HEDGE FUNDS – Spring 2022 T4

COURSE SCHEDULE

1. (29-Mar)   Presentation + HF Overview
2. (01-Apr)   In search of Alpha
3. (05-Apr)   Investment Strategy - Technical Trading
4. (08-Apr) *   Investment Strategy - Fundamental Trading
5. (12-Apr)   Investment Strategy - Intraday strategies
6. (19-Apr) **   Investment Strategy - Statistical Arbitrage
7. (22-Apr) ***   Investment Strategy - Global Macro
8. (26-Apr)   Investment Strategy - Fixed Income Arbitrage
9. (29-May)   Investment Strategy - Fixed Income Arbitrage
10. (03-May)   Investment Strategy - Volatility Arbitrage
11. (06-May)   Investment Strategy - FX Arbitrage
12. (11-May)   Investment Strategy - Commodity Arbitrage

23-May ***   Final Exam

ASSESSMENT
Assignments: 30% (10% each)
Project: 20%
Final exam: 50%

> *   Assignment 1 - Portfolio back-testing _____ Due before class 4
> **   Assignment 2 - Equity systematic trading strategy _____ Due before class 6
> *** Assignment 3 - Macro analysis + trades _____ Due before class 7
> *** Project - Develop your own investment strategy _____ Due before Exam

Assignments and Project are to be done in groups of 4 students.
Students should use market data (from Bloomberg, Eikon or Data.xls) and Excel/ Matlab / Python / other software to back-test investment strategies.

RECOMMENDED READINGS

"Expected Returns: An Investor's Guide to Harvesting Market Rewards", Antti Ilmanen, 2011, John Wiley & Sons

Other readings: academic papers on investment strategies, economic news and market research notes.

You will be exposed to a large number of academic papers on investment strategies and market research notes, some available in class, others resulting from your own research. You should be able to quickly read through the abstracts / conclusions and select a few ones that fit your individual interests and / or that can be helpful for your own project.

Moodle password: HFT422.

ASSIGNMENTS

Assignment 1 – Portfolio back-testing   **Due before class 4**

Consider two different asset classes: equities and bonds.

For each of those asset classes select some futures (i.e. select at least 3 equity index futures and the same number of 10-year bond futures) and obtain daily closing prices for those futures for the last 19 years. You may use data provided in file Data.xlsb or download it from Bloomberg/Eikon.

1) For each asset class (equities and bonds), individually, design a trading strategy using the futures that you have selected based on the concept of trend following and/or mean reversion. Use simple moving averages and/or standard deviations to identify patterns and see how different period moving averages and number of standard deviations (parameters) generate different results. Select those parameters which generate the highest info Sharpe ratios consistently. To avoid overfitting use the same trading rules within each asset class.

2) Using the returns' time series calculated in 1), create a time series of returns for each asset class (equities and bonds) by equally weighting the returns of their respective individual futures.

3) Using the time series of returns for each asset class, create a portfolio mixing bonds and equities returns based on both fixed weights (e.g. 60/40) and risk parity.

4) Try to assess under which conditions each allocation method (i.e. fixed weights vs risk parity) performs better. To find patterns of over and underperformance between methods you can use indicators such as stocks returns, interest rates changes, yield curve spread, yield gap, realized vs implicit volatility, credit conditions, or any other at your choice. Be creative.

5) Create a regime-switching strategy where you change weighting schemes (fixed weights vs risk parity) according to the indicator(s) you have found to have most impact.

Your objective is to create an overall strategy with the highest possible Info Sharpe ratio for the entire period of your sample data, but also one that is relatively stable over time (try to maximize the percentage of positive days, positive months and to avoid large drawdowns).

Please hand in a 1-page report with the summary of your conclusions and strategy. Include a brief description of how it works plus a table with the summary (might be in annex) of its financial performance (return, volatility, info Sharpe ratio, % of positive days / months, etc). Please hand in also a copy of any excel or python files that you may have used for calculations.

Use size letter 11 and 1.15 line spacing. Respect the space constraint by synthetizing.

Assignment 2 – Equity systematic trading strategy   **Due before class 6**

The goal of this assignment is to develop an equity long only systematic trading strategy on the members of the S&P 500 (SPX Index) based on a mix of fundamental and/or technical factors. Use enough data to generate at least 10 years of returns from this trading strategy.

1) Using monthly data, create a ranking system to select the X companies that have higher Sharpe ratio for the past three years on a rolling monthly basis. The base trading strategy should be to invest (long only) on those stocks (using an equally weighted portfolio or any other weighting system) and doing so using monthly rebalancing.

2) Now try to add filter(s) that restricts the number of stocks that qualify for that ranking using one (or more) fundamental factor(s) like the earnings yield or the price-to-book ratio (for example only qualifies if the factor is above or below a certain threshold). Try to find the threshold (if any) that allow us to achieve the highest info Sharpe possible and stable returns across the sample period.

3) Hedge your long portfolio with a short position on the index (SPX) to create a market neutral strategy. Test different hedge ratios (% of SPX you short compared with the notional of the long portfolio).

Your objective is to create an overall strategy with the highest possible Info Sharpe ratio for the entire period of your sample data, but also one that is relatively stable over time (try to maximize the percentage of positive days, positive months and to avoid large drawdowns).

Please hand in a 1-page report with the performance and any potential pitfalls of the various back-tested strategies and your main conclusions (you may use annexes with graphical content).

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Assignment 3 – Macro Analysis + Trades   **Due before class 7**

Analyze the macroeconomic situation worldwide. Pay attention to economic news and/or macroeconomic research to be aware of any major events (past and future) that may affect the financial markets. Based on your assessment of the prevailing economic conditions, market

sentiment, monetary and economic policies, try to foresee what can be expected in terms of macroeconomic scenario in the close future.

Based on your macro scenario recommend a few trades. Your trades may be directional or relative value trades, in which case one trade may include more than one asset. Try to identify market fashions/trends that may continue/be reinforced and others that may fade or be reversed (without focusing on a specific trend only). Most importantly, try to identify trades that have a biased risk/return, i.e. trades that will gain more if you are right than loose if you are wrong, explaining why you believe so.

Please hand in a 1-page report with your macro analysis and a 1-page document for the recommended trades, that should be related your macro view.

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Project – Develop an Investment Strategy   **Due before the Final Exam**

The goal of the Final Project is to develop and back-test an investment strategy of your choice, using the asset(s), style(s) and trading period(s) that you want. The single objective of the project is to reach the best possible statistics on the back-test (Sharpe ratio, positive months, draw-downs, etc), under realistic assumptions (liquidity, trading hours, trading costs, etc).

You can generate ideas from the investment strategies discussed in class, from recommended books, from academic papers (given in class or obtained from internet databases, like ssrn), from bank research notes, financial blogs (like CSS Analytics, Quantpedia, The Whole Street, Quantum or Trading with Python) or any other (your imagination is good too). You can mix styles (technical, fundamental, quant, etc) and assets or asset classes, but you don't have to. Your strategy doesn't have to be very sophisticated or complex (in fact, if it is too complex it will probability be based on unrealistic assumptions or some sort of over-fitting).

Please hand in a small report (2 to 3 pages report – use annexes to add graphical materials) with the summary of its findings (strategy, statistics, idea source, bibliography) as well as a copy of any excel or Python files used (share the files as possible, through Moodle/Cloud platforms/WeTransfer, etc).

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