## Economics 40357
## University of Notre Dame
## Financial Econometrics
Fall 2020


**Instructor:** Professor Nelson Mark
**Office:** Jenkins-Nanovic 3040.
**Office Hours:** M,W, 12:45-2:00 p.m. Zoom and by appointment.
**E-mail:** nmark@nd.edu
**Website:** https://www3.nd.edu/~nmark/FinancialEconometrics/FinancialEconometrics.htm


**Class Time and Location: M,W, 11:10 - 12:25 O'Neil S120**

**Your instructor,** is Nelson C Mark, holder of the Alfred C DeCrane Jr. Professorship in International Economics. He was an economics major at UC Santa Barbara, and got his PhD at the University of Chicago where he wrote his dissertation under the direction of the great Michael Mussa. Professor Mark worked as an economist at THE Ohio State University for 20 years, and has been at Notre Dame for 17. He is a Research Associate at the National Bureau of Economic Research, has been a consultant to the Federal Reserve Board, the Federal Reserve Bank of St. Louis, the International Monetary Fund, and a fellow at the Hong Kong Monetary Authority. He also served as the Acting Director for the Liu Institute for Asia and Asian Studies from 2013-2015.

Academics are ranked and assessed on the number and quality of their peer-reviewed research publications and citations to their work. Prof. Mark currently has **10,125** Google Scholar citations–the second highest in the ND economics department. Of particular relevance to this course, Prof. Mark has published many applied econometrics papers on finance and international finance issues and two papers on theoretical econometrics, one of which is an estimator that has been programmed up in Eviews (see Eviews User's Guide II section on panel Cointegration Estimation).

**Textbook:** *Introductory Econometrics for Finance*, 4th edition, by Chris Brooks, Cambridge University Press. Buy the paperback version online, either from Cambridge University Press or Amazon. It is *not* available at the ND bookstore.


**Course Description**: This course covers statistics and econometric methods used in financial economics. We will focus on applications and intuition. Computations will either be done primarily in **Eviews,** which is very good for the econometrics of time-series. Probably, you've been indoctrinated to believe that Stata is the best and only econometrics software that is worth using, but that is not true. Eviews is used extensively by central banks around the world including the Federal Reserve, the IMF and the World Bank. It is also widely used in the private sector (see https://www.eviews.com/general/about_us.html.

There is a student version of Eviews, called the University Edition, available for $49.95 that runs on Mac or Windows. This is the same as the full version except the license expires in 6 months. The full version of Eviews is installed on university computers in the various clusters. Early in the semester, I will devote a class session to giving you an Eviews tutorial on Zoom. To follow along without going to the clusters, please install the free student version of Eviews lite. http://www.eviews.com/EViews11/EViews11Univ/evuniv11.html. This capacity of this free version is limited and probably not sufficient for the serious work in this course.

**Professor Mark does not read minds**. If you don't understand something, **speak up**, otherwise Prof. Mark will never know. Prof. Mark wants you to learn financial econometrics and to have fun doing so. If you do not understand something, be brave and ask for help or another explanation. It is true, that many of us fear appearing 'stupid' for asking questions. Get over it.

### Grades

| Assignment | Due | Weight |
|---|---|---|
| Problem sets | Approx. every 2 weeks | 25% |
| Midterm | Wed. 23 September | 25% |
| Paper | Wed. 4 November | 25% |
| Final | TBA | 25% |

The grade composition for your final grade is based on the scale,

| | |
|---|---|
| A | $93.333 - 100$ |
| A- | $90.0 - 93.332$ |
| B+ | $86.666 - 89.99$ |
| B | $83.333 - 86.665$ |
| B- | $80.0 - 83.332$ |
| C+ | $76.666 - 79.999$ |
| C | $73.333 - 76.665$ |

1. Form a study group to work on the problem sets, up to 4 people per group. If groups don't endogenously form, I'll randomly assign members to groups. Your group will submit **one copy** of the problem set write-up and an **appendix** where each group member attaches their own copies of the computations. Each group member needs to individually perform the econometric analysis for their own learning and to verify/double check the group's computations. The problem sets are an important learning device. If you just free-ride on the work of others and don't learn the material, you will suffer on the exams. To help reduce the free-riding problem, you will confidentally grade your other group members on their effort and contribution. We will plan for you to submit the problem sets electronically on **Gradescope.**

2. **Midterm and Final** will be take-home exams. You will have 24 hours to work on the exams. They will be open book and open note, but individual efforts, i.e., **no collaborations with other people.** We will plan for you to submit the exmas electronically on **Gradescope**

3. **A short paper** will that involves performing an econometric analysis of some finance issue. The paper is also a group project, presumeably with your problem set study group. Use your imagination and work on a problem that you find interesting (and hopefully fun). Some examples of topics from earlier classes: (1) How does Notre Dame Football Perform Against the Spread? (2) The Effect of a Plane Crash on Airline Stocks (3) The Effect of Federal Funds Surprises on the Chinese Stock Market (4) Does Stock Market Volatility Matter for Economic Growth? (5) Which Firms Are Most Affected By Trump's Tweets On Trade?

   I'm reserving the last week or so for you to give a brief in-class presentation of your paper. We'll plan to submit the paper on Gradescope.

   Topic must be cleared by me first.

**How to write the paper:**

- Introduction: Background and description of the problem
- Data Description
- Empirical specification. Write out the equations you are estimating.
- Results: report in tables
- Conclusion
- This is **not** a full-fledged academic term paper. It is a short, to the point, econometric analysis of a finance-related question. Think of it as the analysis behind a newsletter a financial firm would send to its econometrically savy (ha!) clients. Body of paper not to exceed **8 pages** in length, 11 point font, 1.5 line spacing (not including tables, figures, and bibliography) The format includes a separate title page with an abstract summarizing the paper; a complete list of references and a list of data sources. The presentation should be explicit enough for someone to to replicate all results. Data sources must be documented and modeling choices should be defended. You must clearly explain the question being addressed, why it is interesting, and what you have learned. We are aiming for short, polished papers. Don't try to use the same paper to satisfy requirements for multiple courses. Paper is due Wednesday **4 November** before class.

**Health and Safety Protocols:** In this class, as elsewhere on campus, students must comply with all University health and safety protocols, including:

- Face masks that completely cover the nose and mouth will be worn by all students and instructors;
- Physical distancing will be maintained in all instructional spaces;
- Students will sit in assigned seats throughout the semester, which will be documented by faculty for purposes of any needed contact tracing; and
- Protocols for staged entry to and exit from classrooms and instructional spaces will be followed.

We are part of a community of learning in which compassionate care for one another is part of our spiritual and social charter. Consequently, compliance with these protocols is an expectation for everyone enrolled in this course. If a student refuses to comply with the University's health and safety protocols, the student must leave the classroom and will earn an unexcused absence for the class period and any associated assignments/assessments for the day. Persistent deviation from expected health and safety guidelines may be considered a violation of the University's Standards of Conduct, as articulated in du Lac: A Guide for Student Life, and will be referred accordingly.

**Health Checks and Attendance** Every morning, members of the Notre Dame Community will be asked to complete a daily health check and submit their information via the Return to Campus Advisor application. The health check application will indicate one of the following:

- Student is cleared for class and should attend class in person; or
- Student is advised to stay home to monitor symptoms and should participate in class virtually and complete all assignments and assessments; or
- Student must consult a healthcare provider and should contact University Health Services (UHS) for an assessment. In the meantime, the student should participate in class virtually and complete all assignments and assessments. Depending on the medical assessment, UHS will follow the University's standard protocol for obtaining an excused absence for medical reasons.

Here is a brief list of **topics**. See the course page for detailed descriptions and assignments.

1. What is a time series? What is the role of a model? What are time-series models?

2. Review of least squares and time-series regression

3. Some necessary matrix algebra

4. Eviews tutorial

5. Time-series fundamentals–ARIMA models and introduction to forecasting.

6. Impulse response analysis

7. Vector autoregressions and local projections

8. The event study method

9. Volatility and value-at-risk

10. Empirical implementation of the market model and the CAPM

11. Return predictability over long and short horizons and time-varyin grisk premia.

12. Principal components and factor models.

13. Cross-sectional analysis of asset returns

14. Alpha