Hedge Fund Strategies

Prof. Andrea Frazzini

Course Description

The class describes some of the main strategies used by hedge funds and proprietary traders and provides a methodology to analyze them. In class and through exercises and projects (see below), the strategies are illustrated using real data and students learn to use “backtesting” to evaluate a strategy. The class also covers institutional issues related to liquidity, margin requirements, risk management, and performance measurement.

The class is highly quantitative. As a result of the advanced techniques used in state-of-the-art hedge funds, the class requires the students to work independently, analyze and manipulate real data, and use mathematical modeling.

Group Projects

The students must form groups of 4-5 members and analyze either (i) a hedge fund strategy or (ii) a hedge fund case study. Below you will find ideas for strategies or case studies, but the students are encouraged to come up with their own ideas. Each group must document its findings in a written report to be handed in on the last day of class.

The report is evaluated based on quality, not quantity. It should be a maximum of 5 pages of text, double spaced, 1 inch margins everywhere, 12 point Times New Roman, including references and everything else except tables and figures (each table and figure must be discussed in the text).

Each group analyzing a strategy should consider the economic rationale behind the strategy (what property of the market makes it inefficient in a way that you can exploit?), the relevant evidence from the academic literature (if any), the strategy’s past returns
using real data, estimate the associated transactions costs and possibly its use of capital (margin), and describe its success (or failure) using several performance measures.

Each group analyzing a case study must describe the involved parties and the events, analyze the underlying economic mechanisms at play, discuss the general lessons that can be learned, and are encouraged to try to estimate the returns and capital use of a strategy that corresponds to that used by the involved hedge fund(s) to verify anecdotal evidence.

**Grading**

The class evaluation will be based on the written group projects, class participation, and the exercises.

**Course Website**

http://people.stern.nyu.edu/afrazzin/teaching/ Hedge%20Fund%20Strategies.htm

**Teaching Assistant**

TBA
Outline

1 INTRODUCTION
   1.1 What is a hedge fund
   1.2 Historical Background
   1.3 Overview of Styles and Strategies
   1.4 Organization of Hedge Funds
   1.5 Hedge Fund Objectives and Fees
   1.6 Hedge Funds’ Role in the Economy

Readings:
   a. Lecture notes Section 1.

2 FUNDAMENTALS OF ACTIVE INVESTMENT
   2.1 Performance Measurement
   2.2 Backtesting a Strategy
   2.3 Trading: Managing Transaction Costs and Market Liquidity Risk
   2.4 Funding a Strategy: Leverage, Margins, and Haircuts
   2.5 Risk Management and Drawdown Control
   2.6 Portfolio Optimization
   2.7 Finding Alpha: The Economics of Profitable Strategies

Readings:
   a. Lecture notes Section 2.

Background reading, not required:


3 EQUITY STRATEGIES

3.1 Equity Long-Short

3.2 Equity Market Neutral

3.3 Dedicated Short Bias

Readings:


4 MACRO STRATEGIES

4.1 Global Macro

4.2 Managed Futures

4.3 Emerging Markets

Readings:


Background reading, not required:


5 ARBITRAGE STRATEGIES

5.1 Event Driven Investments

5.2 Convertible Bond Arbitrage
5.3 Fixed Income Arbitrage

Readings:

Background reading, not required:

6 DIVERSIFIED HEDGE FUND EXPOSURE
   6.1 Portfolio of Hedge Funds
   6.2 Fund of Funds
   6.3 Multi Strategy
   6.4 Hedge Fund Replication and Hedge Fund Risk Premia

CONCLUSION
Ideas For Projects on Trading Strategies (see also outline)

1. **Value investing:**
   You could study strategies based on
   1.a. A valuation ratio (B/M, P/E, etc.),
   1.b. net stock issues, or
   1.c. accruals.
   See e.g. the papers in class 2 and


2. **Momentum or reversals:**
   Study the profits of momentum or reversals in equity, industries, commodities, FX, or another market.


3. **Convertible bond arbitrage:**
   Get data on convertible bond prices and stock prices of the same companies and implement a backtest of the strategy. See also


4. **Carry trade:**
   Get data on interest rates and exchange rates for a number of countries and consider the return on the carry trade. Is the risk symmetric, i.e. equal size of upside and downside returns? See also


5. **Pairs trading:**
   Siamese twin stocks “should” follow each other, but sometimes diverge. What is a good trading strategy to exploit this. Look e.g. at Royal Dutch/ Shell and similar pairs

Also, some stocks tend to move closely together despite not being twin stocks. When they suddenly don’t, that can be a trading opportunity, see:


6. **Swap spread arbitrage:**

7. **Yield curve arbitrage:**
Make a strategy of risk free securities of various maturities. See Duarte, Longstaff, and Yu (2005) as above.

8. **Mortgage backed:**
It might be difficult to get data on mortgage backed securities, so you should only do this if someone in the group has access to such data. See


9. **Excess volatility:**
If traders trade “too much” and “push prices around excessively”, then how do you profit from this? Get inspiration from e.g.


10. **(Shorting) Index options:**
Consider index option strategies, such as selling at the money straddles. When is the strategy most profitable? See e.g.

11. **Earnings announcement drift:**
Is it profitable to buy companies with good earnings news and short those with bad news, after the news is released? See e.g.


12. **Distressed investing**
How do you identify opportunities among distressed bonds? How to evaluate default risk and recovery in case of default? Can bond holders be active investors? What is return to a diversified portfolio of distressed bonds (i.e. with no attempt of security selection) and does this capture most of the risk premium?

13. **Dedicated short bias**
How can you identify short-selling ideas? Are there ways of identifying frauds or does forensic accounting help? Is certain behavior of management a tell-tale sign of trouble?

14. **Emerging markets**
How do some of the investment strategies mentioned above work in emerging markets? What special considerations (e.g. costs, barriers, and risks) must be taken into account when investing in emerging markets? What are the special opportunities? How much of emerging market hedge fund returns can be explained by simply being long emerging market equity indices?

15. **Selecting hedge funds**
How do you select hedge funds? How should you analyze return data, and what other data is available (e.g. 13F, 13D, etc.), and how can this be used to cross-validate managers? How do you combine hedge funds into a portfolio? What is the best way to allocate capital across styles?

**Ideas for Projects on Hedge Fund Cases:**

1. **John A. Paulson and the subprime mortgage trade.**
How did Paulson and co. structure their trade? What was the downside risk and the upside potential? How did house prices evolve before and after the trade, and how do you think that Paulson and co. anticipated that house prices would stop rising? What might have been the rationale by the institutional investors that traded aggressively on the other side?

2. **Bernard Madoff, Ponzi scheme revealed 2009**

4. Hedge funds during the recent crisis in general.
   How did hedge funds do during the recent crisis? Which styles suffered the most, and which styles benefited and why? Did hedge funds provide diversification relative to equities? What type of risk management worked, and what were the main sources of trouble?

5. Amaranth Advisors, blow up 2006.
   Look at the press, e.g. WSJ 1/30/2007, and try to get data on energy (natural gas) futures and see what happened around the Amaranth blow up. How does Amaranth’s loss compare to the dollar loss for someone who had the entire open interest on NYMEX?

6. LTCM, 1998

   What happened and what do we learn about currency trading? Look at data on exchange rates and discuss the risk and return of a currency attack.

8. HBS Publishing, search for “hedge fund”:

   http://www.hbsp.harvard.edu/b02/en/home/index.jhtml?_requestid=102030

Additional Readings

The specific references used in class are mention above. Below you find additional material which is useful background reading for your general education, but not required.

Technical Books:

Non-Technical Books:


Entertaining episodes:

1. When Genius Failed by Roger Lowenstein. Account of LTCM failure, highly recommended bed-time reading for future quants.
2. Big bets gone bad by Phillipe Jorion. Description of Orange County fiasco. Fascinating description of the hapless college dropout who went from hero to zero.
5. Irrational exuberance by Robert Shiller

Advanced reading

1. Asset Pricing by John Cochrane

Others

1. American Psyco by Bret Easton Ellis, life on the Street