Syllabus for BA539D: Empirical Methods in Finance, Spring 2013

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Office Hours: Wednesday from 9:00-12:00.
Course time: Wednesday 1:30-4:30.
Location: Rehn 115 (Finance Conference Room).


Prerequisites: Enrollment in Finance PhD program and/or permission of instructor. Some exposure to statistics and econometrics is necessary for success in the course. See technical requirements (below) for more prerequisites.

Course Description and Objectives: The purpose of this course is for students to learn how to conduct empirical research in finance and related disciplines. The focus will be on quantitative methods, although alternative research approaches will also be considered. Research methods in finance will be examined from the perspective of the scientific method and compared to methodological approaches from other disciplines. Unlike most other doctoral seminars, this course will primarily be composed of hands-on research projects, rather than reviewing the literature in the field.

Technical Requirements: The course requires sophisticated data manipulation and statistical analysis. At a minimum, students must have access to, and basic knowledge of, Microsoft Excel and SAS. Students must have access to a reliable high-speed internet connection and computers with sufficient power to run the analysis of large datasets in SAS. Any student who wishes to use an alternative software platform, such as STATA instead of SAS, must have prior approval from the instructor. Such approval will be given only on demonstration of sufficient ability with the alternative software. Relying solely on SPSS, Matlab, or Eviews is insufficient for the needs of this course.

Guidelines on Collaboration and Exchange of SAS code and data: You are not to share directly or indirectly with anyone else data or computer code (including, but not limited to raw data, processed data files, SAS code or Excel code), except as allowed for in the following. We encourage you to share code snippets by posting on the course Blackboard discussion board. This is a good way for you and others to learn new techniques or thoughtful approaches. We will count constructive contributions to the course website as part of your overall class participation. A code snippet is a piece of code that accomplishes a single task. It might contain a number of steps, but all steps are relevant to the targeted task. A SAS program is more than a code snippet and we generally prefer not to have complete programs posted.
you would like to share SAS code, we certainly encourage it. If you are uncertain about whether it fits under this policy, you can go ahead and post it without fear of penalty, understanding that we might ask you to revise your post. Otherwise, we are happy for you to ask us for guidance.

You are still welcome to discuss the projects outside class and exchange ideas. However, the exchange of actual SAS code or data should be restricted, as described here.

In addition, you are to e-mail all of your code used in a project to the instructor on the day that the project is due. Your code should cite any and all contributions that you sourced from the course Blackboard discussion board. Cites should be in the form of a comment in SAS code, a note in an Excel file, and/or a footnote in the write-up, as appropriate to the context of the citation. For example, if you use a code snippet from a post on Blackboard, then the code should be preceded by a simple comment in your code as to the original author of the code and the date of the code snippet post. As another example, if you conduct a hypothesis test, specify a regression model, or construct a sample as substantially suggested by a Blackboard post, you should cite this in your write-up in a footnote.

Presentations and write-ups are to be your own work and not the work of others in whole or in part. All write-ups will be submitted through D2L.

**Academic Dishonesty:** Cheating will not be tolerated—we will refer any case of suspected cheating to the dean and recommend an F in the class as the minimum penalty.

**Class Disruption or Cancellation:** In the event that class is cancelled, and/or SIU campus is closed, students should proceed as given by SIU policies and procedures. Instructions for this class will be given via the course website, and/or email. If internet access is unavailable then students are expected to continue to work on the assigned projects as indicated in the syllabus. Upon the resumption of class, students will be expected to have made progress on all material required up to that point.

**Emergency Procedures:** Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, on the BERT’s website at [www.bert.siu.edu](http://www.bert.siu.edu), the Department of Public Safety’s website [www.dps.siu.edu](http://www.dps.siu.edu) (disaster drop down) and in the Emergency Response Guidelines pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. **It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency.** The Building Emergency
Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

**Grading** (subject to change at the discretion of the instructor):

- Class Participation: 10%
- Mid-term Exam: 20%
- Final Exam: 20%
- Projects and Presentations: 50%

This first section of the course will be structured around a series of projects. These projects are designed to familiarize you with increasingly complex research methods using the most useful datasets for finance research.

The write-ups and presentations should include the following:

1. **Introduction**, context, and research questions.
2. **Very brief literature review** focusing on the papers whose methods and sample are the most similar to this project. I will provide 1 reference. You should then find at least 1 paper published on a top finance or economics journal and one working paper. Limit the literature to at most 5 papers. PDFs of your references must be uploaded to the course website.
3. **Two or three precisely-specifed and testable hypotheses.** Express these both qualitatively (in words) and quantitatively (by formula).
4. A description of the database to be used, the data collection methods, and alternative data sources. Carefully describe and provide statistics on the variables included, the number of observations at all stages of sample construction, sample biases, and data errors. Include detailed descriptive statistics of the final sample.
5. **Empirical Analysis:** focus on the simplest possible econometric tests of your hypothesis (t-tests for differences in means are usually sufficient). Include additional analysis of the robustness based on alternative variables and sample construction methods rather than more advanced econometric techniques.
6. Clearly indicate if the hypotheses are rejected or not rejected by the analysis. Interpret the results with regard to the research questions that were first proposed. Compare these results to other studies.
7. **Discuss the limits, shortcomings, and potential problems with the analysis.**
8. Propose improvements to the analysis and paths for further research.
9. Any SAS code, online resources, or other documentation of analysis should be submitted as an appendix to each final report.

For most projects there will be 2 presentations.

**Introductory Presentation:** The presentation will describe items 1-3 given above, as well as proposals and initial experiences for item (4).

**Empirical Analysis Presentations:** This presentation will describe the final results for item (4), as well as items 5 and 6.
**Draft Reports:** For each project, all students should submit a draft report for items 1-4. The draft report will be submitted by the beginning of class on the day of the introductory presentation. These reports should be about 4-6 pages and will cover the same material as the introductory presentation.

**Full reports:** Each student will complete and submit a final 10-20 page (5-10 pages of text and 5-10 pages of tables and figures) full report (items 1-9) on the day of the second presentation.

Some projects will be done in one week, with the two presentations and reports combined.

**Class Participation:** Every student must participate in every class meeting to discuss the presenters’ work, your own experiences (for all items), and the related literature. Non-presenters should take the lead in discussing items 7 and 8 given above.

**Exams:** The exams will be similar in format and difficulty to what one could expect on a Ph.D. comprehensive exam. You will be given one or more potential research projects similar to the ones we have done in the course. The mid-term will be take-home and the final exam will be in-class. The exams will require you to propose the hypotheses, data sources, and basic methodology for a research study. Your response should be similar to one of the draft reports from the class.

**Project Descriptions**

1. **CRSP Project**
   Characterize the CRSP monthly and daily databases by creating tables of summary statistics. Items that must be included in the analysis are the distributions of:
   - Number of stocks
   - Capitalizations
   - Volume
   - Length of return record
   - Surviving and non-surviving firms
   - Stats by day of week / month of year
   - Delistings
   - Missing dates

   Describe and test simple hypotheses about the standard deviation of stock returns. Pay attention to cross-sectional vs time-series aggregation of data. (2 weeks)

2. **CRSP Event Study Project**
   Using the CRSP database, formulate and test hypotheses regarding return and volume behavior around stock splits. (2 weeks)


3. **CRSP-Compustat Project**
Obtaining leverage information from Compustat and returns data from CRSP, formulate and test hypotheses relating returns to beta and book/market ratios. Use Fama-MacBeth regressions to test your hypotheses in the context of the cross-sectional of stock returns. (2 weeks)

4. **Execucomp Project**
Merge data from Execucomp with data from CRSP and Compustat. Develop and test hypotheses that relate compensation to risk (beta and SD). (1-week)

5. **CRSP MF Project**
Using the CRSP Survivorship Free Mutual Fund database, characterize the distribution of mutual fund returns by fund age, size, style, fees, and turnover. Use monthly return data to construct a panel of rolling 5-year portfolio periods. Develop and test hypotheses that relate risk-adjusted performance to fund age, size, style, fees, and turnover. (2 weeks)

6. **CRSP MF Holdings Project**
Using the CRSP Survivorship Free Mutual Fund database, merge the MF holdings with CRSP data on spreads and volume. Compute and test hypotheses about the liquidity of each fund’s holdings, as measured by the average spread and volume of its holdings. (1-week)

7. **Dealscan and Mark-to-Market (Loan) Pricing database Project**
Merge data from Dealscan or the Loan Pricing Database with one of our other databases. Develop and test basic hypotheses relating variables from the new database to the existing one. (1-week)


9. **Supplemental Data Project**: Merge data from one of our datasets with a new supplemental panel dataset. Develop and test basic hypotheses relating the new variables and the existing data. Suggestions for variables to merge one: firm CUSIPS, firm tickers, Executive names, and firm Zip codes. Possible sources of new data: US Census, SEC EDGAR, FDIC, NYSE, FEC, etc. (1-week)

10. **Supplemental Sample Project**: *(Time permitting)* Build a sample of under-studied observations from one or more of the databases given above. Develop and test hypotheses relating this sample and a matched same of more typical firms. Be careful about statistical regression to the mean. (1-week)

Examples: ETFs, ETNs, ADRs, REITs, Closed-end Funds, dead funds, delisted stocks.
Required topics:
You must use each of the following procedures/methods in at least one project:

1. Probit or Logit
2. Interaction terms
3. 2-stage least squared and/or Instrumental Variables
4. Orthogonalization
5. Fama-MacBeth style regressions
6. 3-factor model of stock returns
7. A simulation of error rates
8. Data from Bloomberg
9. AR or MA corrections (Proc Autoreg, Times Series, VARMAX, or ARIMAX)
10. Rolling portfolio periods
11. Matched sample
12. Non-parametric statistics
13. Fixed effects
14. Clustering adjustments
15. HCC error adjustments
## Tentative Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1/16</td>
<td>Course Introduction and Overview</td>
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<tr>
<td></td>
<td>Review of resources: Programs, Journals and Databases.</td>
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<tr>
<td>1/23</td>
<td>CRSP Project. Introductory Presentation 1:</td>
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<td>1/30</td>
<td>CRSP Project. Analysis Presentation 1:</td>
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<td>2/6</td>
<td>CRSP Event Study Project: Introductory Presentation 2:</td>
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<tr>
<td>2/13</td>
<td>CRSP Event Study Project: Analysis Presentation 2:</td>
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<td>2/20</td>
<td>CRSP-Compustat Project. Introductory Presentation 3:</td>
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<tr>
<td>2/27</td>
<td>CRSP-Compustat Project. Analysis Presentation 3:</td>
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<tr>
<td>3/6</td>
<td>Execucomp Project. Presentation 4:</td>
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<tr>
<td>3/13</td>
<td>No Class – Spring Break</td>
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<tr>
<td>3/20</td>
<td>CRSP MF Project. Introductory Presentation 5:</td>
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<tr>
<td>3/22</td>
<td>Mid-term Exam due</td>
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<tr>
<td>3/27</td>
<td>CRSP MF Project. Analysis Presentation 5:</td>
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<tr>
<td>4/3</td>
<td>CRSP MF Holdings Project. Presentation 6:</td>
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<tr>
<td>4/10</td>
<td>Dealscan Project: Presentation 7:</td>
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<td>4/17</td>
<td>Supplemental TS Project: Presentation 8:</td>
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<td>4/24</td>
<td>Supplemental Data: Presentation 9:</td>
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<tr>
<td>5/1</td>
<td>Review</td>
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<tr>
<td>5/9</td>
<td>Thursday: Final Exam – 12:50-2:50 PM</td>
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