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Hedge Fund Strategies

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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

[TBA](#)

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.
- b. Fung and Hsieh (1999), "[A primer on hedge funds.](#)" *Journal of Empirical Finance*, vol. 6, pp. 309-331.
- c. Malkiel and Saha (2005), "[Hedge Funds: Risk and Return.](#)" *Financial Analysts Journal*, vol. 61, no. 6, 80-88.

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:

- a. Acharya, and Pedersen (2005), "[Asset Pricing with Liquidity Risk.](#)" *Journal of Financial Economics*, vol. 77, pp. 375-410. *Focus on 375-378, and 378-384.*
- b. Asness, Krail, and Liew (2001), "[Do Hedge Funds Hedge?.](#)" *Journal of Portfolio Management*, vol. 28, no. 1, pp 6-19.
- c. Black and Litterman (1992), "[Global Portfolio Optimization.](#)" *Financial Analysts Journal*, September/October.
- d. Brunnermeier and Pedersen (2005), "[Predatory Trading.](#)" *The Journal of Finance*, vol. 60, no. 4, pp. 1825-1863.
- e. Brunnermeier and Pedersen (2007), "[Market Liquidity and Funding Liquidity.](#)" *The Review of Financial Studies*, 22, 2201-2238. *Focus on introduction and Appendix A.*
- f. Garleanu and Pedersen (2009), "[Margin-Based Asset Pricing and Deviations from the Law of One Price.](#)"

- g. Garleanu and Pedersen (2008), [“Dynamic Trading with Predictable Returns and Transaction Costs.”](#)
- h. Pedersen (2009), [“When Everyone Runs for the Exit.”](#) The International Journal of Central Banking, forthcoming.
- i. Perold (1988), [“The Implementation Shortfall: Paper Versus Reality.”](#) Journal of Portfolio Management, Spring 1988, vol. 14, no. 3.
- j. Shleifer and Vishny (1997), [“The Limits of Arbitrage.”](#) The Journal of Finance, vol. 52, no. 1, pp. 35-55. *Focus on introduction, Section III, IV, and V.*

3 EQUITY STRATEGIES

- 3.1 Equity Long-Short
- 3.2 Equity Market Neutral
- 3.3 Dedicated Short Bias

Readings:

- a. De Bondt and Thaler (1985), [“Does the Stock Market Overreact?.”](#) vol. 49, no. 3, pp. 793-805. *Read only pages 793-800.*
- b. Jegadeesh and Titman (1993), [“Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency.”](#) The Journal of Finance, vol. 48, no.1, pp.65-91. *Read only pages 65-70.*
- c. Asness, Friedman, Krail, and Liew (2000), [“Style Timing: Value versus Growth.”](#) Journal of Portfolio Management, vol. 26, no. 3, pp 50-60.
- d. Lamont (2004), [“Going Down Fighting: Short Sellers vs. Firms”](#), Yale working paper.

4 MACRO STRATEGIES

- 4.1 Global Macro
- 4.2 Managed Futures
- 4.3 Emerging Markets

Readings:

- a. Soros (2010), [“Financial Markets.”](#) Lecture 2 of The Soros Lectures at the Central European University.
- b. Hurst, Ooi, and Pedersen (2010), “Understanding Managed Futures.”
- c. Porjarliev and Levich (2008), [“Do Professional Currency Managers Beat the Benchmark?”](#) Financial Analysts Journal, 64, 18-32.

Background reading, not required:

- d. Asness, Moskowitz, and Pedersen (2008), [“Value and Momentum Everywhere”](#)

5 ARBITRAGE STRATEGIES

- 5.1 Event Driven Investments
- 5.2 Convertible Bond Arbitrage

5.3 Fixed Income Arbitrage

Readings:

- a. “Long Term Capital Management, L.P.,” HBS Cases 9-200-007, 9-200-008, 9-200-009.
- b. Mitchell and Pulvino (2001), [“Characteristics of Risk and Return in Risk Arbitrage.”](#) The Journal of Finance, vol. 56; no. 6, pp. 2135-2176.
- c. Asness, Berger, and Palazzolo (2009), [“The Limits of Convertible Bond Arbitrage: Evidence from the Recent Crash”](#)
- d. Duarte, Longstaff, and Yu (2005), [“Risk and Return in Fixed Income Arbitrage: Nickels in Front of a Steamroller?”](#) Review of Financial Studies, 20, 769-811.

Background reading, not required:

- a. Duffie, Garleanu, and Pedersen (2002), [“Securities Lending, Shorting, and Pricing.”](#) Journal of Financial Economics, vol. 66, pp. 307-339.
- b. Mitchell, Pedersen, and Pulvino (2007), [“Slow Moving Capital.”](#) The American Economic Review, 97, 215-220.
- c. Mitchell, Pulvino, and Stafford (2002), [“Limited Arbitrage in Equity Markets.”](#) The Journal of Finance, vol. 57, pp. 551-584.

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

Fama and French (2006), [“Dissecting Anomalies,”](#) working paper.

2. Momentum or reversals:

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

See papers in class 2. There are many others, e.g. Chan, Jegadeesh, and Lakonishok (1996), [“Momentum Strategies,”](#) The Journal of Finance, vol. 51, no. 5., pp. 1681-1713.

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

Agarwal, Fung, Loon, and Naik, [“Risk and Return in Convertible Arbitrage: Evidence from the Convertible Bond Market,”](#) working paper.

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

Burnside, Eichenbaum, Kleshchelski, and Rebelo (2006), [“The Returns to Currency Speculation,”](#) working paper.

Brunnermeier, Nagel, and Pedersen (2008) [“Carry Trades and Currency Crashes,”](#) NBER Macroeconomics Annual, 23, 313-348.

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

de Jong, Rosenthal, and van Dijk (2009), “The Risk and Return of Arbitrage in Dual-Listed Companies,” *Review of Finance*, 13, 495-520, 2009. Paper and data on twin stocks here: <http://www.mathijsavandijk.com/dual-listed-companies>

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:

Gatev, Goetzmann, and Rouwenhorst (2006), “[Pairs Trading: Performance of a Relative-Value Arbitrage Rule](#),” *The Review of Financial Studies*, vol. 19, no. 3, pp. 797-827.

6. Swap spread arbitrage:

Profit from the difference between two virtually risk free rates, the Treasury rate and the swap rate. See Duarte, Longstaff, and Yu (2005), “[Risk and Return in Fixed Income Arbitrage: Nickels in Front of a Steamroller?](#)” *Review of Financial Studies*, 20, 769-811.

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

See Duarte, Longstaff, and Yu (2005) as above and Gabaix, Krishnamurthy, and Vigneron (2007). “[Limits of Arbitrage: Theory and Evidence from the Mortgage Backed Securities Market](#),” *Journal of Finance*, forthcoming.

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.

Greenwood (2006), “[Excess Comovement of Stock Returns: Evidence from Cross-Sectional Variation in Nikkei 225 Weights](#),” forthcoming *Review of Financial Studies*.

10. (Shorting) Index options:

Consider index option strategies, such as selling at the money straddles. When is the strategy most profitable? See e.g.

Amin, Coval, and Seyhun (2004), “[Demand for Portfolio Insurance and Index Option Prices](#),” *Journal of Business* 77, no. 4.

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.

Bernard and Thomas (1989), [“Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium?”](#) Journal of Accounting Research, vol. 27, pp. 1-36.

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

See book by Arvedlund (2009), “Too Good to Be True: The Rise and Fall of Bernie Madoff.”

3. Bear Stearns hedge fund collapse, 2007.

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

7. George Soros "breaking the Bank of England" 1992.

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:

1. Damodaran (2003), Investment Philosophies. Successful Strategies and the Investors Who Made Them Work," John Wiley & Sons, New Jersey.
2. Grinold and Kahn (1999), "Active Portfolio Management," McGraw-Hill, New York.
3. Litterman and the Quantitative Resources Group Goldman Sachs Asset Management (2003), "Modern Investment Management. An Equilibrium Approach," John Wiley & Sons, New Jersey.

Non-Technical Books:

1. Lewis (1990), “Liars Poker,” Penguin.
2. Lowenstein (2000), “The Rise and Fall of Long-Term Capital Management. When Genius Failed,” Random House, New York.
3. Schwager (1990), “Market Wizards,” First Perennial Library.

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 Phillippe Jorion. Description of Orange County fiasco. Fascinating description of the hapless college dropout who went from hero to zero.
3. Sold Short by Manuel P. Asensio. Vocal short-seller battles evil scamsters.
4. Capital ideas by Peter Bernstein. Short history of academic finance.
5. Irrational exuberance by Robert Shiller
6. Capital Ideas Evolving: A history of behavioral finance by Peter Bernstein. Also good bedtime reading.

Advanced reading

1. Asset Pricing by John Cochrane

Others

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