Student-Managed Investments

FINA 472 (Proposed for Fall 2015)

Shingo Goto, Ph.D.
shingo.goto@moore.sc.edu
Office: 457D; 803.777.6644

1. Course Description

The course will provide students with hands-on experience in investment analysis as they manage a real portfolio. It will expose students to the decision-making in the design of a portfolio management process, especially with respect to asset allocation, security selection, and risk management.

2. Pre-requisites

(1) Requirements

Enrollment in this course requires a special permission from the instructor. Students must complete FNA469 before enrolling in this course. Familiarities with financial statement analysis (at the level of FINA470) or/and strong quantitative skills (especially for students with business analytics concentration) are also required.

(2) Selection of Students

The course is limited only to students with strong background and genuine interests in investments and scientific methods. Students will apply for admission to the course by submitting a resume, a list of elective courses taken, and potentially sitting for an interview, and the instructor will select the qualifying participants. Students will be recruited primarily from the Moore School of Business undergraduate programs. The number of students admitted to the course is set by
the instructor, but it will not exceed 30. Selection will be based on the student’s academic background, career goals, prior finance experiences, and overall motivation.

3. Course Overview

(1) Purpose

The objective of this course is to provide students with hands-on experience in investment research and portfolio management. To achieve this objective, students in this course will form an investment team that makes investment choices, subject to the instructor’s approval, in the management of funds in a Business Partnership Foundation (BPF) account. The team reports to the Finance and Investment Committee of the BPF.

The course will combine classroom pedagogy and out-of-class research, which will provide students with practical experience in an area that is of considerable interest to both students and their prospective employers.

(2) Hands-on Experience in Analytics

The course will manage the BPF fund very “actively” in a sense that the portfolio may deviate a lot from passive stock market indexes (e.g. S&P 500, Russell 3000, Wilshire 5000, MSCI World Equity Index,).

One of the main objectives of the active management is to see if students can find analytical insights and data to predict the firm’s future revenue growth and operational efficiency beyond what other investors have already incorporated into stock prices. Another important objective of the active management is to see if students can achieve superior reward-to-risk in the portfolio by actively managing the portfolio risk.
The course will also discuss how one would want to manage the portfolio with the arrival of new information and the uncertainty surrounding it. Students will examine various data sources to develop forecasting models, test their predictions through statistical analysis, simulations, and make decisions in response to new information.

Along the way, students will face real-time decision problems for which textbooks and lecture notes provide little guidance. These instances provide valuable opportunities for students to apply their analytical insights in making difficult team decisions under substantial uncertainty and time pressure.

To make the portfolio management process prudent and academically relevant, the course promotes scientific methods and evidence-based discussions in portfolio decision making. It strives to lessen the impact of subjective opinions and biases by emphasizing rules over judgments in portfolio decision making.

The course discussion will emphasize the soundness/sensibility of investment hypotheses, sample selection, and empirical methods, as well as on the consistency/robustness of out-of-sample empirical evidence. The course will seek to blend security valuation (return forecasting) analytics with portfolio analytics (e.g. risk attribution, portfolio optimization) under practical constraints (as set forth in the investment policy).

In sum, FINA472 will offer a practical experience in professional portfolio management while emphasizing the role of analytics in decision making. The rigorous and disciplined academic curriculum makes the course very different from a more casually-managed investment club.
3. Learning Outcomes

Upon successful completion of the course, students in this course, as a team, will be able to:

- Define investment objectives and constraints.
- Establish an investment policy, including targeted investment style, asset allocations, and appropriate benchmarks to evaluate performance.
  - Understand the existing investment policy statements.
  - Modify the investment policy statement, as necessary, to articulate the investment objectives and constraints more clearly.
- Select portfolio strategies using scientific methods. Point to clear and objective methods as the basis for the portfolio decisions, when being asked.
  - Source investment ideas from academic research and/or from the cutting-edge practice of investment institutions.
  - Turn the investment ideas into investment hypotheses that can be tested in data (under practical considerations).
  - Organize and filter data to test the investment hypotheses.
  - Find or develop appropriate empirical methods to test the hypotheses.
  - Test out-of-sample performance of hypothesized portfolio strategies with historical data and via simulations.
  - Check the robustness of the empirical results with different samples and with alternative specifications and constraints.
  - Analyze and discuss if a proposed strategy's expected excess return is commensurable to its marginal impacts on the portfolio risk.
  - Understand the virtue and pitfalls of back-testing. In particular, understand the danger of data mining/snooping in portfolio decisions.
• Construct the portfolio via return/risk optimization and heuristics.
  o Optimize portfolios to achieve the investment objective subject to constraints (as set forth in the investment policy).
  o Understand the virtue and pitfalls of optimization methods. Discuss how much optimization is optimal in the presence of parameter uncertainty and estimation errors.
  o Develop heuristic (yet systematic and non-ad-hoc) approaches to improve portfolio construction, as necessary.

• Measure and evaluate portfolio performance.
  o Conduct risk/return attribution analysis.
  o Evaluate how much is working and how much is random.
  o Measure individual securities'/strategies’ marginal and total risk contributions in the portfolio.
  o Measure the portfolio’s exposures to various systematic risk factors.
  o Measure the effects of turnover (transaction costs) on the portfolio.
  o Analyze and discuss risk budgets (as opposed to capital budgets) to see if students can improve the portfolio.

• Monitor the portfolio continuously and suggest improvements in the portfolio management process.

• Pass portfolio strategies and portfolio management processes on to their successors via verbal communication and documentation.

Notes: These are the learning objectives for the team, not for individual students. It is impractical to assume that each individual student can fulfill all of these learning outcomes within a semester. This course will encourage each student to develop expertise in some specialized areas of the portfolio management process based on her/his interest and background.
4. Course Materials and Suggested Readings

The course will utilize the computational resources in the finance lab (room 229). Available data resources, that are particularly relevant and useful for this course, include Bloomberg and Capital IQ.


Other useful references include, among others:


The course will also utilize online discussion forums to facilitate communication among the students and the instructor.

5. Course Format and Requirements

During the semester, students in this course will work on research projects in small groups. Each group will be responsible for documenting and presenting research outputs or/and developing software/database (e.g. spreadsheets) for the course.
Each group’s research project is determined at the beginning of the semester with the consultation of the instructor. Students also work on various ad hoc projects in response to new information and for making time-sensitive decisions.

The course meets regularly to stay focused on the teams’ objectives and to exchange ideas to enhance the overall productivity of the class. Students are also encouraged to share information/resources with the class and to initiate and participate in discussions online.

During the semester, each student group makes multiple presentations to the class to report the group’s progress and to receive feedback from other students and the instructor.

Near the end of the semester, the students will report their research findings and the portfolio performance in a formal presentation to the Finance and Investment Committee Members and the Executive Director of the BPF.

By the end of the semester, each student group will complete a research report. These reports will then be integrated into a formal End-of-Semester Report that is to be reviewed by the BPF Finance and Investment Committee.

6. Course Grading

(1) Specific Assignments and Evaluations

Course grading will be based upon the following components (assignments) weighted by the given percentages.

- Understanding portfolio management concepts and tools (32%):
  - Assessment Test (Theories and Concepts): 8%
  - Data analysis homework/project assignments: 8% each (24%)
    - Assignment #1: Measuring risk and returns; Regression analyses.
- Assignment #2: Optimal portfolio constructions; Portfolio risk decomposition; Risk-based asset allocation; Out-of-sample analysis.

- Assignment #3: Fund evaluation projects; Risk-contributions analysis; Performance evaluation with multivariate regressions.

- Group Research Projects (32%):
  Please see the Appendix (at the end of this file) for a description of this assignment.

  - Two presentations: 8% each (16%)
    - First presentation: Discuss motivation, objectives, sensibility of hypothesis, data and methodologies.
    - Second presentation: Discuss findings and their implications for the live portfolios. Discuss implementation issues.

  - Actual portfolio implementation (if the research conclusions suggest changes in the existing investment model and the live portfolio) and final research report: 16%

- Contribution to the Team’s Portfolio Management and Reporting Processes (36%):

  - Class attendance (essential) and active participation: 10%
    - Active participation means asking informed questions and providing informed comments to others’ work.
    - Periodic market commentaries (assigned).
    - Sharing information about market movements/developments that affect the live portfolio positions.

  - Rebalancing and monitoring of the live portfolio: 8%
    - Each student (group) will work as a model manager of one of existing portfolio strategies. Each student (group) is responsible for rebalancing, monitoring, and improving the existing portfolio strategy.

  - Final Board Presentation and the End-of-Semester Report: 18%
    - Active contribution to the preparation of presentation materials and rehearsals. (6%)
- Effective delivery of the presentation materials in front of BPF board members and other investment managers. (6%)
- Active contribution to the preparation of the End-of-the-Semester reporting document. (6%)

(2) Grading Scale

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<th>Range</th>
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<tr>
<td>A</td>
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<tr>
<td>B+</td>
<td>87 to 90</td>
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<tr>
<td>B</td>
<td>80 to 87</td>
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<tr>
<td>C+</td>
<td>77 to 80</td>
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<tr>
<td>C</td>
<td>70 to 77</td>
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<tr>
<td>D+</td>
<td>67 to 70</td>
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<tr>
<td>D</td>
<td>60 to 67</td>
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<td>F</td>
<td>less than 60</td>
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7. Sample Course Outline and Sample Students’ Report

The outline and requirements of the course will follow those of the FINA772 course that has been offered to graduate students. A sample of the End-of-Semester report from FINA772 (Spring 2014), which includes the investment policy, course outline, and students’ research outcomes, is available at: https://db.tt/tMR3UZ4d

8. Academic Integrity

It is the responsibility of every student at the University of South Carolina Columbia to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this Honor Code or who knowingly assists another to violate this Honor Code shall be subject to discipline. The Honor Code is attached below. For more information about the academic integrity issues, go to the following website: www.sc.edu/academicintegrity
Appendix: Group Research Projects

❖ Objective
   ➢ Acquiring information, knowledge, and skills that prove relevant and useful for the practice of investment management.
   ➢ Managing frustration and stress in the research process and group work. Coping with the time pressure.
   ➢ Conveying new information and insights to other students (giving lectures).
   ➢ Learning from other students. Accepting critical feedbacks from others.
   ➢ Audiences: Asking informed questions and providing constructive feedbacks to other students’ work.

❖ Group
   ➢ Each group consists of 2 or 3 students.
   ➢ Student may work individually if that is more convenient or productive for the student (though this is not recommended).

❖ Deliverable
   ➢ Two presentations and a final research report.
   ➢ Example: Here is an excellent report produced by a group of former students. https://db.tt/8P8JFt89

❖ Topics
   ➢ The instructor plans to give a few research questions from which students can choose.
   ➢ If students wish, they can work on a topic of your own interests. But they should not be too ambitious. Practically, students will have only a few weeks to work on the research project after getting familiar with the portfolio management processes. Please focus on a simple and practical topic/question.
   ➢ Here are a few examples of relevant research topics. (Students are welcome to choose from these topics if they are interested.)
Portfolio strategy: Portfolio strategies must be rule-based. You should focus on low turnover strategies (rebalancing quarterly or less).

- Asset allocation: Industry/sector allocation; Country allocation; Factor/style allocation; Index creation and/or enhancement, etc.
- Stock selection: Portfolio implementation of equity valuation models; Fundamental signals to identify under- or over-valued stocks; Industry-specific signals, etc.

Advanced portfolio management issues

- Multi-period portfolio allocation
- Implementation inefficiency (the effects of constraints, transaction costs, etc.)
- Performance attribution (return-based and holding-based)
- Portfolio risk analytics: Risk contributions and risk budgeting.

Portfolio management tools development

- Backtesting methods and software implementation
- Risk forecasting methods and software implementation
- Portfolio optimization methods and software implementation
- Performance attribution methods and software implementation

Former students (in FINA762 and FINA772) worked on the following topics (among others). Some of research outputs have been implemented in live portfolios.

- Practical Portfolio Management Issues
  - Does No-Short-Sale Constraint Really Limit Portfolio Performance?
  - Portfolio Optimization: Monte Carlo Simulation versus Modern Portfolio Theory
  - Portfolio Risk Estimation using Cross-Sectional Risk Models
  - Long-Horizon Portfolio Management with Bootstrap Simulations
  - Asset Allocation with Black-Litterman Model (e.g. Country ETF allocation and sector ETF allocation)
Portfolio Strategies

- Betting Against Beta and High Quality - Warren Buffet Style Portfolio
- Low Beta Portfolio Management Strategy in an International Context
- Momentum Effects (A few variants)
- High Dividend Portfolio Strategies
- SRY Market Timing Model Implementation
- Examining the Return Predictability of Accruals
- Active Management vs. Passive Management: Analysis of JP Morgan Active Mutual Funds

International Investments

- Optimal Allocation between Domestic and Foreign Assets
- Building International Diversification through MNCs and ADRs.
- Country ETFs vs. Global Sector ETFs: Which Offers More Diversification Benefits to Investors?
- GMVP and Risk Parity Portfolios: Choosing Individual Emerging Market ETFs Vs. The Emerging Markets ETF
- Frontier Markets vs. Emerging Markets
- GDP Growth’s Effects on International Markets
- Currency Selection Strategies (Carry Trades)
- Emerging Market Debt

Recent Developments in Investment Managements

- Socially Responsible Investing / Green Investing
- Active Share – Is Your Portfolio Manager in the Closet?
- Does Equity Mutual Fund Size Affect Alpha?
- What Should Investors Know about Mutual Fund Ratings
- The Market beneath the Market: Sovereign Wealth Funds
Other Topics

- Effects of Accounting Manipulation (Earnings Management, etc.)
- Determinants of Crude Oil Price Movements

Evaluation

Subjective:
High evaluation for original, insightful, rigorous, useful, and relevant (for investments) research.

- Other keywords include: sensible, creative, structural, logical, objective, critical, careful, consistent, and focused.

The instructor pays particular attention to the following elements:

- Research Question / Hypothesis / Prediction / Motivation
- Design of Methodology
- Information Gathering (e.g. Data Collection)
- Execution of Analysis
- Interpretations and Discussions of Results.
- Conclusions / Messages
- Scope and Depth

Please strive to conduct a simple hypothesis testing using data. I know that this is much more difficult than summarizing issues and concepts. I also know that some sensible ideas (hypotheses) are much more difficult to come by than others.

- The instructor tends to give high scores to projects that involve simple/sensible hypothesis testing. (Borrowing an idea from others is fine and recommended as long as you examine it by yourself using different sample.)

- The instructor tends to give low scores to those that merely summarize others’ arguments without verifying the claims by yourself with data.