

# FRE7841 Hedge Fund Strategies

## 1 Course Description

### 1.1. Topic Coverage

This course will touch upon essential aspects of hedge funds required for young professionals interested in working in hedge funds or asset management more broadly from a quantitative perspective. The course will cover:

- Key financial concepts and methods required to understand hedge funds' role in financial markets and the strategies they pursue
- The strategies and assets traded at hedge funds in today's market—directional investing (equity and macro), fundamental and "stat-arb" equity long-short, event driven strategies (equities and credit), arbitrage and relative value strategies (rates, credit, volatility), etc.
- Key business operations for successful hedge funds, including the institutional infrastructure (“eco-system”) all hedge fund managers depend on (administrators, specialist law and accounting firms, prime brokers, data and analytics vendors, etc.); “ops” (trade and payments clearing and reconciliation), trading (execution) and risk management functions; marketing—capital raising—and investor relations
- Performance benchmarks, regulation, and methods and practices of large hedge fund allocators
- The history of the Hedge Fund industry
- Recent developments in its structural organization. Much of recent change in the sector has been due to steady advances in IT and AI. Hedge Funds with dominant positions (e.g., Citadel, Millennium, Renaissance Tech) have established a strong advantage in proprietary technology systems, IT talent and AI talent. This early advantage appears to allow these industry leaders to better absorb and more successfully integrate successive waves of innovation much like technology firms such as Amazon, Google, Meta and Microsoft.

The course will include the history of famous and infamous hedge funds – Soros, LTCM, Madoff, Renaissance, Citadel, DE Shaw, Millennium, Galleon, Amaranth, Archegos, etc. The “lore” of the role of speculators in financial markets, hedge funds' role in dramatic financial events, such as the EM crises of 1997 and 1998, the GFC of 2008-9, and even the more recent banking scare centered around Silicon Valley Bank will also figure into classroom discussion.

Who should take the course? Students with a fascination of how financial markets work and what it means to “beat” the market. The course will require a strong finance background already, meaning participants should have completed the MFE program Core Courses. There will be plenty of classroom discussion and students will be expected to read the financial press in the course of the term since discussion will draw on current market events and news stories for illustrations and context.

What should you expect from the course? A broad understanding of one of the most complex and sophisticated sectors in financial markets. The course will not be enough to turn you into a Hedge Fund Portfolio Manager in a semester, but if you want to get a job at a hedge fund this course will be enormously helpful for understanding job functions, opportunities, and understanding the issues and challenges potential future employers will be discussing in your interviews.

### 1.2. Instructor

**James Conklin** [jim.conklin1@gmail.com](mailto:jim.conklin1@gmail.com), [jc12861@nyu.edu](mailto:jc12861@nyu.edu), (413) 695-9514

## 2. Learning Objectives and Outcomes

The course seeks to:

- Teach students the Finance Theory required to conceptualize the objectives of hedge fund managers and the properties that make their returns attractive to end-investors
- Familiarize students with the nature of hedge fund strategies, portfolios and risk management and the resources required to execute them
- Show students how to use the tools of Quantitative Finance to implement hedge fund strategies: you will apply and combine a broad range financial principles and models spanning econometrics, optimization, portfolio theory, security valuation, etc., into concrete, practical trading and analytics models for hedge fund strategies
- Familiarize students with the legal and organizational structure of hedge funds and the institutional eco-system that exists to support them

## 3. Organization and Requirements

### 3.1. Format and Grading

Classes are in-person and will meet from 6p – 8:41p on Tuesdays for 7 weeks. There will be 2 homework assignments, 2 quizzes and a final project. Class participation will also contribute to grades. Questions by students for clarification, additional information or especially if you are a bit confused are highly valued – if you have a question your fellow classmates are likely to have it too – and count toward the participation grade.

Assignment	% of Final Grade
Homework	20%
Class Participation	20%
Quizzes	20%
Final Project	40%

Grading range:

Letter Grade	Percent of Available Points
A	94% - 100%
A-	90% - 93.9%
B+	85% - 89.9%
B	80% - 85%
B-	75% - 80%
C+	70% - 75%
C	60% - 70%
F	<60%

### 3.2. Prerequisites

- Matriculation into the MFE program or permission from the instructor
- FRE-GY 6083
- One of the following: FRE-GY 6233, FRE-GY 6331, FRE-GY 6351, FRE-GY 6411, FRE-GY 6711
- Beyond standard engineering math, proficiency in Excel, Python/Matlab/R etc. and data handling ability (sql or even orderly \*.csv files) is expected. It's not a programming course, but we'll be working with data and students' projects will require computation.

### 3.3. Text, Recommended Books and Materials

#### Required Readings:

There will be two course textbooks:

- Antti Illmanen (2011) Expected Returns, Wiley.
- Anson, Et Al. (2012), An Introduction to Core Topics in Alternative Investments (will be made available in PDF).

Assigned readings, available on-line or in PDF, are:

Brooks, Jordan (2017). “A Half Century of Macro Momentum,” AQR White Paper.

Grossman and Stiglitz (1980). “On the Impossibility of Informationally Efficient Markets,” *American Economic Review* 70(3): 393-408.

Grossman (1995). “Dynamic Asset Allocation and the Informational Efficiency of Markets,” *The Journal of Finance* 50(3): 773-787.

Hurst, B., Ooi, Y. H., and Pedersen, L. H. (2014), “A Century of Evidence on Trend-Following Investing.” AQR Capital Management White Paper.

Students should read Grossman and Stiglitz (1980) and Grossman (1995) prior to the first class. Subsequently the instructor will announce preparatory readings in class.

#### Recommended Readings:

*The Wall Street Journal*

*Financial Times*

The Scholarly Journal Archive ([www.jstor.org](http://www.jstor.org))

Social Science Research Network ([www.ssrn.com](http://www.ssrn.com))

Fox, Justin, The Myth of the Rational Market, Harper, 2011.

Grinold, Richard and Ronald Kahn, Active Portfolio Management, McGraw-Hill, 2000.

Lopez de Prado, Marcos, (2018). Advances in Financial Machine Learning. Wiley.

Lowenstein, Roger. When Genius Failed: the Rise and Fall of Long-Term Capital Management. Random House. 2001.

Moskowitz, T., Ooi, Y. H., and Pedersen, L. H. (2012). “Time Series Momentum.” *Journal of Financial Economics*, 104 (2): 228-250.

Bakrania, Doheny, Fader and Heinrichs, (2018). “Fundamental Trends and Dislocated Markets: An Integrated Approach to Global Macro Investing,” AQR White Paper.

Green and Zhao, (2022). “Forecasting earnings and returns: A review of recent advancements,” *The Journal of Finance and Data Science* 8: 120-137.

Long, et al (2022). “Macroeconomics matter: Leading economic indicators and the cross-section of global stock returns,” *Journal of Financial Markets* 61.

## 4 Tentative Schedule

The course topics are probably more suitable for a full semester. To cover the material in 7 weeks we will focus selectively “deep” on certain topics. Remaining topics will not be omitted entirely, but will be given “survey” treatment: the course will introduce important issues and concepts in the area, and review sources/materials for deeper study.

Lecture slides will be distributed within a few days after each lecture. There will be some guest lectures, taking a fraction of a given weeks’ class time. Speakers will be announced a week or two prior.

Subject matter for projects will be drawn from the “survey” topics that we cannot cover in depth. Students’ Final Project materials will be distributed to the class as a whole as supplemental materials to the lectures.

### **Week 1. The Point of a Hedge Fund: what is Alpha?**

1. Review: Efficient Markets, CAPM, Ross Multi-factor Pricing Model
2. Alpha definition
3. Are Markets Efficient? Grossman and Stiglitz (1979): No.
4. How Does Alpha Exist? Grossman (1993)
5. Weak-Weak Form Market Efficiency: Include Information Extraction Costs, Trading Capacity
6. The Kelly Criterion
7. Performance metrics: Sharpe Ratio, Sortino Ratio, Calmar, Jensen’s Alpha, skew.
8. Some famous managers, famous failures and famous successes

### **Week 2. Hedge Fund Strategies: Directional, Liquid Derivative Markets**

1. Global Macro
2. CTA – Trend Following
3. CTA – RV
  - a. Calendar spreads
  - b. Cross commodity spreads
  - c. Vol RV
4. Quant Macro
  - a. Carry & roll rates, Commodities, FX, volatility
  - b. Positioning, sentiment
  - c. Fundamental signals
    - i. Monetary conditions
    - ii. Now-casts, Econ surprise indices, Taylor Rule, Market priced cuts vs.
  - d. Machine Learning: CNNs, Regime Detection

### **Week 3. And Week 4. Hedge Fund Strategies in Global Equities**

5. Equity Long/Short – Discretionary: discretionary value, growth, earnings quality, management quality, sector specialties
6. Systematic Equity Market Strategies
  - a. Quant basics: data, computational requirements; back-tests; overfitting (no one believes a back-test)
  - b. Fundamental-based signals
    - i. Value
    - ii. Quality
    - iii. Earnings Momentum
  - c. Price-based signals
    - i. Price Momentum
    - ii. Mean-reversion / own, pairs, baskets
    - iii. Implied Volatility
  - d. Event-Driven
    - i. Merger-Arb

- ii. Index Rebal/Arb, ETF Arb
- iii. Carve outs; Spin-offs, Split-offs; IPOs; SPACs
- e. Alt-data
  - i. Short positioning
  - ii. Credit-card
  - iii. 10K – 10Q
  - iv. Industry-specific: web-traffic, foot-traffic, granular inventory reports, etc.
  - v. Purveyors: Accern, AlphaSense, Bloomberg, Dataminr, FactSet, Neudata, Quandl, Quiver Quantitative, Ravenpack, Refinitiv, Running Alpha, S&P Global (IHS Markit, Kensho, Platts, The Climate Service), Thinknum, Wolfe, Yewno|Edge, etc.
- f. Machine Learning: Ensemble methods to combine signals

#### **Week 4. Hedge Fund Strategies in Relative Value**

- 7. Fixed Income RV: Asset Swaps, Yield Curve; butterflies; Treasury basis; CDS-bond basis; on-the-run/off-the-run; etc.
- 8. Convertible Arb
- 9. Vol arb:
- 10. Credit Relative Value

#### **Week 5. Hedge Fund Strategies: The Rise of Multi-Strategy Platforms**

- 11. The Problem of Vol
- 12. The Infrastructure Excellence and Economies of Scale
- 13. The Problem of Netting of PM Performance comp
- 14. Dynamic Allocation Across the Opportunity Frontier
- 15. The Big Players

#### **Week 5. Risk Management, Funding, Liquidity, Capacity and Pricing**

- 1. Equities Risk
  - a. Cross-sectional, statistical models (Barra, Qontigo/Axioma)
  - b. Crowding
- 2. Macro Risk
  - a. Time-series oriented, scenario-based (RiskMetrics)
  - b. Dynamic correlations
  - c. Positioning /crowding
  - d. Risk-on, risk-off
- 3. Funding: balance sheet usage, cash and fund vol
- 4. Liquidity
- 5. Capacity
- 6. Fee Pricing

#### **Week 6. Organizationally, what is a Hedge Fund?**

- 1. Legal Structure: LP, GP
  - a. Fees
  - b. Key terms outside of fees: redemption terms, hold-backs/gates, GP rights to alter terms, non-voluntary redemptions
  - c. Alternatives to co-mingled Funds

- d. Regulations
  - i. Onshore-offshore: Cayman Islands, Channel Islands, Luxembourg, Dubai
  - ii. US: SEC, CFTC, US Treasury, Fed
  - iii. UK: FCA
  - iv. Singapore: MAS, CIS Code
- 2. Organizational structure
  - a. “Front Office”: CIO, PMs, Traders
  - b. Middle office / ops / CFO-COO
  - c. Risk
  - d. IT
  - e. Legal / Compliance
  - f. Investor Relations / Business Development
- 3. Due Dilligence
  - a. Track record
  - b. Institutional I: leaders, team, operational units (back/mid office, business dev, compliance, IR, IT, risk, trade execution), time in market, AUM, management structure of front office team, War for Talent,
  - c. Investment: alpha theses, edge, infrastructure to systematically re-produce thesis across regimes, dynamic market, behavior during draw-downs, pedigree of teams, depth of bench, etc.
  - d. Institutional II: legal compliance, balance sheet, GP Ownership, document review, etc.
- 4. Infrastructure: the Nexus of Third Party Providers
  - a. Prime brokers
  - b. Administrator
  - c. Legal
  - d. Audit
  - e. Trading Counterparties
  - f. Data and Analytics Providers

### **Week 7. Hedge Funds in Asset Allocation**

1. Who invests in Hedge Funds?– Family Offices, Funds of Funds, Pensions, Endowments, Insurance Companies, Foundations & Consultants
2. The Factor Structure of Hedge Fund Index Returns
3. Hedge Funds in Strategic Asset Allocation

### **Week 7. Project Presentations**