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## OVERCOMING THE CHALLENGES OF ESTABLISHING A STUDENT-MANAGED FIXED INCOME FUND

David Krause, Marquette University

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*Student-managed funds (SMFs) offer unique educational opportunities. In a typical SMF, students select common stocks and manage a real portfolio, gaining practical money management experience. Until recently, establishing a fixed income SMF has been unworkable for most academic institutions. Fixed income exchange traded funds (ETFs) are relatively new financial offerings that allow non-institutional investors the ability to trade shares of an entire bond portfolio as a single security. By combining different ETFs into a fund of funds, it is possible for students to implement various bond portfolio management strategies – a valuable learning opportunity previously unavailable to most business students.*

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### INTRODUCTION

Student-managed funds (SMFs), which are composed almost exclusively of common stock, offer unique educational opportunities for business students. In the typical SMF, students select stocks and manage a real portfolio, gaining practical money management experience. Several studies (Lawrence, 1990; Lerro and Mallett, 2001; and Neely and Cooley, 2004) have described SMFs and documented their growth from only a few funds in the early 1990s to over 120 by 2004.

The growth of SMFs is not surprising given that students obtain considerable benefits from this form of practical, experiential learning. Students in SMFs generally develop a solid understanding of the equities market and the techniques of fundamental common stock analysis. They also gain valuable experience working in teams and delivering professional quality presentations (Szczerbacki, Duserick, Rummel, Howard, and Viggiani, 2000). It has been reported that another major benefit accruing to students who participate in SMFs is the increased interaction with advisory board members, who are typically associated with the local investment community (Neely, 2004). Additionally, SMFs are growing because they are assisting academic institutions in improving alumni and public relations, increasing fund raising opportunities, and providing admissions offices with exciting offerings that help attract prospective students.

Although fixed income securities account for about half of all investment holdings in the U.S., SMFs focus almost entirely on common stock. The main reasons that common equities are utilized in SMFs are a function of the ease of obtaining public information, the low cost of transacting, and the relative effortlessness of creating and managing a stock portfolio. For example, a reasonably diversified student-managed fund of common

stock can be established by an academic institution for as little as \$10,000.

### Challenge of Creating a Fixed Income SMF

Establishing a fixed income student-managed fund is significantly more challenging than an equity-only fund for a number of reasons. The major explanation is purely financial – it has been estimated that the threshold level for establishing a meaningful training program in fixed income management is several million dollars (Fox, 1998). Creating a portfolio of individual bonds has other drawbacks including high trading expenses, limited diversification, increased management and recordkeeping costs, and sophistication of the market.

### High Trading Expenses

Assuming that funding for a fixed income SMF has been obtained, one method that can be utilized to control transaction costs involves the direct acquisition and ownership of U.S. Treasury securities. For a nominal fee, a large discount broker can be used to attain practically the same terms that institutional investors obtain at Treasury auctions.

Another option to control trading costs is to buy Treasury bonds on the open market. If a SMF follows that route, the students need to be careful to watch the broker markups. For instance, on a \$50,000 Treasury bond trade through a discount broker, the stated commission might be as low as \$50. However, it is possible that an additional \$250 might be paid in the form of a markup over the wholesale value of the bonds. Similarly, it could cost the SMF another \$250 or more in the form of a markdown to get rid of Treasury bonds in the secondary market if the bonds are sold before maturity. On smaller purchases (i.e. under \$10,000), it is

likely that the broker markup will be in excess of 1% every time a Treasury security is bought or sold by the SMF. Non-Treasury bonds are relatively expensive to transact; even with careful trading, purchase costs are likely to amount to about 1.5% to 2% of the bonds' price. Selling smaller lots of non-Treasury bonds is even more expensive, with commissions totaling 2% to 3%, since brokers usually have a much lower market demand for odd sized lots.

A study of average bid-ask spreads (Huang and Stoll, 1997) found that the large capitalization common stocks had an average spread of about 0.60%, while small cap stocks had average spreads approaching 2.0%. Lower spreads for bonds have been reported (Chakravarty and Sarkar, 2003) with an average bid-ask spread for municipal bonds of 0.22%, versus 0.21% and 0.11% for corporate bonds and government bonds, respectively. However, despite the lower average bid-ask spread for bonds, it has been observed that fixed income securities with lower credit ratings had trading spreads that were as much as two to three times greater than investment grade bonds. It should be noted that the net result is that the transactions costs of fixed income securities can be significant, especially for smaller lots of lower credit, non-Treasury bonds.

### **Limited Diversification**

Another limitation of using fixed income investments in SMFs is the limited diversification. While large institutions and mutual funds can own dozens or even hundreds of fixed income issues, the SMF will likely be limited to a handful of bonds because of the size of the portfolio. This is likely to limit the SMF to investments in only high-quality corporate or government bonds, since it is typical that a large number of speculative grade bonds must be held to reduce default risk to a negligible level. Because minimum lot transactions of \$100,000 are typical for asset-backed fixed income securities, it is probable that most SMFs would be unable to hold these investments, further limiting portfolio diversification.

The non-investment grade bond market also can experience highly unstable trading periods. During times of high volatility, the wholesale bid-ask spreads on some non-Treasury issues can widen to as much as 5%. In short, as smaller investors, such as SMFs, seek fixed income securities in areas other than the U.S. Treasury market, the case for direct ownership of bonds becomes much weaker.

### **Increased Management and Recording Keeping**

Another practical reason why fixed income investing for a SMF is challenging relates to the rigor involved with managing the portfolio. Investing in individual bonds is far more difficult than an all-equities fund. Unlike common stocks, bonds accumulate accrued interest, which managers must account for monthly. Also, since bond interest is received regularly, managing and reinvesting the cash flows can be an issue. Because the SMF is not likely to be able to buy a new bond every time interest income is received, the portfolio will likely experience a cash drag. Other administrative issues include early retirement for bonds with call and sinking fund provisions, which could also add to cash drag.

### **Sophistication of the Market**

A final challenge facing fixed income SMFs is the sophistication of the market (Kallberg, Liu, and Trzcinka, 2000). Large institutional investors, such as pensions and mutual funds, dominate the market. They can easily extend and shorten durations based on their interest-rate forecasts and quickly react to major events. Professional investors are likely to have greater access to more current and detailed information pertaining to specific bond issues than student investors. Unlike common stock, where considerable information about the underlying company is available to the investing public to evaluate, bond data is much harder to obtain. While many students understand the process of conducting a fundamental stock analysis, few have had an opportunity to conduct a thorough credit analysis. Therefore, professional fixed income investors are generally acknowledged as being superior in searching out undervalued bonds than the general investing public.

## **CASE FOR FIXED INCOME ETF'S**

### **Exchange Traded Funds (ETF's)**

One of the fastest growing investment products among retail and institutional investors is the exchange trade fund. ETFs are structured like index mutual funds but are listed and traded on exchanges like stocks. These instruments are well-diversified, liquid, and can be utilized to suit a variety of investor objectives. The features of these relatively new financial assets provide some significant benefits that are well suited to the strategic needs of many investors, including student-managed portfolios.

The number and type of ETFs offered is on the rise as investors demand more ways to focus and diversify their investments. As a result, smaller investors can now easily spread their funds across a broad array of asset classes and investment styles, including:

- Major equity and fixed income indices, including many of their respective sub-sectors;
- Specific market capitalization ranges, including large-, mid- and small-cap stocks;
- Various investment styles, such as growth, core, and value stocks;
- Countries or entire regions, such as Asia, Europe and Latin America;
- Individual sectors, such as real estate, technology, energy, and healthcare; and
- Securities sharing particular characteristics, such as dividend income or high social responsibility measures.

Exchange traded funds are a type of investment company whose investment objective is to achieve the same return as a particular market index. Similar to an index mutual fund, ETFs primarily invest in all or a representative sampling of the securities that are included in a selected market index. For example, one type of ETF, known as Spiders (SPDRs), invests in all of the stocks contained in the S&P 500 Stock Price Index. On the other hand, the Lehman Aggregate Bond ETF (AGG) invests in only 123 (1.9%) of the 6,404 holdings that are contained in the Lehman Brothers Aggregate Bond Index.

Although ETFs are legally classified as open-end companies or unit investment trusts (UITs), they are different in that they do not sell individual shares directly to investors and only issue their shares in large blocks (e.g. 50,000 shares) that are known as "Creation Units." Investors generally do not purchase Creation Units with cash; instead, they buy Creation Units with a basket of securities that generally mirrors the ETF's portfolio. Those who purchase Creation Units are frequently large asset management firms. After purchasing a Creation Unit, the firm often splits it up

and sells the individual shares on a secondary market. This permits smaller investors to purchase individual shares (instead of Creation Units).

Investors who want to sell their ETF shares have two options. They can sell individual shares to other investors on the secondary market, or they can sell the Creation Units back to the ETF. In addition, ETFs generally redeem Creation Units by giving investors the securities that comprise the portfolio instead of cash. So, for example, an ETF invested in the stocks contained in the NYSE 100 Index Fund (NY) would give a redeeming shareholder the actual 100 securities that constitute the NY instead of cash. Because of the limited redeemability of ETF shares, they are not considered to be - and may not call themselves - mutual funds.

An ETF, like any other type of investment company, will have a prospectus. All investors who purchase Creation Units must be offered a prospectus. Some ETFs also deliver a prospectus to secondary market purchasers while others provide investors a document known as a Product Description, which summarizes key information about the fund. As of September 2006, there were almost 300 ETFs available to the investing public.

### Fixed Income Exchange-Traded Funds

Fixed income ETFs have been designed to track the performance of specific bond market indices. A bond market index is a statistical composite, created and maintained by a financial institution, which tracks the performance of the overall bond market or of a specific sector (government, corporate, or mortgage-backed), maturity range or credit quality within the larger market. As shown in table 1, there were six different fixed income ETFs offered as of September 2006. Barclays Global Investors is the sole provider of the six iShares™ fixed income ETFs. Of the six, three track Lehman Brothers' U.S. Treasury bond indexes of varying maturities: one follows Goldman Sachs' corporate bond index; another tracks the broad U.S. investment-grade bond market; and one tracks U.S. Treasury inflation-protected securities (TIPS), which are fixed-income instruments that are adjusted for inflation.

Table 1: Fixed Income ETFs

Fixed Income ETF Name	Symbol	Inception Date
GS S InvesTop™ Corporate Bond Fund	LQD	7/22/2002
Lehman 1-3 Year Treasury Bond Fund	SHY	7/22/2002
Lehman 20+ Year Treasury Bond Fund	TLT	7/22/2002
Lehman 7-10 Year Treasury Bond Fund	IEF	7/22/2002
Lehman Aggregate Bond Fund	AGG	9/22/2003
Lehman TIPS Bond Fund	TIP	12/4/2003

Goldman Sachs has created and maintains several fixed income indices. The GS \$ InvesTop™ Corporate Bond Index is a basket of 101 bonds, rebalanced monthly, designed to provide a balanced representation of the U.S. dollar investment grade corporate market through some of the most liquid corporate bonds available. All 101 bonds in the basket are equally price-weighted in returns. The GS \$ InvesTop™ Corporate Bond ETF replicates this index.

Lehman Brothers also is one of the leading providers of fixed income benchmarks. The Lehman Brothers Aggregate Bond Index is an unmanaged market index representative of the investment grade, U.S. taxable fixed income universe. While the index contains 6,404 different bond holdings, the Lehman Aggregate Bond Fund ETF contains only 123 holdings – with a statistical tracking error of less than 0.5%. The other Lehman Brothers bond indices, which are unmanaged, market-weighted representations of various U.S. Government debt securities having different maturities, are replicated by the other fixed income ETFs shown in the table.

The prices of the fixed income ETFs are affected by the same factors that influence bond prices:

- Changes in interest rates (falling interest rates mean rising bond prices and vice versa);
- Changes in yield spreads (the difference between the yield of a U.S. Treasury security and other types of bonds with comparable maturity);
- Changes in the yield curve (the relationship among yields of bonds with different maturities).

Fixed income ETFs usually distribute monthly dividends which can include both interest income on the underlying bonds and capital gains. Unlike bonds, ETFs have no maturity date. Although the bonds within the various ETFs eventually mature, the proceeds are reinvested in new bonds rather than returned to investors. For ETF investors to get their principal back is to sell their shares. The price received for the ETF may be more or less than what was paid, depending on the direction of interest rates and other bond market conditions in the interim. Table 2 shows the total returns of the six fixed income ETFs since their inception and for calendar year 2006 on a cumulative and annualized basis. The ETF returns were highly correlated with the reported returns of the respective bond indices.

**Table 2: Fixed Income ETF Returns**

Fixed Income ETF Name	Total Returns (%) as of 6/30/2006		
	Since Inception (Cumulative)	Since Inception (Annualized)	2006 (Annualized)
GS \$ InvesTop™ Corporate Bond Fund	20.83	4.92	-3.39
Lehman 1-3 Year Treasury Bond Fund	7.48	1.85	1.66
Lehman 20+ Year Treasury Bond Fund	22.84	5.36	-8.37
Lehman 7-10 Year Treasury Bond Fund	13.79	3.33	-3.64
Lehman Aggregate Bond Fund	7.03	2.48	-1.07
Lehman TIPS Bond Fund	9.89	3.73	-1.83

As shown in table 3, as of September 2006, almost \$20 billion was invested in fixed-income ETF assets; an amount that has been doubling annually. Because ETFs closely mirror their respective indices with regard to

duration, yield to maturity, and average credit rating - and there is little performance difference - managed accounts increasingly are turning to these less costly fixed income investment alternatives.

**Table 3: Fixed Income ETF Profile Date (as of 9/30/2006)**

Fixed Income ETF	Expense Ratio	Holdings	Total Net Assets (\$000)	Effective Duration (Years)	Average Yield to Maturity (%)	Average Credit Rating (Moody's)
GS \$ InvesTop™ Corporate Bond	0.15%	101	\$2,627,237	6.02	5.48	A2
Lehman 1-3 Year Treasury	0.15%	23	\$5,157,584	1.67	4.69	TSY
Lehman 20+ Year Treasury	0.15%	13	\$1,370,360	13.00	4.79	AGY
Lehman 7-10 Year Treasury	0.15%	11	\$1,654,714	6.45	4.60	AGY
Lehman Aggregate Bond	0.20%	123	\$3,964,927	4.98	5.29	AA1
Lehman TIPS Bond	0.20%	21	\$3,915,723	6.02	4.65	TSY

## Benefits of Fixed Income ETFs

Fixed income ETFs trade on stock exchanges, whereas bonds are generally bought and sold through dealer firms. Trading on a stock exchange means that investors can execute trades just as they would with any listed stock. Also, intraday price quotes and trading histories for ETFs are available in the same manner as for listed stocks. Another benefit of fixed income ETFs is that they allow for more granularity than investments in fixed income mutual funds, and they provide greater transparency of the actual holdings.

Investors can execute trading strategies in fixed income ETFs that may be cumbersome using bonds themselves. For example, ETFs can generally be sold short just as any listed stock, and for most fixed-income ETFs, there are actively traded call and put options available to individual and institutional investors. This is crucial since short sales and options on individual bonds generally are not available to non-institutional investors.

Fixed income ETFs are easier to use and more cost efficient than laddering; the strategy of buying individual bonds of varying maturities. The liquidity and transparency of a fixed income ETF offers advantages over a passively held bond ladder. For example, bond ETFs offer instant diversification and a constant duration, which means an investor needs to make only one trade to establish a fixed-income portfolio. A bond ladder, which requires the purchase of individual bonds, does not offer this luxury. In summary, for the student-managed fund where it makes little sense to establish an actively managed bond fund, ETFs which closely track bond indices offer an excellent alternative.

## Creating a Fixed Income ETF (Fund of Funds)

A fund which invests in other portfolios (i.e. mutual

funds, ETFs, and hedge funds) is referred to as a fund of funds. Just as an ETF or mutual fund invests in a number of different securities, a fund of funds holds shares of different funds. As a result, a fund of funds achieves even greater diversification than traditional mutual funds. However, on the downside, expense fees on a fund of funds can be higher because of the extra layers of management. In addition, since a fund of funds buys many different funds which themselves invest in many different securities, it is possible for the fund of funds to overlap or own the same securities through several different funds, making it a challenge to keep track of the overall holdings.

Because ETFs have extremely low expense ratios, the fund of funds approach to fixed income investing is an ideal option for student-managed portfolios. As discussed in a previous section, the idea of purchasing individual non-Treasury bonds is infeasible for SMFs with limited funding. Relatively small sized SMFs (under \$500,000) will find it difficult to execute individual bond trades at institutional pricing levels. Other issues include the inability to gain access to deep and liquid inventories and to obtain a prudent level of diversification.

The construction of a fixed income fund of funds employing ETFs does not preclude SMF members from making decisions like those of active bond portfolio managers. It is possible to conduct top-down analysis and establish fixed income duration and allocation strategies with regard to forecasted interest rate movements, yield curve shifts, and changing credit spreads. Note, in a rising interest-rate environment, the asset allocation of the fund of funds could be shifted to those ETFs with shorter durations, such as shown in table 4. (The appendix contains the steps necessary to establish a student-managed fixed income fund).

**Table 4: Hypothetical Shorter Duration SMF Fixed Income Portfolio**

Fixed Income ETF	Symbol	SMF Weighting	Fund Category	Average Duration	YTM	Investment
iShares Lehman 1-3 Year Treasury Bond	SHY	50.0%	Short Govt	1.69	4.96	\$500,000
iShares Lehman 7-10 Year Treasury	IEF	10.0%	Inter Govt	6.44	5.09	\$100,000
iShares Lehman 20+ Year Treas Bond	TLT	0.0%	Long Govt	12.74	5.31	\$0
iShares Lehman Treas Inflation Adj Bond	TIP	10.0%	Govt Infl Adj	6.30	5.98	\$100,000
iShares GS \$ Inves Top Corp Bond	LQD	10.0%	Long Corp	6.19	5.89	\$100,000
iShares Lehman Aggregate Bond Index	AGG	20.0%	Bond Index	4.74	5.65	\$200,000
<b>SMF Portfolio</b>		<b>100.0%</b>		<b>3.69</b>	<b>5.31</b>	<b>\$1,000,000</b>
<b>Lehman Aggregate Bond Index</b>				<b>4.74</b>	<b>5.65</b>	

Student analysts also can monitor and make asset allocation decisions involving individual sectors of the fixed income market (i.e. Treasuries, Agencies, mortgage-backed securities, investment and speculative grade corporate bonds, and foreign sovereign bonds).

For example, if credit spreads between corporate bonds and Treasuries are expected to narrow, an asset allocation towards a larger mix of corporate securities potentially could earn above average returns, as shown in table 5.

**Table 5: Hypothetical Higher Yield SMF Fixed Income Portfolio**

Fixed Income ETF	Symbol	SMF Weighting	Fund Category	Average Duration	YTM	Investment
iShares Lehman 1-3 Year Treasury Bond	SHY	5.0%	Short Govt	1.69	4.96	\$50,000
iShares Lehman 7-10 Year Treasury	IEF	5.0%	Inter Govt	6.44	5.09	\$50,000
iShares Lehman 20+ Year Treas Bond	TLT	5.0%	Long Govt	12.74	5.31	\$50,000
iShares Lehman Treas Inflation Adj Bond	TIP	40.0%	Govt Infl Adj	6.30	5.98	\$400,000
iShares GS \$ InvesTop Corp Bond	LQD	40.0%	Long Corp	6.19	5.89	\$400,000
iShares Lehman Aggregate Bond Index	AGG	5.0%	Bond Index	4.74	5.65	\$50,000
<b>SMF Portfolio</b>		<b>100.0%</b>		<b>6.28</b>	<b>5.80</b>	<b>\$1,000,000</b>
Lehman Aggregate Bond Index				4.74	5.65	

### Benefits of Fixed Income ETF's for Student-Managed Funds

The expansion of the ETF universe into the bond market in 2002 increased the opportunities to incorporate fixed income securities of different maturities and credit quality into SMFs. Because each fixed income ETF seeks results that correspond to the price and yield performance of its underlying index, these instruments are a convenient way for SMFs to allocate assets to fixed income securities and implement various strategies.

The benefits of ETFs make them an excellent asset allocation alternative to individual bonds and bond mutual funds. Unlike individual bonds, fixed income ETFs provide diversification with one trade, transparency of pricing throughout the day on an exchange, and low minimum investments. When fixed income ETFs are compared to most bond mutual funds, they offer the benefits of intraday pricing and trading, transparency of holdings, and lower expense ratios. Additionally, because most investors do not have easy access to bond prices, as they do with common stocks, it is difficult to verify the prices paid to brokers for individual bonds. Because fixed income mutual funds are only priced once a day, the continuous pricing of fixed income ETFs allows non-institutional investors greater transparency and the ability to view intraday pricing and trading volumes.

Finally, since ETFs can be purchased on margin and sold short (even on a down tick, unlike common stocks), smaller investors, such as SMFs, can use interest rate risk management strategies once available only to large institutional investors. For example, fixed income ETFs can be sold short to hedge interest rate fluctuations or to balance a portfolio. In a rising interest rate environment, profits from a short position could offset some of the capital losses in the long portion of the portfolio.

### Potential Areas of Future Research

Many universities have utilized various forms of SMFs and investment clubs over the years. However, no post-graduation research of students or employers has been conducted to follow up on the long-term value of these experiential learning opportunities. In addition to this potential opportunity, other post-graduation research can be conducted to determine whether students found their involvement with a SMF to be beneficial in obtaining employment in the money management industry. Research also can focus on the overall risk-adjusted return performance of SMFs relative to appropriate benchmarks. Finally, research on the use of the new fixed income ETF call and put options to manage portfolio risk can be conducted.

### CONCLUSION

Student-managed funds offer unique educational opportunities. In a typical SMF, students select common

stocks and manage a real portfolio, gaining practical money management experience. Until recently, establishing a fixed income SMF has been unworkable for most academic institutions. Fixed income exchange traded funds (ETFs) are relatively new financial offerings that allow non-institutional investors the ability to trade shares of an entire bond portfolio as a single security. By combining different ETFs into a fund of funds, it is possible for students to implement various bond portfolio management strategies – a valuable learning opportunity previously unavailable to most business students.

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## Appendix

### Steps to Establishing a Student-Managed Fixed Income Fund

The following checklist summarizes the required steps to establish a student-managed fixed income fund:

1. Identify the client's objectives and constraints
2. Develop an investment policy
3. Develop an internal control system
4. Establish an investment outlook and strategy
5. Analyze the yield curve
6. Select investment instruments
7. Monitor the markets and investment performance
8. Report results
9. Adjust and rebalance the portfolio accordingly

#### Step 1: Identify Client's Objectives and Constraints

Working with the client, identify the primary investment characteristics leading to a formal investment policy. Key characteristics that should be considered include: 1) a clear understanding of the client's expectations regarding the preservation and protection of capital; 2) legal constraints, if any, need to be identified to avoid investments which violate state or federal regulations; and 3) time horizon, cash flow and liquidity needs must be understood prior to investing.

#### Step 2: Develop an Investment Policy

Similar to other investment professionals, it is necessary for the student managers to establish written investment policies with the client. Formal policies help the client and students understand the nature of the investment process and risk-return relationship. Investment policies should include the following elements:

- Explicit statements of the client's investment objectives, preferences, statutory constraints and liquidity requirements, summarizing the findings from step 1.
- Identify and document the process for making and approving investment decisions.
- Identify the investment horizon and specific cash flow needs.
- Determine the allowable investment instruments. The list should identify the universe of potential fixed income securities from money market funds to Treasury securities to exchange traded funds to index mutual funds.
- Identify the benchmark (i.e. Lehman Brothers Aggregate Bond Index).
- Establish the allowable range of asset allocations (i.e. establish the allowed +/- range of deviations allowed relative to each of the asset sector weights). If U.S. Government securities constitute 40% of the benchmark, it is necessary to establish the upper and lower range which must be held in the portfolio.
- Establish the allowable range of average duration or maturity of the portfolio. For instance, the client might require that the average duration is +/- 20% of the benchmark's average duration.
- The investment policy should include guidance on diversification in terms of the percentage of funds invested in a single class of securities and maturities.
- Establish an acceptable level of default risk by requiring a minimum level of average credit rating (i.e. A+).
- Other investment policies should consider internal controls, documentation of investment decisions, and reporting investment results.

#### Step 3: Develop an Internal Control System

It is necessary to create a process of documenting investment decisions, transactions, reconciliations, and monthly reporting. These records should be held for at least five years.

**Step 4: Establish an Investment Outlook and Strategy**

The student managers should study the macro-economic outlook and establish forecasts of key economic statistics (i.e. GDP, inflation, unemployment, consumer spending, capital expenditures, consumer confidence, and interest rates). Based upon the forecast and the length of the holding period, an investment strategy should be developed to meet the client's investment objectives.

**Step 5: Analyze the Yield Curve**

The yield curve, which is a plot of the interest rates of bonds with different maturities, describes the relationship among short-, medium-, and long-term rates at a given point in time. Because it is the starting point for developing a fixed income securities strategy, it is necessary for the student managers to develop a forecast of the future movement of the yield curve. The student managers also should pay close attention to the shape of the yield curve as an indicator of the economic impact of current and future monetary policy.

**Step 6: Selecting Investment Instruments**

Fixed income securities should be selected to meet the investment objectives, especially those that provide broad diversification for the client. A full range of fixed income investments should be considered, from fixed income mutual funds to exchange traded funds to individual bonds and money market instruments, to help meet the client's goals. Indexed bond mutual funds and ETFs offer student managers a convenient way to invest in fixed income securities. For many student-managed funds, ETFs and index mutual funds provide a better option than individual bonds because they provide liquidity, are well diversified, and are offered at reasonable fees. Student managers should strive to create a widely diversified, low-cost portfolio that meets the client's needs.

**Step 7: Monitor the Markets and Investment Performance**

Student managers have a wide range of on-line information to monitor the fixed income markets and the performance of their client's portfolio. Monitoring the markets while keeping abreast of the economic and geo-politic events that affect them can provide a valuable learning tool for the students. Because so many factors influence the fixed income markets, the student managers have the ability to view real-time the impact that new economic, political, and company news have on the markets.

**Step 8: Report Results**

On a daily basis, the student managers track the performance of their fixed portfolio and the success of their investment strategy. Monthly, the students compute and report portfolio risk-return statistics to the client. These written reports are distributed to other investment professionals for feedback and advice. Several times during the semester the student managers present orally to the client and an investment advisory board.

**Step 9: Adjust and rebalance the portfolio accordingly**

Depending upon any changes made to the economic outlook and interest rate forecast, the student managers may occasionally revise their strategy and adjust the fixed income holdings accordingly. Any adjustments to the portfolio must be presented to the client prior to the portfolio being rebalanced. The students are required to document their assumptions and any changes to the portfolio.