

# Financial Econometrics

Module 3, year 1

**Olga Kuzmina**

**NES**

okuzmina@nes.ru

**TA:** Konstantin Korotkiy (kkorotkiy@nes.ru)

## Course description

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The goal of this course is to familiarize you with basic econometric techniques and methods used for the analysis of financial data. We will discuss both cross-sectional and time-series data.

There is no high math in this course, but you should be able to handle some algebra. The course builds on your previous coverage of Introductory Statistics during the math refresher.

There will be 4 seminars devoted to the econometric methods in general and the suggested software in particular. During these seminars the teaching assistant will be answering your questions.

## Course requirements, grading, and attendance policies

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Attitude is everything. Bring a mature, professional attitude to class. Attendance on-time is proper business etiquette and being regularly late is unprofessional. Coming in late interrupts the class – respect your colleagues.

The grade for the course will be based on two individual take-home assignments (50% each): one approximately at mid-term, and the other at the end of the course. The data to be analyzed will be provided. To pass the course you have to submit both assignments and receive at least 20 points for each.

I do not have regular office hours. However, I will generally be able to answer questions after the session. In addition, you are always welcome to drop me an email with your question and we may set up an appointment if necessary (usually, before the session).

Please take a minute to reread the NES Honor Code. You must not cheat on the assignments and must report any violations to me.

Finally, I will post all the important information (including lectures and assignments) to my.nes.ru. Please check it on a regular basis.

## Course contents

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Here is the *tentative* (both in content and in order) list of topics for the course:

1. Introduction: What are regressions and what are they used for?  
Linear regression. Univariate case. Basic assumptions. Inferences.  
Reading: B 1, 2.1-2.9; V 2.1-2.4, 2.6

2. Hypothesis testing. Introducing multivariate regressions.  
Different approaches to hypothesis testing. Types of errors.  
Reading: B 2.10-2.16, 3.1-3.3; V 2.5

3. Interpreting and comparing regression models.  
Interpretation of the coefficients. Selecting regressors.  
Reading: B 3.4-3.10; V 2.5, 3.1-3.2

4. Problems with simple OLS:  
Functional form. Multicollinearity. Heteroskedasticity and autocorrelation.  
Panel data.  
Reading: B 4.8-4.14, 10; V 2.8, 3.3, 4.1-4.3, 4.6-4.7, 4.10

(if time permits)  
Endogeneity and instrumental variables:  
Nature of the problem. Finding valid instruments.  
Reading: V 5.1-5.3

5. Models with limited dependent variables:  
Binary choice and multi-response problem.  
Reading: B 11; V 7.1-7.4

6 and 7. Introduction to time-series analysis and forecasting:  
Stationarity, unit roots. AR and ADL models.  
Reading: B 5.1-5.13, 7.1-7.2; V 8.1-8.4, 8.6-8.8

## **Sample Tasks for Course Evaluation**

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1. (Based on the data on inflation and unemployment)

- a) Estimate an autoregressive process for inflation. Use an information criterion to choose the proper number of lags.
- b) Analyze how inflation depends on different lags of unemployment. Find the ADL(p,r) model which you think is the most appropriate.
- c) Does unemployment Granger-cause inflation? What does it mean in simple words?

2. (Based on the data on consumer loans)

Self-employed might systematically differ in their financial position. After you control for P/I ratio and consumer credit score are self-employment still more likely to be denied their mortgage application? How do the results differ from the results that do not control for financial variables? Why? Provide results for linear and probit models.

## **Course materials**

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The Required Text:

(B) Chris Brooks "Introductory Econometrics for Finance".

Recommended Text:

(V) Marno Verbeek "A guide to Modern Econometrics", 2nd edition, Wiley.

I may also occasionally post extra papers for you to read before or after the class.

**Academic integrity policy**

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.