</i> : Improving <i>Sentiment</i> : Peaked	Materials, Capital Goods, Health Care, Energy, Utilities, Cons. Staples	Cons. Discr., Cons. growth, Technology
Recession	Contraction with negative growth rates, profits decline and credit is tight at all levels, monetary policy becomes accommodative, sales fall with lagging inventory reductions.	<i>GDP</i> : Falling (negative) <i>Inflation</i> : Falling <i>Interest Rates</i> : Falling <i>Unemployment</i> : Rising <i>Wages</i> : Falling from peak <i>Sentiment</i> : Falling	Consumer Staples, Utilities, Health Care, Telecomm.	Cap. Goods, Cons. growth, Cons. Cycl., Basic Ind., Technology, Materials, Financials

## APPENDIX C

### SUMMARY OF THE ECONOMIC ANALYSIS DRIVING THE NXG INVESTMENT THESIS

Key Components of the Outlook	Favorable	Unfavorable
<p><b>U.S. Economy</b> (Mid to Late Expansion): We expect continued slow but sustained growth (GDP growth of about 2.5% compared with long-run 3.2% potential). Unlike a mid to late expansion economy, we expect continued low interest rates and low inflation (unlike normal conditions in middle to late expansion). A reversal of past Fed policy moves is likely, leading to higher short-term rates. Long-term rates are likely to remain low (bond prices high) from capital account surplus due to strong dollar and relatively stronger U.S. demand for goods. A flatter yield curve is likely.</p> <p>Job growth remains strong and the unemployment rate is likely to be at full employment (about 4.2%). But, a low labor force participation rate of about 62% represents untapped potential. Wages lag full employment and should begin to improve in 2017. Consumer sentiment should remain strong. Households have gained wealth from refinancing and high equity values. Nevertheless, wages have been flat and limits to consumer spending will keep GDP growth low.</p> <p>Private investment spending should finally pickup as the prospect of higher long-term rates in the future prompt investment now. Manufacturing and industrial production have been sluggish but improvements are likely as the economy moves into the later stages of an expansion. Capacity utilization remains low, but obsolescence and automation should lead to more investment.</p> <p>Obamacare is imploding without billions of additional federal dollars. A repeal and replace plan is promised but unlikely to gain widespread support. Obamacare increased the demand for services without meaningful increases in supply, and insurers are leaving the markets due to uncontrolled costs. Risks are high in healthcare investments.</p> <p><b>Global Economy</b>: Deflationary pressures are likely to continue. Oil prices are not likely to drift much above \$50 in 2017. High debt service from past fiscal deficits constrain expansionary fiscal policies going forward. Central bank expansion and historic low levels of interest rates may not have much impact. The low interest rate, low growth rate, low commodity prices, and low inflation rate scenario is likely to continue.</p> <p>Geopolitical risks in the Ukraine, Middle East, and Korea are high and may derail a global recovery. Low commodity prices, debt in hard currencies, trade imbalances, and slow global growth limit growth in emerging economies.</p>	<p>Cons. Cyclical Financials Industrials Utilities</p>	<p>Basic Materials Consumer Defensive Energy Health Care Technology Real Estate</p> <p>Emerging Markets Middle East Korea</p>

(continued)

## APPENDIX C (continued)

### SUMMARY OF THE ECONOMIC ANALYSIS DRIVING THE NXG INVESTMENT THESIS

Key Components of the Outlook	Favorable	Unfavorable
<p><b>Europe:</b> A slow recovery from a recession is likely if easy money policies take hold. Inflation and interest rates will remain very low but there is a risk that the economy will not be responsive to low rates. Fringe countries like Italy, Greece, Spain, and Portugal will continue to struggle with a disjointed set of policies compared to their large debt overhang. Trouble in the Ukraine and immigration/migration from the Middle East will put a strain on all countries in the region. Brexit issues will take time to work through all European countries. At this point, European investments appear risky.</p>		Europe in general
<p><b>China:</b> Growth is “planned” to be about 7% while the issue of internal debt quality is addressed. Slow growth hurts emerging economies that depend on exports to China. India will continue with internal reforms needed to make financing and investment decisions more productive. Nevertheless, India’s growth rate will far surpass the global average of about 3.5%.</p>	China India	
<p><b>South and Central America:</b> Argentina is working through reforms that move to a more efficient and market-oriented economy. It will take time but prospects for an improved economy are good. Brazil will continue to struggle with inflation and balance of payments issues. There are no signs of significant reforms. Improvement in the economy hinges on increased global demand for commodities. Mexico suffers from low oil prices but exports to the U.S. should get a boost from the strong dollar relative to the peso. Other developing economies in the region, much like Brazil, depend on a stronger global economy and demand for raw materials.</p>	Argentina Mexico	Brazil Economies in the Region
<p><b>Japan:</b> Japan’s struggles over the past two decades may slowly improve. Chronic issues with an aging population, limited resource base, loss of competitive advantage in technology, and protective trade relations represent obstacles to rapid growth. Investment in Japan hinges on the view that the economy may not be as bad as analysts think.</p>		
<p><b>Vietnam, Indonesia, and Taiwan:</b> Key emerging economies in Southeast Asia are in a position to grow faster. Trade agreements to link the economies in the region will help.</p>		

### ENDNOTES

<sup>1</sup>See [www.scottrade.com](http://www.scottrade.com).

<sup>2</sup>There are a number of good sources for ETF screening. We used the following online screener: <http://etfdb.com/screener>.

<sup>3</sup>For more information on the MSCI ACWI ETF, see <https://www.msci.com/documents/10199/a71b65b5-d0ea-4b5c-a709-24b1213bc3c5>.

<sup>4</sup>See <https://www.msci.com/sector-indexes>.

<sup>5</sup>See [www.etf.com/BND](http://www.etf.com/BND).

<sup>6</sup>Calculating returns attributed to regions in the ACWI is not possible because one cannot dissect the index on this level of detail.

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