Personal Finance: Another Perspective

Investing 6:
Mutual Fund Basics

Updated 2018-10-30
Objectives

• A. Understand the advantages and disadvantages of mutual funds
• B. Understand the major types of mutual funds
• C. Understand the major classes of mutual fund shares
• D. Understand how to calculate mutual fund returns
• E. Understand the process of how to buy a mutual fund
• F. Understand the costs of investing in mutual funds
• G. Understand plans and strategies for mutual funds
Investment Plan Assignments

• Investments 6: Mutual Fund Basics
  • 1. Develop criteria that you can use to select a good mutual fund, index fund, or ETF for your portfolio
  • 2. Using that criteria and Using Morningstar to Select Funds (LT07) pick one mutual fund minimum for each of your 4 asset classes (I recommend you have at least 4 asset classes minimum for diversification purposes), i.e., Emergency Fund, Core, Diversify, etc.
• For a spreadsheet with some ideas and a way to record Fund criteria, see Mutual Fund Selection Worksheet (LT7B)
Investment Plan Assignments (continued)

• Investments 8: Selecting Assets
  • 1. Using your criteria for good mutual funds, use Morningstar or other programs to select mutual funds for each of your asset classes
  • 2. Print off the Snapshot page from Morningstar or other resources for each of your chosen Funds or assets (as well as for any mutual funds you may already own)
  • 3. Include the chosen Fund names in your Exhibit 2: Investment Process Worksheet (TT13) with your target allocations
  • 4. Assemble your completed Investment Plan including Exhibit 1 (LT23) and Exhibit 2 (LT13)
A. Understand the Advantages and Disadvantages of Mutual Funds

• What is a Mutual Fund?
  • A way of holding financial and real investments
  • An Investment company that pools money from investors to buy stocks, bonds, and other financial investments
    • Investors own a share of the fund proportionate to the amount of their investment divided by the total value of the fund

• Why were they developed?
  • To give smaller investors access to professional management and to increase the assets of mutual fund companies
Mutual Funds (continued)

• What are the advantages of Mutual Fund Investing?
  • Diversification
    • While owning a single stock or bond is very risky, owning a mutual fund which holds numerous securities can reduce risk significantly
  • Professional management
    • Picking your own stocks and bonds to put in your portfolio and to hopefully beat your benchmarks is difficult and time consuming. Hiring a mutual fund to make those decisions for you can be beneficial and save time
Mutual Funds (continued)

• Minimal transaction costs
  • Buying individual stocks and bonds is expensive in terms of transactions costs. Mutual funds enjoy economies of scale in purchases and sales due to size

• Liquidity
  • Buying and selling individual stocks and bonds takes time. Money from open-end mutual funds can be received in two business days

• Flexibility
  • Individual stocks and bonds are not flexible. With many mutual funds, you have more flexibility and can often write checks on your account
Mutual Funds (continued)

- Low cost
  - “No-load” mutual funds are sold without a sales charge and are redeemed without a charge as well
- The ability to purchase and sell at Net Asset Value
  - “Open-end” mutual funds can be purchased and sold each day at the fund’s Net Asset Value, which is the fund’s assets less liabilities, divided by the number of shares outstanding
- Service
  - Mutual funds generally offer service to answer questions, help you open accounts, purchase and sell funds, and to transfer funds as well.
Mutual Funds (continued)

• In addition, they may include:
  • Automatic investment and withdrawal plans
  • Automatic reinvestment of interest, dividends, and capital gains
  • Wiring and funds express options
  • Phone switching
  • Easy establishment of retirement plans
  • Check writing
  • Bookkeeping and help with taxes
Mutual Funds (continued)

- What are the disadvantages of Mutual Fund Investing?
  - Active risk of lower-than-market performance
    - From 1987-2016, the average annual returns of actively managed stock funds underperformed the return of the S&P 500 stock index. Not all mutual funds outperform their benchmarks, and taxes take a significant part of investor returns (Dalbar QAIB 2017).
Mutual Funds (continued)

Percentage of Actively Managed Funds Which Underperformed their Benchmarks 2002-2017

Mutual Funds (continued)

- High costs
  - Unless analyzed carefully, management and other fees can be significant. Moreover, many mutual funds have “loads” or sales charges and 12-b1 fees which all reduce returns.
Mutual Funds (continued)

• Other Risks
  • Mutual funds are subject to both market and stock related risks, particularly in concentrated portfolios

• Inability to plan taxes
  • Mutual funds pass through 95% of all capital gains and dividends to the shareholders
    • Even if you do not sell your mutual fund, you can have a significant tax bill each year if your mutual fund trades often and has dividends, interest or capital gains

• It is difficult to plan for taxes when the tax decision is taken by the portfolio manager, not you
Mutual Funds (continued)

• Premiums or Discounts
  • “Closed-end” mutual funds may trade at a premium to (more than) or discount (less than) the underlying Net Asset Value (NAV). These premiums or discounts may be based more on investor demand than the underlying shares value

• New investor bias
  • New investors dilute the value of existing investor’s shares. Since new money comes into the fund at Net Asset Value, and since this money must be invested (at roughly 0.5% on average in the U.S.), existing investors are subsidizing new investors coming into the fund
B. Major Types of Mutual Funds

• What are the major types of Mutual funds?
  • The types of mutual funds generally follow the major asset classes
    • Money market, stock, and bond mutual funds
  • Others specialty funds
    • Index funds
    • Exchange Traded Funds (ETFs)
    • Balanced funds
    • Asset allocation funds
    • Life-cycle funds
    • Hedge funds
Types of Mutual Funds (continued)

• Money market mutual funds
  • Money market mutual funds are funds which invest the majority of their assets in short-term liquid financial instruments such as commercial paper and government treasury bills
  • Their goal is to obtain a higher return, after fees and expenses, than traditional bank savings or checking accounts
Types of Mutual Funds (continued)

• Stock mutual funds
  • Stock mutual funds are funds which invest a majority of their assets in common stocks of listed companies (8,293 U.S. stock funds as of 8/12/16 – Morningstar)
  • These funds generally have a specific objective, i.e. “large-cap,” “small-cap”, “value,” “growth,” etc. which relates to the types of stocks the mutual fund invests in
    • Their goal is either to outperform their relative benchmarks or to have a consistently high total return
Types of Mutual Funds (continued)

• Bond mutual funds
  • Bond mutual funds are funds which invest a majority of their assets in bonds of specific types of companies or institutions (5,565 taxable bond funds as of 8/12/16)
  • These funds generally have a specific objective, i.e. “corporate,” “government”, “municipals,” “growth,”, etc. which relates to the types of bonds the mutual fund invests in
  • In addition, most have a specific maturity objective as well, which relates to the average maturity of the bonds in the mutual fund’s portfolio
    • Their goal is to generally outperform their relative benchmarks
Types of Mutual Funds (continued)

• **Index funds** (1,185 as of 3/9/2017 – Morningstar)
  • Index funds are mutual funds designed to match the returns of a specific index or benchmark
  • Index funds can track many different benchmarks, including the S&P500 (Large-cap stocks), Russell 5000 (small-cap stocks), MSCI EAFE (international stocks), Barclay Aggregate (corporate bonds), DJ REIT (Real estate investment trusts), etc.
  • Index funds are tax efficient since they do little in buying and selling of securities
    • Their goal is to match the return of their relative benchmarks
Types of Mutual Funds (continued)

• Exchange traded funds (ETFs)
  • Portfolios of stocks similar to mutual funds which trade on organized exchanges (1,750 as of 3/9/2017 - Morningstar)
  • ETF’s trade like stocks, are purchased with all the transaction/custody costs, are priced throughout the day (rather than at day’s end like mutual funds), and can be sold short and purchased on margin
  • ETFs can be either in a unit investment trust (UIT) format or an open-end mutual fund structure. The UIT structure does not allow for reinvestment of dividends
Types of Mutual Funds (continued)

- Balanced funds
  - Mutual funds which purchases both stocks and bonds generally in a specific percentage or relationship, i.e. 60% stocks and 40% bonds.
  - Their benefit is that they perform the asset allocation, stock selection, and rebalancing decision for the investor in the fund.
    - Their goal is to exceed the return of their percentage-weighted relative benchmarks
Types of Mutual Funds (continued)

• Asset allocation funds
  • Mutual funds which rotate asset classes among stocks, bonds, and cash for the best return
  • Asset allocation funds invest the fund’s assets in the asset classes expected to perform the best over the coming period of time
    • Their goal is to exceed the return of their percentage-weighted relative benchmarks after costs and fees
Types of Mutual Funds (continued)

• Life-cycle (or target date) funds
  • Funds which change their allocation between stocks and bonds depending on investor age
  • As an investor ages, life cycle funds reduce their allocation to stocks and increase their allocation to bonds, more consistent with the goals and objectives of an older investor
  • These funds seek to perform the asset allocation decision normally done by the investor and to reduce transaction costs as well
    • Their goal is to exceed the return of their percentage-weighted relative benchmarks after costs and fees
Types of Mutual Funds (continued)

• Hedge funds
  • Hedge funds are less-regulated mutual funds which take much more risk than normal with the expectation of much higher returns
  • Generally they can take both long positions (where they buy assets) and short positions (where they short-sell assets, i.e., borrow assets and sell them). They hope to later buy back the assets at a lower price before they must return them to the borrower
  • Their goal is either to outperform their relative benchmarks or to have a consistently high total return
C. Understand the Major Classes of Mutual Fund Shares?

- Mutual funds are divided into classes of shares
  - These classes of shares vary depending on the loads and management fees paid
  - Loads are sales charges to compensate the sales force for selling the fund. Loads directly reduce the amount of money invested by the amount of the load
  - Generally, research has found that the performance of load funds and no-load funds is identical. When the sales charges are included, no-load funds significantly outperform load funds. (Matthew R. Morley, “Should You Carry a Load? A Comprehensive Analysis of Load and No-Load Mutual Fund Out-of-Sample Performance,” *Journal of Banking and Finance*, vol. 27, nu. 7 (2003), pp. 1245-71.)
Classes of Mutual Funds (continued)

• While there are differences in classes of shares among investment management companies which charge loads, they generally are:
  • Class A Shares: These shares commonly have a front-end or back-end load to compensate for the sales person’s commissions. Because of the front-end loads, they usually have lower management fees
  • Class B Shares: These shares commonly only have a back-end load that is paid only when the shares are sold. This load traditionally declines over time. Class B shares generally have higher expense ratios when compared to Class A shares
Classes of Mutual Funds (continued)

- Class C Shares: These shares generally have a lower front- and back-end load fees, but higher management fees
- Class R Shares: These shares are generally for retirement purposes. Check the loads and management fees which may be substantial
- No-Load Shares: These are shares sold without a commission or sales charge. Generally, these shares are distributed directly by the investment management company, instead of going through a sales channel. They may have higher management fees to compensate for the lack of a front- or back-end load
Classes of Mutual Funds (continued)

• Class Y Shares: These are shares with very high minimum investments, i.e., $500,000, but which have lower management fees and waived or limited load charges. These are generally for institutional investors.

• Class Z Shares: These are shares only available for employees of the fund management company.
D. Understand how to Calculate Mutual Fund Returns

• How do you make money with mutual funds?
  • Capital gains (i.e. appreciation market value)
    • Capital gains are the best type of earnings as capital gains at the share level are not taxed until you sell your mutual fund shares. You decide when to sell your shares and get taxed
  • Distributions (i.e., interest, dividends, realized capital gains, etc.)
    • This is a less attractive type of earnings. Even though you do not sell any mutual fund shares and most investors reinvest earnings, you are still liable to pay taxes on all distributions that your mutual fund makes during the year
Mutual Fund Returns (continued)

- Distributions are divided into 5 main types:
  - 1. Short-term capital gains
    - Capital gains where the Fund has owned the assets for less than 12 months.
    - These are taxed at your Federal and state “ordinary” or “Marginal Tax Rate”
  - 2. Long-term capital gains
    - Capital gains where the Fund has owned the assets for more than a year (366 days)
    - These are taxed at rate dependent on your taxable income (See Table 1)
Mutual Fund Returns (continued)

• 3. Qualified stock dividends
  • Payment of cash to the Fund by the companies owned where the company owned the shares for a specific length of time
  • These are taxed at a preferential rate depending on your taxable income

• 4. Ordinary (not-qualified) stock dividends
  • Payment of cash to the Fund by the companies who did not hold the stock for the required length of time.
  • Taxes on ordinary or non-qualified stock dividends are at your Federal and state Marginal Tax Rate
Mutual Fund Returns (continued)

- Table 1. Tax Rates on Capital Gains and Dividends

<table>
<thead>
<tr>
<th>Individual income tax rates for 2013</th>
<th>Taxable income*</th>
<th>Ordinary income</th>
<th>Capital gains and dividends</th>
<th>Medicare tax</th>
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<td></td>
<td>Single</td>
<td>Joint</td>
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<td>Earned income**</td>
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<tr>
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<td>$0+</td>
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<td>0%</td>
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</table>

*Based on estimated 2013 inflation adjustments. Amounts refer to taxable income except where noted.

**Combined rate includes 1.45% employer contribution.

Mutual Fund Returns (continued)

• 5. Bond interest and bond fund distributions
  • These are taxed at your federal and state Marginal Tax Rate
Mutual Fund Returns (continued)

• The key to after-tax returns is to understand the investment policy of the mutual fund (i.e., turnover and distributions), and to invest in funds which have the highest after-tax return
  • By looking at a fund’s turnover, you can get an idea about how often the mutual funds’ managers turn over the portfolio, generating:
    • Capital gains and losses
    • Federal and state taxes, and
    • Transactions costs
  • These are all at the Fund level. Remember that you are taxed on these each year, even when your Fund loses money and when you have not sold the Fund
Mutual Fund Returns (continued)

• How do you calculate fund returns?
  • Mutual fund returns include distributions of dividends, capital gains, and interest, and any NAV appreciation
  • Total return:
    
    \[(\text{ending NAV} - \text{beginning NAV}) + \text{distributions}\]

    beginning NAV

Make sure you adjust your beginning and ending NAV’s to take into account the cost of both front-end and back-end loads!
Mutual Fund Returns (continued)

• Calculating before-tax returns
  • With reinvestment of all distributions, total return includes the NAV share increase and the increased number of shares

Total return:

\[
(#ES \times EP) - (#BS \times BP) + \text{Distributions}
\]

\[
(#BS \times BP)
\]

#BS = beginning shares owned  BP= beginning price
#ES = ending shares owned    EP = ending price
Mutual Fund Returns (continued)

• Calculating after-tax returns
  
  • With reinvestment of all distributions, total return includes the NAV share increase and the increased number of shares. After-tax (AT) Total return is:
  
  \[
  (#ES \times EP) - (#BS \times BP) + 
  \]

  \[
  AT-SD + AT-LCG + AT-SCG + AT-BDI
  \]

  \[
  (#BS \times BP)
  \]

  ES = Ending Shares, EP = Ending Price, BS = beginning shares, BP = beginning price, AT-SD = Stock dividends * (1-tax on stock dividends), AT-LCG = Long-term cap gains * (1-tax on LT Cap Gains), AT-SCG = Short-term cap gains * (1-tax on ST Cap Gains), AT-BDI = Bond dividends/interest * (1-tax rate on interest)
E. Know How to Buy a Mutual Fund

• What are the steps to buying a mutual fund?
  • 1. Determine your investment objectives and goals and your key principles of successful investing
  • 2. Select your risk level, asset classes, asset allocation, and investment benchmarks
  • 3. Identify funds in each asset class that meet your objectives and benchmark subject to your investment principles
  • 4. Evaluate the funds and choose wisely based on your key investment principles
  • 5. Send money or purchase online
Step 1. Determine your Investment Objectives

• What is the final purpose of the funds you will be investing?
  • Know your personal goals and budget
  • Determine your risk tolerance and return requirements for each goal
  • Determine your investment constraints for each goal
  • Determine where you are now in your investment program
  • Determine which key principles are most important to this investment
Step 2: Choose Your Asset Classes

• What are the asset classes you want to follow?
  • Know your risk tolerance and asset allocation
    • Invest at a risk level you are comfortable with
  • Keep your performance broadly based
    • Choose a benchmark with many constituents
  • Choose the benchmark that most matches the performance you are seeking
    • Benchmark choice is very important
      • Tell me your risk level and your asset class benchmarks, and I will tell you what your portfolio should look like
Step 3: Identify Funds That Meet Your Objectives

- One of the easiest ways to identify funds is to use financial publications and services
  - You can access databases from which you can input your objectives and which will give you lists of possible funds. Examples include:
    - Morningstar Mutual Funds
    - Schwab One Source
    - Other fee-based databases
  - Determine the fund’s objective, asset class, and investment style
    - Identify funds that meet your criteria for performance, size, fees, management, etc.
Step 4: Evaluate the Funds

- How do you evaluate funds (some advice from a fund manager in a previous career)?
  - Always compare funds with the same objective
    - Compare them to a relevant index. Some funds are not willing to be compared to an index as it shows their poor performance.
  - Evaluate the fund’s long-term performance versus peers and the relevant index
  - Try to make sure they haven’t inflated returns by buying outside their asset class.
  - Look at returns in both up and down markets
  - If they have historically under-performed peers and the index, avoid both and buy an index fund
Evaluate the Funds (continued)

- Look to the managers
  - How long have they been managing the fund, and were they managing the fund during the periods of good performance?
    - Often good managers will leave when performance has been good to start their own firm, and others will come in later
- Size
  - How much has the fund grown or shrunk? If a fund is losing assets, it generally sells its liquid assets first
    - Often those left in a fund after liquidation are stuck with illiquid stocks that are harder to sell
Evaluate the Funds (continued)

• History
  • How long has the fund been around? Has it changed its style? How did it perform under previous names and managers?
    • Often fund companies will rename poorly performing funds and change investment objectives to mask poor performance

• Fees
  • Watch the fee structures. Sometimes funds will add additional fees, i.e. 12-b1 fees, or impose rear-end loads to help increase revenues to themselves
    • 12-b1 fees are paid by the shareholders and are just marketing fees. Avoid them
Evaluate the Funds (continued)

• Once you have selected a few funds, read each prospectus carefully
  • Information in the Prospectus
    • Fund information
      • Goals and investment strategy
      • Any limitations on investments that the fund may have, i.e., asset class constraints
      • Any tax considerations of importance to the investors
    • Services provided by the fund family
      • The redemption and investment process for buying and selling shares in the fund
    • Services provided to investors
Evaluate the Funds (continued)

• Information in the Prospectus
  • Manager information
    • The fund manager’s past experience and how long he/she has been managing the fund
  • Performance and fees
    • Performance over the past 10 years or since the fund has been in existence
    • Fund fees and expenses
    • The fund’s annual turnover ratio
    • Minimum account size
Evaluate the Funds (continued)

- **Printed Sources of Information**
  - *The Wall Street Journal*
  - *Morningstar Mutual Funds*
  - *Forbes or Business Week*
  - *Kiplinger’s Personal Finance*
  - *Smart Money or Consumer Reports*
  - *Wiesenberger Investment Companies Service*

- **Electronic Sources of Information**
  - [www.fool.com](http://www.fool.com)  Motley Fool
  - [www.morningstar.com](http://www.morningstar.com)  Morningstar
Step 5: Make the Purchase

• If you are planning to buy the fund through a financial broker, banker, or planner:
  • There is likely to be a load, or he will sell a class of share (i.e., R shares) which will rebate him a commission or charge an annual custody fee
    • Watch clearly for the class of shares sold
  • Research has shown, on average, that there is no statistical difference in performance between load and no-load mutual funds
  • You will get all the services of the mutual fund company
    • Ensure you can access your account through Quicken or other computer software
Make the Purchase (continued)

• If you plan to buy the fund directly from the mutual fund company:
  • Most of the time they are no-load funds and have no custody cost
  • You will get all the services of the mutual fund company, including an 800 number to call, internet access, and internet account information and servicing
    • Check to make sure you can access your account through Quicken or other computer software
    • Make sure your assets to be invested are more than the minimum account size
Make the Purchase (continued)

• If you plan to buy the fund through a “mutual fund supermarket” i.e., Fidelity Funds Network, Charles Schwab, or Jack White
  • You get all the benefits of the mutual fund company, plus they are Quicken compatible
    • You get access to a whole range of mutual fund companies (but not all of them)
      • Mutual fund companies rebate part of their management fees back each month to the “mutual fund supermarkets”
    • Minimum account balances vary
    • Transaction fees vary, but generally no custody fee
Questions

• Any questions on purchasing a mutual fund?
F. Understand the Costs of Mutual Funds

• What are the costs of mutual funds?
  • Explicit costs
    • Front-end Loads
      • Sales commissions charged to the investor when purchasing certain types of fund shares.
    • Back-end load funds
      • Commissions charged to the investor when selling certain types of shares. This may be on a sliding scale
  • No-load funds
    • Funds where there are no commission charged
Costs of Mutual Funds (continued)

• Fees and expenses
  • Management fees: Fee charged by the advisor to a fund generally on the basis of a percentage of average assets, i.e. 75 basis points or .75% a year
  • 12b-1 fees: Fees charged to cover the fund’s cost of advertising and marketing (why should you pay to market the funds to someone else?)
  • Total expense ratio: the total percentage of assets that are spent each year to manage the fund including management fee, overhead costs, and 12b-1 fees
Costs of Mutual Funds (continued)

- Explicit costs (continued)
  - Custody (or annual) fees
    - These are fees the brokerage house charges to hold the mutual funds or ETFs in your account.
    - May be a minimum amount for small accounts ($15 per year), a specific charge per holding (8 basis points per security), or a percentage of assets for large accounts (25 basis points on assets under management)
Costs of Mutual Funds (continued)

• Implicit costs
  • Taxes on Distributions:
    • Taxes must be taken into account to get the true return of your portfolio but which are not noted on your monthly reports
    • Bond dividends and interest
      • These are taxed at your marginal tax rate
    • Stock dividends
      • These are taxed at 15% or 0%
    • Short-term capital gains
      • These are taxed at your marginal tax rate
    • Long-term capital gains
      • These are taxed at 15% or 0%
Costs of Mutual Funds (continued)

• Hidden costs
  • Transactions costs
    • These are costs of the fund buying and selling securities, which are not included in other costs
      • Mutual funds which turn over the portfolio often, i.e. buy and sell a lot, will have higher transactions costs
    • A good proxy for this is the turnover ratio, a measure of trading activity during the period divided by the fund’s average net assets. A turnover ratio of 50% means half the fund was bought and sold during the period
      • Turnover costs money and incurs taxes
Costs of Mutual Funds (continued)

• Hidden Costs (at the account level)
  • Beyond the explicit and implicit costs, look for the following hidden costs:
    • Account Transfer Fees
      • Charges for moving assets either into our out of an existing account
    • Account maintenance fees
      • Fees for maintaining your account
    • Inactivity/Minimum balance fees
      • Fees because you did not have account activity during the period or because you failed to keep a minimum balance in your account
G. Understanding Plans and Strategies for Mutual Funds

- Following are a few ideas for your plans and strategies for mutual funds
  - Overall
    - What are acceptable investments? Mutual funds are good at doing what they do well, mitigating the risk of buying individual stocks and bonds by allowing the purchase of diversified portfolios of specific asset classes (IV.A-D.)
    - Mutual/Index/Exchange Traded Funds are great alternatives to actively managed mutual funds, and offer cost, tax, and other advantages
Plans and Strategies for Mutual Funds (continued)

• Plans and Strategies – General Investing
  • Due to the many different types of stocks and bond mutual funds, investors can invest at differing risk levels with mutual funds
  • Index funds/ETFs are great alternatives to actively managed mutual funds, and offer cost, tax, and other advantages
  • While risk of individual stocks and bonds can be high, buying mutual funds can reduce that risk considerably
Plans and Strategies for Mutual Funds (continued)

• Plans and Strategies – General Investing
  • If you are choosing to put in a little each week or month, choose no-load mutual/index funds due to no transaction fee.
  • If you are making one large purchase and holding it long-term, choose the ETF due to its slightly lower annual costs
  • Remember that most actively managed funds fail to beat their benchmarks after all costs and fees, and most index funds return close to their benchmarks.
Review of Objectives

- A. Do you understand the advantages and disadvantages of mutual funds?
- B. Do you understand the major types of mutual funds?
- C. Do you understand how to calculate mutual fund returns?
- D. Do you understand the process of how to buy a mutual fund?
- E. Do you understand the costs of investing in mutual funds?
Case Study #1

Data

• Bill and Sally invested in the following mutual funds in 2016. They are in the 25% federal and 7% state marginal tax brackets. (Remember in 2017 that qualified stock dividends and long-term capital gains are taxed Federally at 15% if your marginal tax rate is 25%). You can use Calculating After-tax Security Returns (LT33) to check your answers.

Calculations

a. Calculate the before tax and after-tax return on each of the funds in their portfolio for 2016 (from 12/31/15-12/31/16)

b. Calculate their overall portfolio before-tax and after-tax return. Note that the first three funds are all taxable, the municipal bond fund is federal tax-free for interest only, and the Treasury bond fund is state tax-free for interest only.

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>Ending NAV</th>
<th>Beginning NAV</th>
<th>Short-term Distributions</th>
<th>LT CGain &amp; Qual. Div.</th>
<th>Short-term Cap. Gain</th>
<th>Weight in Portfolio</th>
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<td>FIDELITY MAGELLAN FUND (FMAGX)</td>
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<td>89.43</td>
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</tr>
<tr>
<td>WFA MUNICIPAL BOND FUND-INV (SX)</td>
<td>10.34</td>
<td>10.45</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10%</td>
</tr>
<tr>
<td>VANGUARD SHRT TRM TREAS-INV (VFI)</td>
<td>10.64</td>
<td>10.65</td>
<td>0.094</td>
<td>0.002</td>
<td>0.030</td>
<td>10%</td>
</tr>
</tbody>
</table>

For the period beginning 20151231 and ending 20161231
Notes to Case Study #1

• Notes: ST = short-term distributions. For bond funds, these are interest and short-term capital gains, for stock funds they are non-qualified dividends, interest, and short-term capital gains. LTCG Distr. = Long-term capital gains distributions. Qual. Stock Distr. = qualified stock dividend distributions. % Portfolio is the beginning weight of the assets in your portfolio. Remember your overall portfolio return is your return of each asset times your beginning period weight.

• To calculate the after-tax return from each asset, determine the amount of taxes you will pay on each type of earning. Since you have not sold the assets, the only taxes you will pay will be those on the distributions you have received. Subtract out the taxes on distributions to give you the distributions you get to keep, and calculate your return:
  \[ \frac{\text{NAV}_{\text{Ending}} - \text{NAV}_{\text{Beginning}} + (\text{Distributions} \times (1 - \text{tax rate}))}{\text{NAV}_{\text{Beginning}}} \]

• Remember that the tax benefits on municipal and treasury bonds are only on the interest distributions. You still must pay all taxes on the capital gains distributions.
Federal Marginal Tax Rate 25.0%  
Federal Tax on Qualified Dividends 15.0%  
State marginal Tax Rate 7.0%  
Federal LT Capital Gains Rate: 15.0%  

<table>
<thead>
<tr>
<th>Stock Funds (all taxable):</th>
<th>Ending Net Asset Value (NAV)</th>
<th>Beginning Net Asset Value</th>
<th>Long-term Short-term Percent of Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fidelity 500 Index</td>
<td>91.36</td>
<td>89.43</td>
<td>0.546</td>
</tr>
<tr>
<td>Tax Rate (all taxable)</td>
<td>0.320</td>
<td>0.220</td>
<td>0.220</td>
</tr>
<tr>
<td>AT Return</td>
<td>1.93</td>
<td>0.371</td>
<td>1.653</td>
</tr>
<tr>
<td>50%</td>
<td>5.14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schwab Small Cap</td>
<td>28.10</td>
<td>24.10</td>
<td>0.391</td>
</tr>
<tr>
<td>Tax Rate (all taxable)</td>
<td>0.320</td>
<td>0.220</td>
<td>0.220</td>
</tr>
<tr>
<td>AT Return</td>
<td>4.00</td>
<td>0.266</td>
<td>0.594</td>
</tr>
<tr>
<td>10%</td>
<td>21.38%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bond Funds:</th>
<th>Corporate Bond Funds (all taxable):</th>
<th>Ending Net Asset Value (NAV)</th>
<th>Beginning Net Asset Value</th>
<th>Long-term Short-term Percent of Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanguard ST Bond</td>
<td>10.43</td>
<td>10.43</td>
<td>0.146</td>
<td></td>
</tr>
<tr>
<td>Tax Rate (all taxable)</td>
<td>0.320</td>
<td>0.220</td>
<td>0.320</td>
<td></td>
</tr>
<tr>
<td>AT Return</td>
<td>-</td>
<td>0.099</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td>1.42%</td>
<td>0.97%</td>
<td>0.030</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Muni Bond Funds (Federal Tax Free for Interest only (5)):</th>
<th>Ending Net Asset Value (NAV)</th>
<th>Beginning Net Asset Value</th>
<th>Long-term Short-term Percent of Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFA Muni Bond</td>
<td>10.34</td>
<td>10.45</td>
<td>-</td>
</tr>
<tr>
<td>Tax Rate (Fed tax free)</td>
<td>0.070</td>
<td>0.220</td>
<td>0.070</td>
</tr>
<tr>
<td>AT Return</td>
<td>(0.11)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10%</td>
<td>-1.05%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treasury Bond Funds (State Tax Free for Interest Only(5)):</th>
<th>Ending Net Asset Value (NAV)</th>
<th>Beginning Net Asset Value</th>
<th>Long-term Short-term Percent of Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanguard ST T- Bond</td>
<td>10.64</td>
<td>10.65</td>
<td>0.094</td>
</tr>
<tr>
<td>Tax Rate (state tax free)</td>
<td>0.250</td>
<td>0.220</td>
<td>0.250</td>
</tr>
<tr>
<td>AT Return</td>
<td>(0.01)</td>
<td>0.071</td>
<td>0.002</td>
</tr>
<tr>
<td>10%</td>
<td>1.09%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overall Portfolio Weight: 100.00%  
Overall Portfolio Before Tax: 4.99%  
Overall Portfolio After Tax: 4.39%  

Notes:
Case Study #2

Background

• Bill is concerned about turnover. He knows that for financial assets, the turnover rate is a measure of the amount of trading activity completed during a year; the turnover rate is expressed as a percentage of the average amount of total assets in the fund. A turnover rate of 10 percent means that 10 percent of the average amount of total assets in the fund were bought and sold during the year. He also knows that as a mutual fund investor must pay taxes on any distributions received during the year, including distributions the investor reinvests in additional shares. While high turnover may lead to higher returns, high turnover always leads to higher transactions costs as well as increased taxes if assets are held in taxable accounts.

• Bill’s marginal tax rate is 35 percent, and he lives in a state that does not have a state income taxes, so his short-term distributions will be taxed at 35 percent.
Case Study #2 Answers

Data

• The following information is for two of Bill’s bond mutual funds:

<table>
<thead>
<tr>
<th>Mutual funds</th>
<th>Fund A</th>
<th>Fund B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning NAV</td>
<td>$100.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>Short-term distrib.</td>
<td>$1.00</td>
<td>$0.90</td>
</tr>
<tr>
<td>Ending NAV</td>
<td>$109.00</td>
<td>$10.10</td>
</tr>
</tbody>
</table>

Calculations

• A. Calculate Bill’s before tax and after-tax returns on Fund A and Fund B (his marginal tax rate is 35%)

• B. What would have changed had the mutual funds been stock mutual funds and the distributions were qualified stock dividend distributions instead of bond distributions?
## Case Study #2

A. Bill’s before-tax and after-tax returns are:

<table>
<thead>
<tr>
<th>Fund</th>
<th>Fund B</th>
</tr>
</thead>
<tbody>
<tr>
<td>YTD nominal returns</td>
<td>10% (note 1) 10%</td>
</tr>
<tr>
<td>Estimated Turnover</td>
<td>10% 90%</td>
</tr>
<tr>
<td>Taxes on short-term distributions</td>
<td>35% 35%</td>
</tr>
<tr>
<td>Taxes paid (on short-term distributions)</td>
<td>$0.035 $0.315</td>
</tr>
<tr>
<td>After-tax return</td>
<td>9.65%(note 2) 6.85%</td>
</tr>
<tr>
<td>Loss from nominal return due to taxes</td>
<td>0.35% 3.15%</td>
</tr>
</tbody>
</table>
Case Study #2 Answers

- To calculate Bill’s before-tax return, the formula is
  \[
  \frac{\text{ending NAV} + \text{distributions} - \text{beginning NAV}}{\text{beginning NAV}}
  \]
  - Fund A: \(\frac{109 + 1 - 100}{100} = 10\) percent.
  - Fund B: \(\frac{10.10 + 0.90 - 10.00}{10.00} = 10\) percent.
- The formula for finding the after-tax return is:
  \[
  \frac{\text{ending NAV} + ((\text{distributions} - \text{taxes paid}) - \text{beginning NAV})}{\text{beginning NAV}}, \text{or:}
  \]
  - Fund A: \(\frac{109 + ((10 - 3.50) - 100)}{100} = 9.65\)%
    - Bill pays taxes of \$0.10 * 0.35 and keeps \$0.10 * (1 - 0.35)
  - Fund B: \(\frac{10.10 + ((0.90 - 0.315) - 10.00)}{10.00} = 6.85\)%
    - Bill pays taxes of \$0.90 * 0.35 and keeps \$0.90 * (1 - 0.35)
Case Study #2 Answers

• Regarding fund A, Bill pays 35% or $3.50 in taxes on a $10.00 distribution. Thus, his nominal return is 10%, after-tax return is 9.65%, and he loses 0.35% to taxes.

• Regarding fund B, Bill pays 35% or 31.5¢ in taxes on a ninety-cent distribution. Thus, his nominal return is 10% but his after-tax return is 6.85%, and he loses 3.15% to taxes.

• Although both funds have the same nominal return and the same tax rate, fund B’s return is 29% lower because of taxes related to higher turnover. Clearly, understanding taxes is very important. Know your tax-rate on each type of earnings.
Case Study #2 Answers

- If the distributions would have been stock dividend distributions instead of short-term distributions, instead of paying taxes at 35% which is Bill’s ordinary income rate, he would pay a preferential tax rate of only 15% for both Fund A and Fund B.