

**FINQ 763: Quantitative Investment Strategies**  
**Spring 2020**  
**Lee Business School**  
**University of Nevada, Las Vegas**

**Lectures:** TBA  
**Office Hours:** TBA  
**Instructor:** Ankur Pareek

**Office:** BEH 525  
**Phone:** TBA  
**Email:** [ankur.pareek@unlv.edu](mailto:ankur.pareek@unlv.edu)

**Course Description:**

The course describes quantitative investment strategies used by active traders and provides a methodology to analyze them. In class and through case studies and a portfolio management project, students will learn to use real data to backtest or evaluate several of the most successful trading strategies used by active investment managers. A major takeaway of the course would be to provide students with the skills to read and analyze academic research articles for the search of profitable and implementable trading ideas. The course also covers issues related to performance measurement, transaction costs and liquidity risk, margin requirements, risk management, and portfolio construction.

**Course Material:**

The material for the course consist of two required textbooks, case studies, additional readings including research articles and lecture slides available for download on the course website (Canvas).

**Course Prerequisites:** Admission in MSQF program or approval by Director of MSQF program; FIN 710 and ECO 770

**Required Textbooks:**

[Lasse H. Pedersen, 2015, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press.](#)

[Ang, Andrew, 2014, Asset Management: A Systematic Approach to Factor Investing, Oxford University Press.](#)

**Case Studies:**

We will work on three case studies in this class. The cases are group projects. You can work in groups of 3 to 4 students. You can choose your group yourself. If you have trouble finding a group, let me know and I will assign you to a group. Word-processed write-ups (one per group) are due in class at the start of the case discussion. The three cases for which you are required to write a team report are:

**(1) Recorded Future: Searching the Web for Alpha**

<https://cb.hbsp.harvard.edu/cbmp/product/212057-PDF-ENG>

**Description:** Recorded Future was a software company that aimed to aggregate the information on the Internet in a way that offered new and valuable insights. Funded by Google and In-Q-Tel, the venture-capital wing of the Central Intelligence Agency, Recorded Future gave people tools to not only extract meaning from the web, but also to make predictions about future events ranging from terrorist attacks to corporate product releases. The case presents the investment decision of a portfolio manager, Andrew Fisher of LXE Capital, who is considering investing based on insights drawn from Recorded Future's software interface. The case asks students to grapple with a new source of investment data, to evaluate the reliability of back-tested portfolio strategies, and to ponder how best to utilize data for the purposes of generating "alpha" (positive risk-adjusted returns) in investing.

### **(2) Martingale Asset Management, L.P.**

<https://cb.hbsp.harvard.edu/cbmp/product/209047-PDF-ENG>

**Description:** In early July of 2008, William (Bill) Jacques, Chief Investment Officer at Martingale Asset Management, a quantitative value-oriented investment manager in Boston, Massachusetts, was busy preparing for an upcoming meeting with the group that made new product decisions within the firm. The objective of the meeting was to review the backtesting and real-time investment results of a new minimum-variance strategy within the framework of a 130/30 fund. The performance results were very encouraging, but Bill still wondered if they were a fluke of the data, a result of data mining rather than the reflection of a true market anomaly. He wanted to discuss several possible explanations of the phenomenon, and to decide whether Martingale should offer the strategy to its clients.

### **(3) Numeric Investors, LP**

<https://cb.hbsp.harvard.edu/cbmp/product/298012-PDF-ENG>

**Description:** Numeric Investors manages equity portfolios with the use of a momentum model and a value model. The momentum model is based on earnings surprise and analysts' revisions of their earnings estimates. The firm offers long-short as well as long-only strategies, and its approach involves high portfolio turnover. Numeric has experienced rapid growth in assets under management, which has resulted in higher transaction costs. The firm has already closed many of its products to further investment, and needs to decide where to go next. The case provides a rich setting within which to discuss value investing, momentum investing, the efficiency of analysts' earnings estimates, stock market efficiency, long-short investing, transaction costs, the relationship between assets under management and performance, performance fees, and the business strategies of investment management firms.

All students should come to class ready to discuss issues relevant to the assigned case. The cases are an integral part of the course design. For each case, I will provide you with a question sheet designed to help focus your analysis. The following are some general guidelines for case discussions and preparing case write-ups:

- Identify the objective and the main issues of the case.
- The write up should contain the answers and detailed analysis/steps corresponding to the questions outlined in the question sheet.
- The main body of your analysis should be self-explanatory and reasonably self-contained. That is, the reader should be able to replicate your results by tracing through the write-ups.
- State clearly the inputs to your analysis and the chosen methodology. If you feel that certain assumptions need to be made to justify a solution technique or a parameter choice, please make the assumption explicit.

### **Portfolio Management Project**

The students will work in groups of 3-4 members and use the stock returns and accounting data from CRSP, COMPUSTAT and other databases to backtest and implement refinement of one of the trading strategies discussed in class. Based on the results of the backtest, students will trade the strategy in real time through a virtual trading platform on Marketwatch website. Towards the end of the course, students will submit a brief writeup for the potential “Investors” discussing their strategy and results of their backtest and live performance. They will also present the findings to the class in a brief presentation.

### **Journal Articles**

In addition to the case studies and readings from the textbook, each week students will be assigned research articles from academic and practitioner journals to read and analyze. The articles will be discussed in class. Students are expected to read the articles in advance before the class and think carefully about the implementation of trading strategies or ideas presented in the research papers.

**Canvas:** This course requires an ongoing constant use of canvas. All announcements, assignments, changes, etcetera are posted there. I also use Canvas to contact you via email therefore it is important that you be sure that your correct email address is in your profile on Canvas.

In addition to the textbook and required readings, you are encouraged to read popular financial press articles during the term. The course will occasionally discuss relevant current events. Recommended sources include:

*Wall Street Journal* - the old standard

*Business Week* - good general business magazine

*Financial Times* - the best international business newspaper

*The Economist* - the best all around source of information

### **Grading:**

For the coverage of the exam, anything in the lectures, practice problem sets or the reading assignments is fair game. In case you miss the exam for a verifiable and acceptable reason, you should contact me at the earliest possible to schedule a make-up test.

Portfolio Management Project	30%
Case Studies	30%
Final Exam	40%

### **Class Participation**

Attendance in class is expected. Presence in class permits you to listen, ask questions of clarification and engage in discussions about the topic covered. In addition, you are responsible for knowing what goes on in class, which may include material not covered in the readings, modifications to the syllabus, and announcements concerning exams.

## **Student learning outcomes:**

1. Be able to implement investment strategies suggested by recent academic research.
2. Be able to test the effectiveness of various investment strategies using large databases and computer-based statistical software.
3. Think critically about investments problems and provide quantitative solutions.
4. Communicate effectively.

## Detailed Course Contents (Subject to revision!):

### **1. Introduction to Hedge Funds:**

- a. Hedge Fund Strategies
- b. Hedge Fund Objective and Fees
- c. Evidence on Hedge Fund Performance

#### Readings:

Chapter 1: Understanding Hedge Funds and Other Smart Monies, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press.

Chapter 17: Hedge Funds, Asset Management: A Systematic Approach to Factor Investing, Oxford University Press.

### **2. Fundamentals of Active Management**

- a. Performance Measurement
- b. Backtesting Trading Strategies
- c. Trading: Managing Transaction Costs and Market Liquidity Risk
- d. Financing a Strategy: Leverage, Margins and Haircuts
- e. Risk Management and Drawdown control
- f. Portfolio Construction and Optimization

#### Readings:

Chapter 2: Evaluating Trading Strategies: Performance Measures, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press.

Chapter 3: Finding and Backtesting Strategies, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press.

Chapter 4: Portfolio Construction and Risk Management, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press.

### **3. Theory of Factor Models**

Chapter 7 Factors, Asset Management: A Systematic Approach to Factor Investing, Oxford University Press.

Chapter 14 Factor Investing, Asset Management: A Systematic Approach to Factor Investing, Oxford University Press

#### **4. Quantitative Equity Strategies**

- a. Stock Return Anomalies
  - i. Momentum
  - ii. Long-run and Short-term Reversal
  - iii. Accruals Anomaly
  - iv. Post Earnings Announcement Drift
  - v. Low Risk Anomaly
  - vi. Quality Factor
  - vii. Other Anomalies

Chapter 9: Quantitative Equity Investing, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press

Chapter 10 Alpha (and the Low-Risk Anomaly), Asset Management: A Systematic Approach to Factor Investing, Oxford University Press.

#### **5. Finding Alpha and Behavioral Finance**

- a. Inefficiently Efficient Markets
- b. Limited Attention/ Bounded Rationality
- c. Behavioral Finance and Investor Biases
- d. Investor irrationality and Limited Attention as a precursor to Anomalies

#### **6. Macro Strategies: Managed Future Investing**

Chapter 12: Managed Futures: Trend Following Investing, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press

#### **7. Arbitrage Strategies**

- a. Convertible Bond Arbitrage
- b. Event-Driven Investing: Merger Arbitrage

Chapter 15: Convertible Bond Arbitrage, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press.

Chapter 16: Event-Driven Investment, Efficiently Inefficient: How Smart Money Invests and Market Prices Are Determined, Princeton University Press

## University Policies:

**Academic Misconduct**—Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the *Student Academic Misconduct Policy* (approved December 9, 2005) located at: <https://www.unlv.edu/studentconduct/student-conduct>.

**Classroom Conduct**—Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn or of instructors to teach. Use of electronic devices such as pagers, cellular phones, or recording devices, or potentially disruptive devices or activities, are permitted only with the prior explicit consent of the instructor. The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative drop.

**Copyright**—The University requires all members of the University Community to familiarize themselves with and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you, nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: <http://www.unlv.edu/provost/copyright>.

**Disability Resource Center (DRC)**—The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

**Final Examinations**—The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. The general schedule is typically available at the start of the semester, and the classroom locations are available about a month before the end of the semester. See the schedule at: <http://www.unlv.edu/registrar/calendars>.

**Incomplete Grades**—The grade of "I"—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of "F" will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the "I" grade.

**Library Resources**—Librarians are available to consult with students on research needs, including developing research topics, finding information, and evaluating sources. To make an appointment with a subject expert for this class, please visit the Libraries' Research Consultation website: <http://guides.library.unlv.edu/appointments/librarian>. You can also ask questions via chat and text message at <http://ask.library.unlv.edu/>.

**Rebelmail**—By policy, faculty and staff should email students' Rebelmail accounts only. Rebelmail is UNLV's official email system for students. As such, it is a primary way students receive official university communications such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. **Emailing within WebCampus is acceptable.**

**Missed Classwork**—Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor within the first 14 calendar days of the course for fall and spring courses (excepting modular courses), or within the first 7 calendar days of the course for summer and modular courses, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

In accordance with the UNLV Faculty Senate-approved policy regarding class time and assignments missed, students who represent UNLV in any official extracurricular activity shall also have the opportunity to make up assignments, provided that the student provides official written notification to the instructor no less than one week prior to the missed class(es).

The spirit and intent of the policy is to offer fair and equitable opportunities to all students, including those representing the university in extracurricular activities. Instructors should consider, for example, that in courses which offer a "drop one" option for the lowest assignment, quiz, or exam, assigning the student a grade of zero for an excused absence for extracurricular activity is both contrary to the intent of the Faculty Senate's policy, and an infringement on the student's right to complete all work and fairly earn her or his grade in the course.

This policy shall not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the university that could reasonably have been avoided. There should be a good faith effort by both faculty and student to come to a reasonable resolution. When disagreements regarding this policy do arise, they can be appealed to the department chair/unit director, college/school dean, and/or the Faculty Senate Academic Standards Committee.

For purposes of definition, extracurricular activities may include, but are not limited to: fine arts activities, competitive intercollegiate athletics, science and engineering competitions, liberal arts competitions, academic recruitment activities, and any other event or activity sanctioned by a college/school dean, and/or the Executive Vice President and Provost.

**Transparency in Learning and Teaching**—The University encourages students to use a transparency template to discuss with their instructors how assignments and course activities benefit student success: [https://www.unlv.edu/sites/default/files/page\\_files/27/TILT-Framework-Students.pdf](https://www.unlv.edu/sites/default/files/page_files/27/TILT-Framework-Students.pdf).

**Tutoring and Coaching**—The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit <http://www.unlv.edu/asc> or call 702-895-3177. The ASC building is located across from the Student

Services Complex (SSC). Academic success coaching is located on the second floor of SSC A (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TBE second floor.

**UNLV Writing Center**—One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's Rebel ID Card, a copy of the assignment (if <http://writingcenter.unlv.edu/>).