B9339 Quantitative Hedge Fund Strategies
Spring 2021

Course Description
In the last three decades or so, a number of investment strategies that capture (some source of) systematic risk factors have become popular. In some cases, the strategies have also become commonly available in the form of readily accessible investment vehicles (mutual funds, ETFs). Many of these strategies have been researched in great detail and have been applied, in different guises, to multiple assets classes with varying degrees of success. Broad categories of such strategies are “carry”, “momentum”, “risk parity”, “hedge fund replication”, “short volatility”, etc. Some of the strategies have become known collectively as ‘alternative beta’ or ‘alternative risk premia’ strategies. In this course, we use a hands-on approach to study some of these strategies: the premises behind them, the various forms in which they have been applied to different markets, the main risks. We examine the quantitative models through which the strategies have been implemented, and we look at real-world data that have been, or may be, used for their implementation. We focus on the context in which the strategies have been applied and examine the success, or lack thereof, with which they have been employed. When appropriate, we discuss the tradeoffs among the forms in which the strategies have become available for the wider public (efficiency, ease of access).

Course Outline (Tentative)
We study approximately 4-6 strategies. We study each strategy through a small number of select papers, from the academic or the professional literature. We also have, time and circumstances permitting, a number of distinguished professionals give “guest lectures” on aspects of the strategies, as practiced in leading institutions.

Recommended Background
Course discussions, to the greatest extent possible, are self-contained. Nevertheless, some familiarity with basic concepts in finance (e.g. fixed income and options), probability and statistics, and elementary optimization is useful for the easier absorption of the material.

Good review reading material for the course may be found in:
- J. C. Hull, Options, Futures, and Other Derivatives, Prentice Hall;
- David G. Luenberger, Investment Science, Oxford University Press.
For the homework assignments (see below), we assume:
  • proficiency with Excel, including its Solver (the built-in optimizer);
  • sufficient knowledge (or willingness to acquire such knowledge) of any software environment that allows for financial calculations and completion of the homework assignments (e.g. VBA, Python, R, Matlab).

**Grading**
The grade for the course is based on homework assignments, a final exam/project, and in-class participation. In-class participation counts for 10% of the final grade. The exact percentages for the homework assignments and the final exam/project are determined by the number of assignments and the scope of the final exam/project. The number of homework assignments is expected to be 2-4.