**Mutual Funds**

* Investment companies
  + Pool together funds from a group of investors in order to purchase a portfolio of assets, then they manage that portfolio
  + Advantages:
    - Diversification
    - Divisibility
    - Money management
      * Active vs. passive
    - Reduced transaction costs
  + Disadvantages:
    - Mutual funds often advertise that they outperformed an index
      * Indexes are not good comparisons for funds
    - Investment companies charge fees, which might outweigh their benefit
      * Most mutual funds underperform when we deduct their fees
      * Fees can vary significantly between funds even when they have the same investment strategy or are managed by the same company
* Caution: misleading reporting
  + Investment companies are required to disclose their holdings once a quarter using SEC form N-Q
    - Also required to disclose under certain other circumstances on SEC form N-CSR
    - This info is also disseminated directly to shareholders via annual reports/prospectuses/advertisements
  + We have no way of knowing whether they owned those shares for the full 3 months, 1 month, or 1 day
  + Window dressing: funds will often buy high-performing stocks shortly before the quarter end to make themselves look better
* Types of investment companies
  + Open-end funds (mutual funds)
    - Actively or passively managed
    - Issues an **unlimited number** of shares of investments in stocks or bonds
      * Shares are **bought and sold on demand at their NAV, only at the end of the day**
    - Not allowed to trade shares on an exchange
    - **Redeemable securities**: fund stands ready to buy back at NAV
      * NAV: Net Asset Value
      * The fund is required to do this every day except for holidays or when trading is restricted, so they issue and redeem shares daily
      * Usually maintains cash or liquid security reserves to fund withdrawals
    - Investment objective is to outperform a benchmark, and a portfolio manager trades to meet that objective
  + Closed-end funds
    - Traded on an exchange at market-determined prices, so prices are continuously changing
    - Fixed number of shares
    - Non-redeemable shares
* Unit Investment Trusts (UITs)
  + Type of investment company
  + Money pooled into a fixed portfolio, doesn’t trade so once you choose companies to invest in you stick with them
  + Designed to provide capital appreciation/ dividend income
  + Only exist for a certain period of time, then the shares are liquidated
    - Often 2 years or less
  + Investment relatively uniform across assets
    - Passively invested from start to finish
  + Tend to have higher fees than open and close ended funds
    - High purchase and sales fees
    - Operating fees tend to be low
* Exchange-Traded Funds
  + Mutual fund or unit investment trust whose shares are traded intraday on stock exchanges at market-determined prices
  + Creation
    - Sponsor chooses investment objective (index or active)
    - Publish info about holdings daily
    - Required to post marked-to-market NAV at end of each trading day
  + Key differences with mutual funds:
    - Shares are traded on an exchange through a broker-dealer
      * ETF trades like a common stock on a stock exchange
    - Price is continuously changing throughout the day
    - Mutual funds calculate NAV as of 4pm eastern, ETFs do not have a NAV in the same way that close end funds don’t
  + Differences with closed end funds:
    - Close end funds issue a fixed number of shares, ETFs can create or redeem shares continuously
    - ETFs managed passively and closed end funds managed actively
* How are mutual funds valued?
  + The value of a mutual fund = its Net Asset Value
    - NAV: a per share measure of the difference in the value of the fund’s assets and its liabilities
    - NAV = (MV of Assets – Liabilities) / Shares Outstanding
      * Assets: market value of portfolio
      * Liabilities: expenses and fees
* Example: Net Asset Value
  + An open-ended mutual fund has $200 million of assets under management. It has liabilities of $15 million and there are 10 million shares outstanding. What is the fund’s NAV?
* Mutual Fund Costs: Fees and Expenses
  + Paid directly by investors:
    - Front-end load
      * Commission or sales charges
    - Back-end load
      * Early exit fee
      * Contingent deferred sales charge
      * Because back-end loads phase out over time, they may be preferable to you as an investor, as long as your investment horizon is long enough to wait it out
  + Paid out of the fund’s assets:
    - Operating expenses
      * Pays costs of managing the fund
      * Typically 0.2-2%
      * Includes the management fee
    - 12b-1 fees
      * Marketing and distribution fees
* Fund Returns
  + Return = (NAV1 - NAV0 + Income and Cap Gain Distributions) / NAV0
    - Operating and 12b-1 fees are deducted when calculating NAV, so this measure is net of those expenses
    - Loads are paid directly by the investor, so they are not accounted for in this calculation
    - Fund return = gross return on portfolio – total expense ratio
      * Total expense ratio = operating expenses + 12b-1 fees
      * This calculation is still too high since it doesn’t account for the loads you pay
* Purchase price with front-end load
  + Loads are paid out of our total expenditure, rather than being added on to the price. This means we’ll actually pay:
    - Price = NAV / (1 – Load %)
      * NAV = Price x (1 – Load%)
  + Example: You’re considering purchasing a fund whose NAV at the close of trading is $32. If the fund has a front-end load of 2%, what will be the price you pay?
  + If you purchased a fund with a 3% front end load for $18, what was the NAV at the close of trading?
* Understanding Loads
  + Loads are different than other charges you may be familiar with, like tips or sales tax
    - Those are a % of the original price added on
    - The load is a % of the total paid
  + Example: consider the costs of a 7% sales tax vs. a 7% load on a $100 NAV fund:
    - Price using tax = 100\*1.07 = $107
      * Tax = 107-100 = $7
    - Price using load = 100 / (1-.07) = $107.53
      * Load = 107.53-100 = $7.53
* Other load issues – Phase out
  + Back-end loads tend to phase out over time
    - We might only pay a portion (given long enough) or nothing
  + These generally phase out uniformly, so we can calculate the remaining load as:
    - Back-end load owed = back end load % - years held
  + Note: if you hold the shares for the entire phase-out period (or longer), you don’t owe the back-end load
* Putting it together: loads vs. fees
  + When we combine the effects of loads and fees on our returns, our annual return on an investment in a mutual fund is
  + Notes:
    - We only pay the load once, so we only deduct it one time
      * Doesn’t matter if its front or back end
    - We pay fees every year so they reduce our return each time
* Using BA II Plus for r
  + Common question: given the required return and asked what return the mutual fund must be earning
  + Inputs
* Example: You are considering an investment in a fund with a 4% front-end load and a management fee of 1%. You can invest in a bank CD paying 5% interest. What return must the portfolio earn for you to be better off in the fund than the CD over a 3 year horizon? What about a 10 year horizon?
* Example: You are considering an investment in a fund with a 12b-1 fee of 2% per year and a management fee of 1%. You can instead invest in a CD paying 5% interest. What return must the portfolio earn for you to be better off in the long run?
* Example: considering an investment in a mutual fund advertising operating expenses of 2% per year. The fund also charges 12b-1 fees totaling 1% and has a back-end load of 5%, which phases out over 5 years. You plan to hold the mutual fund for 3 years and expect a 13% annual return. What is your annual return?