Syllabus (FIN 685) Seminar in Accounting and Finance

SUNY POLYTECHNIC INSTITUTE

SCHOOL OF BUSINESS ADMINISTRATION

Instructor: Matthew Brigida, Ph.D.

Office: Donovan 1277

Office Hours: online

Email: matthew.brigida@sunypoly.edu

Class Location: Online (Blackboard)

Supplementary Material: Financial-Education Site

Course Structure and Interaction

- All interaction will be through Blackboard, with a majority taking place on the discussion boards and via BlackBoard Collaborate vidoes. Since we may not be able to meet at the same time, you'll want to check the `Recordings` section of Collaborate.
- The Blackboard discussion boards should generally be used for any course questions. Only use email for questions that contain personal information.
- There may be some useful videos at the following links: Investments and Portfolio Theory. I'll let you know if I post anything particularly useful here.

Academic Honesty Policy

Academic dishonesty will not be tolerated in this class. Cheating on quizzes, examinations, and other forms of dishonesty (e.g., plagiarism, collusion, and falsification of data) will be dealt with in a serious and formal manner. The penalty for academic dishonesty in this class will be course failure. That is, any student who is found to be cheating or engaged in other academically dishonest behavior will be failed for this course for this semester. Course withdrawals to avoid such a failure will not be permitted. As a student, you have a responsibility to become familiar with the Academic Honesty Policy found in the Student Rights, Regulations, and Procedures Handbook.

Online Office Hours

I will be logged on the course throughout the week to answer questions and review the discussions. If a few students have questions on the material, and there is a good time to meet, I'll log into BB Collaborate and record the answers.

Students do not need to access the course simultaneously, and therefore have a measure of flexibility regarding when they access the course. However, students should access the course regularly to keep up with assignments, and to maintain a presence in the Discussion Room. Students should also often check their SUNY Poly email account.

Description

From the Course Catalog:

> An integrating experience to apply the varied skills and knowledge accumulated through the required course work to make the student competitive in capital markets. Special emphasis will be upon mastery of body of accounting and financial knowledge including significant current development on the economic and financial scene. Students acquire greater understanding of global capital markets, demonstrate the ability to use the tools and techniques of accounting

and investment analysis in the valuation of assets, and provide a synthesis of all previous related course work. Prerequisites: ACC 520 and FIN 525.

Topics Covered

- General
  - Does Finance Benefit Society?
- Event Studies
  - Event Studies in Economics and Finance
- Capital Structure
  - In Perfect Capital Markets
    - Modigliani, F. and M. Miller "The Cost of Capital, Corporation Finance and the Theory of Investment" American Economic Review, June 1958, 261-297.
  - With Taxes
    - Miller, M., "Debt and Taxes," Journal of Finance, June 1977, 32, 261-276.
  - With Agency Costs
    - Jensen, M. and W. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," Journal of Financial Economics, October 1976, 3, 305-360.
- Adverse Selection
  - Ackerlof, G. A., "The market for lemons: Quality Uncertainty and the Market Mechanism," The Rand Journal of Economics.
- Adverse Selection and Capital Structure
  - Myers, S. and N. Majluf, "Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have," Journal of Financial Economics, June 1984,187-221.
- Accounting Regulation
  - Do the FASB's Standards Add Shareholder Value?
- Accounting Disclosure
  - Einhorn, E. and A. Ziv (2012).Biased Voluntary Disclosure, Review of Accounting Studies.
- Dividend Policy
  - Black, F., "The Dividend Puzzle", The Journal of Portfolio Management, (Dec 1996): 8-12.
- The Market for Corporate Control
  - Size, ownership and the market for corporate control—Robinson, David T., J. Corporate Finance 2009
  - IPOs/SEOs
    - A review of IPO activity, pricing, and allocations
    - Why has IPO underpricing changes over time?
    - Market Making Contracts, Firm Value, and the IPO Decision
  - Mergers and Acquisitions
    - Do acquisitions relieve target firms' financial constraints?
    - Strategic and Financial Bidders in Takeover Auctions
- Security Design
  - Harris, Milton and Artur Raviv (1989), "The Design of Securities," Journal of Financial Economics, 24, 255-287.
  - Does Delaware law improve firm value?
- Market Structure
  - Kyle, A.(1985) Continuous Auctions and Insider Trading. Econometrica. 1985. 53 (6). 1315-1335.
  - High frequency market microstructure
  - Do Prices Reveal the Presence of Informed Trading?
  - Subsidizing Liquidity: The Impact of Make/Take Fees on Market Quality
  - Cream-skimming or profit-sharing? The curious role of purchased order flow
- Banking post 2008
  - Bank capital and lending relationships
  - Size Anomalies in U.S. Bank Stock Returns
- Auditing

  - Audit Partner Identifcation and Audit Quality
  - Aobdia, Daniel, Lin, Chan-Jane, and Petacchi, Reining. Capital Market Consequences of Audit Partner Quality. Accounting Review. Nov2015, Vol. 90 Issue 6, 2143-2176.
- Artificial Intelligence and Machine Learning in Accounting and Finance
  - McKinsey AI
  - AI: The Next Digital Frontier?
  - Notes from the AI Frontier: Insights from Hundreds of Use Cases
  - Notes from the AI Frontier: Modeling the Impact on the World Economy
  - Notes from the AI Frontier: Applying AI for Social Good

Course Overview and Grade

Your course grade will consist of the (1) research paper discussions, and (2) a research paper. Each is discussed below.

Research Paper Summaries

To earn your research paper summary posts you must:

1. Submit your assigned research paper summary to the appropriate discussion board.
2. Submit your thoughts on AI/ML in Accounting and Finance.
3. Optionally respond to another students' research paper summary.

How to summarize a paper:

1. What is the purpose of the paper? What is the unanswered question in the literature?
2. What analysis method did the author use? Did they use an empirical (statistics), theoretical, or survey approach?
3. What was their conclusion? What effect would this conclusion have on practice?
4. What are the limitations to their conclusion? What sort of assumption did they have to make?
5. Can you think of further research based on the paper?

Thoughts on AI/ML

I have linked to McKinsey discussion papers on AI. Often people tend to discuss whether AI will really revolutionize a particular industry. I would suggest that this discussion is irrelevant, because it is clear from the McKinsey analysis that Accounting and Financial Services firms are making significant investments in the technology. So we don't need to speculate, but we will rather find out in 10 years or so.

But because such large investments are being made by the top Accounting/Finance firms, we should be familiar with the technology, its terms and concepts, and the areas where it will be applied. So read/skim the linked papers and make a post to the AI/ML discussion board. You are free to post any observation you wish. Imagine you are sitting in a department meeting at work, and someone asks what you think of the McKinsey analyses, or your thoughts on AI generally. A couple types of posts you could make are:

- Can you think of any additional applications of AI in Accounting and Finance?
- Do you have any opinions on the impact of AI in the areas listed in the McKinsey analyses? For example do you think loan origination is a particularly advantageous area to apply AI (or do you think it won't work for some reason)?
- Do you find any regulatory hurdles in applying AI solutions to a particular area? For example Congress is presently investigating the effect of AI on loan origination.
- If you have personally implemented an AI solution (outside of work) feel free to post a description. For example, in addition to using AI in research, I have also testing using reinforcement learning for trading as a fun project.

Research Paper

You must also submit a research paper by the date indicated in the course schedule.

The Point of Research

The point of research is to add something **new** to our knowledge of a topic. Research does not simply report what others have done, or speculate on what you **think** may happen.

Paper Categories

1. Empirical
2. Purely Theoretical
3. Survey

I highly recommend that you complete an empirical analysis. It is the type of paper in which you can most easily make an original contribution to the literature. I am also here to help you with statistical methods.

Research Paper Structure

Empirical research papers have a common structure which everyone follows:

1. Introduction and Literature Review: Summarize the state of the literature and on the topic and explain how your present research fits in.
2. Data and Methods
3. Results
4. Conclusion

Theoretical research would replace =Data and Methods= with a theoretical model. For survey articles see Maureen O'Hara's survey of the Market Microstructure literature (also see the warning on survey articles below).

Paper Length

Here are the submission guidelines from the *Journal of Finance* (the top journal in finance):

> Length: Your manuscript must not exceed 60 pages in length (with at least 1.5 line spacing, 12-point font, 1-inch side margins, and 1.5-inch top/bottom margins). This page limit includes internal appendices, reference lists, figures, and tables. Papers exceeding this page limit will be immediately desk-rejected.

Since this is the top journal, they use a rather high 60 page limit. This page limit is consistent with the type of analysis a couple of authors, with a few research assistants, and a couple years can complete. You are working alone, with no research help, in less than a semester, so your analysis should target what we term a 'letters' type paper.

The guidelines from Finance Research Letters are:

> Manuscripts cannot exceed 2500 words. This includes only the body of the text and excludes references, tables, and art. The total length of your paper including any references, tables, and figures cannot exceed 14 pages.

And note this is a *maximum*. You are free to hand in fewer pages. What matters is the content.

Regarding the abstract:

> The first page of your paper should be a title page that includes the names of the authors, the title of the manuscript, and an abstract of not more than 100 words.

Possible Paper Topic Areas

Below are a set of possible paper topics. You do not have to choose one of these topics—in fact many of these are simply topics I am interested in but can't pursue for various reasons. However, reading through these topics should at the very least give you a good idea of the types and breadth of topics you can pursue.

- COVID-19
- Treasuries Exemption from the SLR
- Capital Structure and Lending Policy at US Banks—FDIC Data Set
- Electricity Markets—Real Option Valuation of Power Plants, Renewable Power Integration
- High-Frequency Trading
- Energy Markets
- Crypotocurrency Markets
- A case study outlining the effect of AI/ML in Accounting and Finance

Caution Regarding Survey Articles, Read This! You are much more likely to write a good research paper (and receive a higher score) if you write an empirical paper. This is also fairly easy. Gather some relevant data, summarize and visualize it, test a few hypotheses via appropriate regressions, and you have a paper. I will also not take off many points if your statistical methods are not entirely correct. I have also provided you with data.

Often students will attempt a survey article, but what they hand in is a book report. Since this is not research they receive a very low score. Research should add something new and not simply summarize what is out there. A proper survey article (see Maureen O'Hara's survey of Market Microstructure) will summarize a topic with an extraordinary amount of research and then point out gaps for additional research. That is the topic is so active that few understand everything going on in it and don't know where to begin. The survey provides this. A survey article, arguably, is much harder than an empirical paper. Only do a survey if you are interested in reading 40+ journal articles and learning everything about a topic. Lastly, you must cite peer-reviewed research in a journal article. You should not cite newspapers, internet sources, or anything other than peer-reviewed research.

All journals are not the same quality, and some are not reputable. If you are going to do a survey article you should learn which journals are reputable—see the journals for the research papers I posted. You will receive a low score if you cite bad journals.

General Notes on Writing Research Papers

Some Points from J. Cochrane

- Verbatim quotes in a research paper should be kept to a minimum. Make a note of how many quotes were in the research paper you summarized. A few students each semester will try and hand in a paper that has a significant portion copied and pasted from other papers. They think that because they cite the other paper this is OK. It is not. You should write in your own words, and if there is something you don't know how to say, then you have to take the time to understand it better. So you can summarize another paper's results and cite it, but not copy and paste within quotations and cite.

Course Communication

All communication will be through Blackboard and email. If you have question you are strongly encouraged to post it to a discussion forum instead of emailing me. This way, other students can get the benefit of the question and answer. It also saves me from answering the same question many times via email, and frees me up to answer more questions and generally provide more effective instruction for you.

Grading

Item	Points
Paper Summaries	40
Research Paper	60
Total Points	100

Final grades will be assigned according to the following scale:

- 90 - 100 A
- 80 - 89.9 B
- 70 - 79.9 C
- 60 - 69.9 D
- $<$ 60 F

+/- grades may be assigned at the instructors discretion.

Tentative Outline/Schedule

- June 18: Research paper summary and AI/ML opinion due.
- June 18: Post your paper idea with a description of data you intend to use to the discussion board.
- July 23: Research Paper due.

Note these are due dates. I suggest you don't wait until the due date to submit your summaries/paper. For example, your research paper summary can be done in a single afternoon, so it would make sense to get this done as soon as possible so you can move on to your paper.

General Notes

- All times referred to in this course are Eastern Standard—unless otherwise indicated.
- There will be no make up or extra points assignments.
- Plaigarism will result in prosecution to the fullest extent possible under university rules.
- You are responsible for material covered in the online discussion, as well as text material.
- **Internet Access:** This course requires that you have regular access to the internet to submit work. You should not take this course if you plan on being in an area with insufficient internet access. "My internet was down for a week" is not an acceptable reason to hand in late work.
- **Adding or Dropping the Course:** To add or drop the course the student should consult the university guidelines and withdrawal dates (as well as thier advisor). The course instructor is not involved in a student's adding or withdrawing from the course.
- **Software:** You may use word processing and spreadsheet software in this course. Common examples of such software are Microsoft Word and Excel. However, there is no need to buy this software if you don't already have it. There are many free (open-source) alternatives which are just as good (and which allow you to save/read files as .doc(x), .pdf, and .xls(x)). For example I use LibreOffice (http://www.libreoffice.org).

COVID-19

- Use a breakpoint analysis to determine when market volatility increased in the beginning of the COVID crisis. This is an estimate of when the market realized there was a problem. You can also see if certain sectors of the economy reacted earlier using ETFs.

Treasuries Exemption from the SLR

In response to COVID-19 the Fed made Treasury securities exempt from the supplementary leverage ratio (SLR) calculation. This increased bank leverage ratios with the hope that they would increase lending. The fed announced in March 2021 that the exemption would end at the end of Q1 2021. An interesting analysis

would be to determine whether the exemption affected small-business or other lending. This analysis may be a bit difficult however.

An easier, and still interesting, analysis would be to determine the exact date the Fed announced the end of the exemption. There was a fair amount of disagreement about whether the Fed would end the exemption prior to the announcement. Then run an event study to determine bank cumulative abnormal returns due to the announcement. This will allow you to conclude something like, "continuing the exemption was worth $X billion to the banking industry."

Banking Analyses

- Were large and regional banks affected differently by the COVID-19 pandemic? You can use easily-available ETF data for this analysis—a regional bank ETF vs the total banking sector ETF (XLF) which is dominated by the larger banks.

I have created this panel data set which I used in this paper. You can use this data set to estimate the relationship between a bank's capital structure and aspects of its loan portfolio or performance.

- Do higher levels of equity in a banks capital structure lead to lower profitability? This analysis would be best done in R or Python instead of Excel.
- Do declines in the value of the US dollar affect the number of foreign acquisitions of US firms (use M&A data set)?
- Do Minority-Owned Financial Institutions have higher costs of capital?
- Do ETNs track an index more closely than ETFs?
- How large is the tracking error for 2 and 3 times ETFs?

You may want to look at the paper, "Bank Capital and Lending Relationships" (and the papers that cited it) prior to starting your analysis.

- The number of banks in the US has been steadily declining. You can use my panel data set to do an analysis which addresses which types of banks is this mainly affecting, and why.

High Frequency Trading (HFT)

- Are there intra-day patterns in HFT data?
- How do bid-ask spreads vary by firm size?
- Statistical analyses to identify, for example, the impact of HFT on market efficiency.
- Survey the effect of Regulation NMS on market structure and the rise of HFT.

Cryptocurrency Markets

There are a couple very interesting aspects to cryptocurrencies and cryptocurrency markets.

- Relationships between the behavior of various currencies. Do Bitcoin returns predict Ethereum returns? This is an exercise in time series analysis, and to be done correctly you should use the idea of cointegration.
- Did the introduction of CME Futures on Bitcoin affect trading in Bitcoin itself? This is a test of whether the futures contract can affect the underlying asset. I have the top-of-book (millisecond time-stamped) built for Bitcoin Futures and the underlying index around the introduction of the futures contract. You can use whatever empirical methods you are comfortable with to investigate whether trading in Bitcoin changed.

- Crypto (particularly Bitcoin) is often referred to as *digital gold*. Has its introduction changed the relationship between inflation and actual gold? Test for a changing correlation before and after the introduction of Bitcoin. Note, you can use ETFs for gold (such as GLD).
- An analysis of the extent of asymmetric information in cryptocurrency markets and the effect on market viability.
- An analysis of Libra—how does it differ from other currencies and how is it similar?
- A survey of the various trading venues for cryptocurrencies and their derivatives.
- A survey of various cryptocurrency market APIs.

Electricity Markets

There is a large amount of data on electricity (and electricity derivative) markets freely available from the Independent System Operators (NYISO, NEPOOL, ERCOT, etc).

- Is wholesale electricity price volatility dependent on how the electricity is generated (via nuclear, hydro, natural gas, etc)?
- A survey of the various electricity market structures around the US.
- How can we incentivize overcapacity within a deregulated utility structure? Survey the problem and possible solutions, hopefully adding ideas of your own.
- Survey the percent renewables by ISO and the possible effect on market prices.

Energy Markets

See the EIA API for data.

- Has the correlation between the stock market and crude oil changed since the COVID-19 outbreak? Has a predictive relationship changed? There has historically been various correlations and predictive relationships between crude oil and stock. For example, since crude oil is an input into most products, an increase in crude oil prices has tended to increase prices, lower quantity sold, and therefore lower *future* stock prices.
- Survey the literature on the relationship between natural gas and crude oil prices.
- Survey accounting of oil reserves (explaining various definitions of 'proven').

AI/ML in Finance and Accounting

The industry with the largest investment in Artificial Intelligence and Machine Learning (AI/ML) is Financial and Accounting Services (cite McKinsey document).

Pipeline Risk in Pharma

This paper and this summary discusses a possible method to reduce pipeline risk—the risk that a potential drug or device is delayed or not approved. The methods face significant hurdles. You could write a short paper highlighting why. Hint: what effect does large amounts of asymmetric information have on market viability? This paper would be a good for someone interested in a 'qualitative' analysis, however be sure to cite relevant peer reviewed research on market viability. You are likely to earn a much higher score if you are able to gather relevant data and add an empirical portion.

BRTI Tick Data

Below are millisecond data for the Bitcoin Real-Time Index on Jan 3, 2018. The data are pulled via the IB API. With data of this type, you can discover interesting features of market data—for example, notice

the "last trade" is often outside of the bid/offer. This is particularly important to understand when trading illiquid contracts, such as some options. You can left-click your mouse, and drag, to zoom in on subintervals.

Using such data is not necessary in this course, though if you would like to use similar data in your analysis let me know. I can either pull the data you want for you, or I can request an account for you where you can pull the data. You can also use a week of millisecond data I have already downloaded.

Some Notes on Spreadsheet Design

The following are notes from another course I teach. You likely will not have to submit any spreadsheets in this course. However, I'll leave these notes here because there is certainly no harm in reading (or rereading) them.

You should construct your spreadsheet as if you were an analyst at a company, and you were going to submit the spreadsheet to upper management. Therefore, getting the correct answer can be considered the minimal amount of work. The spreadsheet should be easily readable and organized. There are a couple of reasons why this is important: (1) management often will check some numbers (or maybe change a few inputs if they have more up to date information) and it will reflect very poorly on you if they have to search around through a muddled and ill-conceived spreadsheet; and (2) anyone should be able to pick up your spreadsheet and complete it if you are not there (vacation, sick, or hopefully promoted). Following are a couple tips on spreadsheet design, though it is far from exhaustive.

- Hard-code as little as possible. You want a few cells for your inputs, or a place where you put your data, and then every other cell is linked and feeds off of these input cells. This way, to update your spreadsheet you simply change the inputs or drop in new data.
- Take the time to label cells, and put in appropriate comments if necessary - though comments should not be used excessively. Also, it is common to change the cell color depending on whether it is hard-coded (an input) or a formula. This way you (or anyone else) can immediately look at a cell and tell whether it is one in which you can type (an input). Don't forget to include a key.
- It is often better to add tabs to a spreadsheet than continue calculations on one tab. You can easily page through spreadsheet tabs with `Ctrl+Shift` and `Page-up` or `Page-down`.
- Pivot tables. While we probably won't need them in this course, you should nonetheless get to know them. Pivot tables are incredibly useful for summarizing data, and it is very possible you will be asked in an interview whether you are familiar with them. Similarly, get to know VLOOKUP.
- If you are inputting a long formula, then break the calculation into multiple cells. This makes it much easier to tell where a mistake was made - and everyone always spends a fair amount of time looking for errors.
- Excel has many built in formulas which can be useful, however it is important that you understand what the formula is doing to use them. Blindly applying a formula can lead to trouble. For example, if you use the IRR() function on cash flows with multiple roots, the formula will return the first root it finds without signaling to you that there are other roots. Also, there are Excel formulas that are flat out incorrect - in particular the NPV() function. So, use a function if it saves time, but first be sure you know what the function is doing and verify it works. That said, in my experience it is better (and faster) to input your own formula instead of using Excel's. You often have to break the calculation into a couple of steps, but this can be done quickly, and the result is a spreadsheet that you know works and is easily auditable.

Data

Energy

- NYISO
- PJM
- EIA API

Banking

- HMDA
- FDIC

Stock Market

-IEX API