Syllabus for Capital Markets (FINC 950)
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Class Overview
Main Question the Capital Markets Class Will Answer

- This class will focus on answering the main question of
  - How should you invest?

- Another way to state this question is:
  - What is the best (optimal) investment portfolio for you to hold?

- There will be lot of sub-questions to this main question that we will answer as we go through the class
Perspective of the Capital Markets Class

- This class will answer the previous questions from two different perspectives
  - The main approach we will use is **quantitative analysis**, which uses mathematical and statistical techniques to determine portfolio strategies
  - In Module 3 we will use quantitative techniques to study what is called the passive approach to investing and indexing
  - Module 6 will use quantitative techniques to understand how financial markets work via arbitrage trading
  - The other approach we will examine is the traditional active management approach to **stock picking**
    - In Module 4 we will do this via **fundamental analysis** (discounted cash flow analysis) and the **multiples approach**, both of which you might remember from Fin I/ACF

- Please be aware that the quantitative approach uses a lot of regression analysis, which is the backbone of quantitative investing as it is practiced on Wall Street today
Class Overview

- Besides the lectures, we will have a series of cases and portfolio trading simulations to understand:
  
  1. Different financial securities you can invest in
  2. Different portfolio strategies (investment philosophies) you can employ and how to execute them

- We will predominately study bonds, stocks, mutual funds, exchange-traded funds (ETFs) and options
  
  - We will briefly discuss investing in commodities and real estate

- Note that this class is not just about making money via your investments, but equally important, about how to minimize potential investment loses
Outline of Class

- Module 1: Beginnings—Stocks, Bonds; Risk and Return Measures
- Module 2: Background on Trading, Using OTIS and Building Your Investment Portfolio
- Module 3: Advanced Portfolio Theory
- Module 4: Stock Picking
- Module 5: Factor Models
- Module 6: How Do Financial Markets Work?
- Module 7: Using Options in Your Portfolio
- Module 8: Behavioral Finance and Your Portfolio
Are you a CFA?

- If you are already a CFA, I strongly recommend that you do NOT take this class

  - This class covers material that is required knowledge for the CFA exams

    - Therefore, if you have a CFA you will find the material covered in this class to be very rudimentary and a review of material you already know

    - CFA’s that have taken the class in the past have all strongly suggested I discourage CFA holders from taking this class
Case Assignments

- The class has four group and three (or four for some) individual case assignments.

- You have been assigned a case group, see Canvas for your assignment.
  - Each group has five or six members with a minimum of two engineers and one business/economics major.

- For the cases’ due dates see Canvas’s home page or calendar.

- The cases will be graded on a scale of 12 points.
Case Participation Grades

- We will spend 30-90 minutes discussing each case in class and I will cold call students to answer the case questions.

- **You are not required to attend every class**, but if you are not going to be present, I need to know so I take you off the cold call list.
  - If a student is not present and I do not know in advance, they do not receive credit for the case if they are cold called.

- Poor or non-answers will reduce that student’s case score anywhere from 1 to 12 points.
  - If you are **not** cold called and volunteer an answer you will **not** be penalized for a poor answer.
Peer Evaluation of Group Members

- At the end of the quarter, group members have the opportunity to evaluate one another
  - You can only recommend a group member(s) for a grade reduction (not increase) from your group’s overall case grade
  - You may not recommend that all your group members receive a grade reduction
  - To submit a peer evaluation, simply email me, at the end of the quarter, the names of everyone in your group whom you want to deduct points for and how much (as a percentage)
Portfolio Simulations

- We will conduct five portfolio simulations during the class, these are **individual exercises**

- The portfolio simulations will use a trading platform developed at Wharton called OTIS
  
  - After classes start, see the announcement on Canvas on how to register for OTIS, it costs $19.95

- We will study how to use the OTIS trading platform in Module 2

- **You must complete your simulation trades on Fridays by 3 PM,** the day before we discuss the simulation in class
  
  - See Canvas for the simulations’ due dates
Portfolio Simulations, cont.

- The simulations are graded on a five-point scale, you will get:
  - Five points for the correct on time completion of the simulation
  - Three points if the simulation is not completed correctly or is late
  - Zero points if the simulation is not completed

- Individuals must come to class prepared to discuss the simulations
  - If you are unprepared you do not receive the full five-point score

- The simulations will not be graded based on the performance of the investments

- See Canvas’s home page or calendar for the simulations’ due dates
Assignments to Analyze Your Own Portfolio

- There will be three (for some four) individual cases and two portfolio simulations to give you the opportunity to
  1. Create a portfolio if you do not already have one (You will do this in the “Create Your Own Portfolio” case)
  2. Give you the opportunity to analyze your current portfolio if you have one or the one you will create if not

- As part of these exercises you need to provide me with the “tickers” for those US securities you are or will be investing in so that I can collect the necessary data for you (apologies, but the database does not include international securities)
  - You need to email me by no later than July 20 the “tickers” of the securities in your portfolio. The tickers need to be listed out in an Excel file, one ticker per row
    - Instructions on how to find your tickers are in the “Module 2: Using OTIS and Your Investment Portfolio” slides
Quizzes and Practice Problems

- There will be seven online Canvas quizzes (see Canvas for the due dates).

- Each quiz will cover material we went over in class since the previous quiz and is usually 3 – 5 straightforward questions and should take around 15 minutes of your time.

- The quizzes will be posted after the last class before they are due (so that I know what material to quiz you on).

- You can take each quiz as many times as you wish — ideally until you get all the answers correct.

- In addition to the quizzes there are practice problems for each Module. These practice problems and their answers are posted on Canvas and are not graded, they are to help you prepare for the exams.

  - It is strongly recommended you do some of these practice problems in preparation for the exams.
Exams

- We will have both a midterm and a final exam
  - The midterm will be a two-hour exam and can be taken anywhere during the scheduled exam class, the questions will be posted on Canvas
  - The final will be a three-hour exam and can be taken anywhere and anytime during a specified exam period, the questions will be posted on Canvas
- For both exams, you must submit your exam answers via file upload to Canvas via the Midterm or Final link under the “Assignments” tab
  - You may only submit one file and it must be an Excel file
- You can use your laptop and any electronic or paper material you wish during our exams
- See Canvas for the date of the midterm and the time period for the final exam
- Individuals are expected to abide by the Kellogg honor code and to complete the exam completely independent of any assistance
Class Participation

- The class participation grade is based on:
  
  - Asking questions during class
  
  - Participation in classroom discussions
  
  - Attendance. Attendance will be taken every class. Although you are not required to attend every class, regular attendance is expected. Missing more than one class is considered excessive. Students who do not attend class on a regular basis will receive a zero score for class participation which will cause their overall score to drop by a letter grade.

- You will never be penalized for participating in classroom discussions.
OPTIONAL Textbook and Other Class Material


  - See McGraw Hill’s website for different ways to buy the textbook

- A course pack with some of the required cases is available for purchase and is posted on Canvas under the “Study.Net” tab

  - All the other cases (and simulations) will be provided to you free via Canvas
Other Class Material, cont.

- There are additional optional readings for each Module that are posted under the “Files” “Additional Readings” tab on Canvas by Module or case

- You will find most of the necessary material for this class on Canvas, including:
  - Old exams
  - Practice problems
  - Lecture slides to print out with excel files to download
  - Case and portfolio simulation questions (and after the case is studied, the answers)
  - Answer keys for all the textbook problems for both the 10th and 11th editions
  - Excel files for relevant chapters of the textbook
Study Aids

- Every Module includes a “Study Aids” PowerPoint document on Canvas
  - Each Module’s “Study Aids” includes slides on the following:
    - **Key takeaways**: A quick review of the major content for a Module
    - **Study list**: List of what Module content to emphasize in your studying
    - **Key jargon**: List of the key terminology for a Module and their definitions (in order of appearance)
    - **Equations**: List of any important equations from a Module
    - **Excel worksheet(s)**: List of any worksheets for you to use for a Module
- The “Study Aids” are located on Canvas with the rest of a Module’s material in the file subdirectory “Module Slides, Study Aids, and Excel Files” or can be found with a Module’s material via the “Modules” link
- It is strongly recommended that you refer to these “Study Aids” when you are not familiar with a Module’s terminology and when preparing for the exams
Appendices

- All the Module slides we will study include appendices
  - The appendices include material that we do not have enough class time to discuss
  - Nevertheless, some of the appendices are required and their material can be on the quizzes and exams
    
    ➔ For those appendices that are required you are expected to study the material and be prepared to answer quiz and exam questions based on that material
Course Topics,
Recommended Readings,
Cases and Simulations
Module 1: Introduction to Financial Markets

- Realized returns vs. expected returns
- Risk
- Details on some financial instruments
  - Different types of bonds
  - Different types of stocks
- Interest rate risk (duration)
- Credit risk
Module 1 Case

- **Exchange-Traded Funds at Vanguard**
  
  Vanguard Group management, led by CEO John Brennan, was considering whether to launch exchange-traded funds (ETFs) in early 2000. ETFs, first created in the early 1990s, combined aspects of traditional mutual funds and closed-end funds. Because ETFs were exclusively index-tracking products, Vanguard, the largest index mutual fund company, had some potential expertise in managing ETFs. However, entering this market would present also unique challenges for Vanguard. Vanguard had a philosophy espousing low-turnover investing, while ETFs enabled short-term trading. The company would also need to develop a distribution network for ETFs. Finally, since Vanguard's mutual fund investors owned the company, management considered whether existing shareholders would benefit from an ETF product launch.

- **Learning objective:**
  
  To educate students about how exchange-traded funds (ETFs) work, their differences from other types of mutual funds, and the strategic issues for ETFs going forward.
Module 1 Portfolio Simulation

- **Make Money Quickly Portfolio**

  - In the first portfolio simulation students will create a portfolio that they hope will make the most money over just the quarter.

  - This will be a baseline portfolio that will be used as a performance benchmark for the other portfolios created during the quarter.
Module 2: Using OTIS and Your Investment Portfolio

- Primer on trading
  - Market orders
  - Limit orders

- Buy-side market participants and their holdings: Households, mutual funds, dealers, brokers, hedge funds and high frequency traders

- Trading on OTIS

- Conditions your initial investment portfolio must meet

- Reading:
  - “The Wolf Hunters of Wall Street”
Module 2 Case 1

- **Choosing Mutual Funds for Retirement Accounts (A)**
  - Focuses on an individual's decision to participate in her firm's retirement plan and how to invest her contributions. The (A) case focuses on which mutual funds the participant should invest in. Plan participants have a choice of 24 mutual funds with different investment strategies. Includes data from Morningstar on the composition and performance of the different funds and historical data. Uses Northwestern’s new 403(b) plan as its example.

- **Learning objective:**
  - To expose students to the concepts of Sharpe ratios and mutual fund/exchange-traded fund fees and their role in selecting investments.

- **Subjects covered:**
  - Investments; Mutual funds; Pension plans; Personal finance; Retirement savings; Mutual fund and exchange-trade fund fees; Sharpe ratios.
Module 2 Case 2

- **Creating Your Own Portfolio**

  - This case is for students who do not currently have an investment portfolio. The case instructs students in how to create a hypothetical portfolio that they will analyze during the quarter.

  - **Learning objective:**
    - To expose students to the basics of security selection.

  - **Subjects covered:**
    - Asset allocation; Asset management; Portfolio management.
Module 2 Portfolio Simulation

- **Your Initial (Current) Investment Portfolio**

  - In this trading simulation students will use their investment portfolios (including the portfolios created in the “Create Your Own Portfolio” case)

  - The simulation has students buy their initial (current) portfolio
Module 3: Advanced Modern Portfolio Theory

- Quick review of Fin 1 or Accelerated Corporate Finance (ACF) material on portfolio theory

- Portfolio theory for when you are considering investing in more than two assets
  - Minimum-variance frontier
  - Capital allocation line and the tangent portfolio
  - Selecting the optimal portfolio with a utility function

- Rebalancing a portfolio
Module 3 Case

- **Optimizing Your Portfolio**
  - This case has you take your current investment holdings and then optimize the portfolio to increase its return while minimizing its risk. For those students who do not have an investment portfolio, the will use the portfolio they create in the “Creating Your Own Portfolio”
  
- **Learning objective:**
  - To expose students to the principals of portfolio theory

- **Subjects covered:**
  - Asset allocation; Asset management; Portfolio management;

- **Case reading:**
  - Vanguard’s Diversification Strategy
Module 3 Portfolio Simulation

- Your Optimal Investment Portfolio

  - In this trading simulation students will use their initial (current) investment portfolios (including the portfolios created in the “Create Your Own Portfolio” case)

  - This simulation has students buy their optimized portfolio from the “Optimizing Your Portfolio” case
Module 4: Stock Picking

- The process of picking a stock
- Finding a stock to pick: stock screening
- Overview and strategic position of picked firm
- Define investment theses and forecast firm’s financials
- Conduct DCF and multiples calculations
- Value firm
- Selecting portfolio weights: the Kelly Criterion

**Reading:**
- “The Risk and Fall of Performance Investing”
- “Concentrated Investing”
Module 4 Case

- **Stock Picking**

  - In this case groups screen for a mispriced stock they want to invest. After they have picked a stock, they will value the stock via multiples and discount cash flow (DCF) analysis to determine its target price.

- **Learning objective:**

  - To expose students to the basic principle of stock picking.

- **Subjects covered:**

  - Stock picking; Asset allocation; Asset management.
Module 4 Simulation

- **Your Stock Pick**
  
  - In this portfolio simulation students will trade the stock they picked in the “Stock Picking” case or another stock of their choice.
Module 5: Factor Models

- Multifactor models
  - Fama-French three-factor model
  - Carhart four-factor model
  - Macroeconomic factor models
  - Three factor model for bonds

- Investing with factor models: Smart beta ETFs
  - What are they and the value added (if any) of investing in them

- Readings:
  - Characteristics, Covariances, and Average Returns
Module 5 Case

- **Smart Beta Exchange-Traded Funds and Factor Investing**
  - iShares by Blackrock is considering launching an innovative investment management product in the rapidly evolving ETF space, a multifactor ETF. iShares is the world market leader in the overall ETF market, as well as the newer smart beta ETF market. To understand the motivation for this product they reviewed recent academic literature on what are relevant factors that drive investment returns and factor investing. iShares needed to determine if this new multifactor ETF had value added over the ETFs they already sold.

  - **Learning objective:**
    - To examine the launching of an innovative factor-based smart beta ETF in the investment management industry.

  - **Subjects covered:**
    - Competitive strategy; Corporate strategy; Financial instruments; Investment management; Investments; Smart beta exchange-traded funds.
Module 6: How do Financial Markets Work?

- Relative pricing and arbitrage trading

**What is an asset pricing equation?**

- The CAPM’s asset pricing equation
- The arbitrage pricing theory

**Reading:**

- Luck versus Skill in the Cross-Section of Mutual Fund Returns
Module 6 Case

- **Your Portfolio’s Performance**
  - Students will examine the performance of their personal portfolio. The performance analysis will be conducted with a factor model. Students are to decompose the return and risk of their portfolio relative to individual factors and active management.

- **Learning objective:**
  - To study the details of portfolio performance measurement.

- **Subjects covered:**
  - Portfolio performance; Active management; Asset allocation; Stock picking ability.
Module 6 Simulation

- **Pairs Trading**
  
  - In this simulation exercise students enter into a pairs trade using the stock they selected in the previous “Your Stock Pick” simulation and another stock picked for this simulation.
  
  - Students need to find a stock to pairs trade with their original stock that they picked. The new company needs to be a comparable firm with their original stock pick. To form the pairs trade, the two stocks need to be mispriced relative to each other, one too expensive and the other too cheap. They can use any metric(s) they wish to determine that the stocks are (1) similar and (2) mispriced relative to each other.
Module 7: Using Options in Your Portfolio

- Introduction to options
- Review of option payoff diagrams from Fin I/ACF
- Option portfolio strategies
  - Protective puts
  - Covered calls
  - Collars
- Discussion of mutual funds that include options
Module 8: Behavioral Finance

- Two parts of the mind

- Simple heuristics investors use to their disadvantage

- Typical Behavioral biases that investors have
  - Overconfidence
  - Loss aversion
  - Framing
  - Mental accounting

- Reading:
  - Aspects of Investor Psychology
Module 9: Endings

- How taxes effect investment returns
- Managing foreign currency risk
- Life-cycle investing
- *Should you trade cryptocurrencies?*
- Social investing
- Activist investors
- Class Wrap-Up
  - The passive investment process
  - The active investment process
  - Putting the pieces together: How financial markets work
Module 9 Case

- **Your Final Portfolio**

  - Students conclude the course by creating a final portfolio of their choosing. The expectation is that students will use all of the information they learned in the class to create their final portfolio.

- **Learning objective:**

  - To integrate all of the teachings from the class

- **Subjects covered:**

  - Passive management; Active management; Asset allocation; Stock picking ability