Empirical Asset Pricing II
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Schedule

Apr 8, 9, 10, 11, 12, 24, 25, 16.

Pre-requisites

- You should have taken a PhD level class in asset pricing that covers the theory of asset pricing models.
- You should also have taken a course in econometrics at the master level. We will do mostly OLS and sometimes GMM but nothing fancier. Nevertheless, the basics of regressions (all the associated assumptions, problems, solutions, etc.) should be hopefully second nature to you.
- You should also have some familiarity with programming. We will be working with data and, therefore, you should have the capability of downloading (large amounts) of data and analyze those. You can choose any programming language (SAS, Stata, Python, R, Matlab, etc). In my experience, working with a few languages makes life easier than sticking to just one.

Overview

This class is designed to give you an understanding of the basics of empirical asset pricing. This means that we will learn how to test asset pricing models and apply them mostly to stock markets. We will see which theories fare well and which ones do not. We will also learn about the cross-sectional patterns in stock returns. Lately, there is enhanced understanding amongst finance scholars of the dangers of data mining and we will review techniques to guard against too many empirical regularities. The flip side of the coin will be when we apply machine learning to discover even more patterns in the data (the class will not deal with techniques of machine learning; only their applications). Towards the end we will move away from stocks to look at the cross-section of bonds and options and explore interlinkages between these markets. Finally, we will explore the performance of various kinds of funds. Concretely, we will cover the following topics:
1. Asset pricing tests
2. Cross-section of stock returns
3. GMM/SDF based tests, choosing factors
4. Aggregate predictability, test of conditional models
5. Consumption-based models
6. Multiple hypothesis testing
7. Machine learning
8. Stocks and corporate bonds
9. Stocks and options
10. Performance of mutual funds, institutional funds, hedge funds

Organization

Lectures will be organized around relevant papers. All these papers (and more) can be accessed via the Dropbox link
https://www.dropbox.com/sh/992erxliqshfnjj/AABP_MuRl_65ZNSaTf76waIfa?dl=0.
Obviously, we will not have enough time to cover all (or even 10% of) the >1,000 papers. I will choose the papers that are the most relevant.

The class notes will be available at a DropBox link to be provided later.

Assessment

There will be one project counting for 80% each. The remaining 20% will be based on writing a referee report. Details on the project are on the next page.

Books

The following books can serve as a background reference (although our class will rely mostly on papers):
1. John Y. Campbell, Andrew W. Lo, and Craig MacKinlay, 1997, *The Econometrics of Financial Markets*, Princeton University Press.
2. John Cochrane, 2005, *Asset Pricing*, Princeton University Press.
3. Turan G. Bali, Robert F. Engle, and Scott Murray, 2016, *Empirical Asset Pricing: The Cross Section of Stock Returns*, Wiley.
4. Wayne Ferson, 2019, *Empirical Asset Pricing: Models and Methods*, MIT Press.

Please read (a) chapters 1 through 6 of Bali, Engle, and Murray, and (b) chapters 2 and 4 of Campbell, Lo, and MacKinlay before first class!

Project : Construction of Factors

We will create a new VOL factor. The definition will mostly follow Ken French "Var is estimated using 60 days (minimum 20) of lagged returns." Please follow the standard practice of creating factors from 2×3 double sorts using breakpoints from NYSE stocks. Different from other FF factors, the VOL factor will be formed monthly. Add this factor to the FF3 model – call it FF3V model. Compare its performance with that of FF5 model. To answer this question:

1) You will need to download data from WRDS. These data will be mostly from CRSP (you may or may not need Compustat and merged CRSP-Compustat database). There are lots of details about merging data that you will need to learn about. The factors should be constructed over the sample period 1963 to 2023.
2) Create the new VOL factor.
3) Select test portfolios. Choose a few and be ready to justify your choices.
4) Compare the two models: FF3V and FF5. Decide what is the comparison metric.
5) If FF3V model does better than FF5, explore why this might be the case. If it is the other way around, explore the reasons for that instead.

There is nothing magical about empirical choices to construct factors. If you wish, you could entertain the following modifications:
- Use 3×3 independent double sorts (instead of 2×3 sorts)
- The three portfolios could be based on 25th and 75th percentiles (instead of 30th and 70th percentiles).
- You may not use NYSE breakpoints.
- Any other changes that you wish to make.

If you do use (any of) these modifications, be ready to justify.

Please be as detailed as possible in the project "report" – what you did, how you did it, what the results, and the interpretation of the results. Be ready also to show the "running of the code" to me in person. I may ask you on the fly to change part of the specifications. You are free to use (even encouraged to use) code available over the internet. However, it is your responsibility to understand the workings of the code so that you can make changes to it to suit your purpose.