EC220 Introduction to Econometrics (Full Year 2014/15)

View Online

53 items

Course Textbooks (4 items)

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | You should read chapters 1 to 15 of this book during the course of the year

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | This is a book we are currently writing but it is not yet in print. A copy of the manuscript will be available in Moodle. You should read the book except for chapter 4 during the course of the year

Super crunchers: how anything can be predicted - Ayres, Ian, 2008
Book | **Background** | This is a more fun to read trade book arguing that statistical analysis and econometrics is more and more replacing traditional experts. It provides some motivation why you might want to learn econometrics.

Introductory econometrics: a modern approach - Wooldridge, Jeffrey M.
Book | **Background** | An alternative source if you don't like Stock and Watson

Course Content (49 items)

Topic 1: Introduction to Causal Questions (2 items)
This topic provides overview and background for most of the stuff we do in the course

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | chapter 1

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | Introduction

Topic 2: Counterfactuals and Selection Bias (2 items)
Important background to a constant theme throughout the course. You need to be able to spot selection bias when it occurs, derivations not needed.

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | section 1.1

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Background** | section 13.1

Topic 3: Health Insurance and Experiments (3 items)

Background and motivation for much of what we do in econometrics. You should understand how randomisation solves selection bias and creates balance.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | section 13.1 and 13.2

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | Essential | sections 1.1. and 1.2

Esther Duflo: Social experiments to fight poverty | Video on TED.com
Webpage | Background

Topic 4: The Standard Error of the Mean (2 items)

Review of some basics from your statistics course.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | chapter 3

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | Essential | appendix to chapter 1

Topic 5: Statistical Inference for Di¤erences in Means (2 items)

Review of some basics from your statistics course. Derivations not needed but you have to be able to formulate hypotheses, and be thoroughly familiar with how to use t-stats, p-values, and confidence intervals in practice.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | chapter 3

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | Essential | appendix to chapter 1

Topic 6: Matching (1 items)

This topic and the next provide motivation for why we do regression. There is a lot of overview in this lecture—this will be useful to recap at the end of MT when you have learned all the details.

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | Essential | sections 2.1 and 2.2

Topic 7: Omitted Variables Bias (1 items)

First introduction to an important topic: the form selection bias takes in a regression context. You got to know this material cold by the end of the course.

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | Essential | section 2.3

Topic 8: Bivariate Regression (2 items)

Another motivation for regression. A lot of basics we build on later in the course.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | sections 4.1 and 4.2

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | appendix to chapter 2

Topic 9: Properties of Regression (2 items)

You need to know what the R-square is and means, derivations not needed. Reparameterisations are important to know. You have to be able to work out the math if they are not intuitive for you.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | section 4.3

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | appendix to chapter 2

Topic 10: Inference in Bivariate Regression (3 items)

Understanding the ingredients in the standard error for the regression slope is key to understanding a lot of later material about regression, not just hypothesis testing. Derivations not needed, just use robust standard errors in your work.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | sections 4.4. and 4.5 and chapter 5

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Background** | chapter 17; this is a more mathematical treatment and beyond the scope of this course

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | appendix to chapter 2

Topic 11: Multivariate Regression (2 items)

OVB again, and you need to understand the idea of regression anatomy. Regression anatomy makes it straightforward to think about other results for multiple regression later on; we will use it often. Derivations not needed.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | Chapter 6

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | appendix to chapter 2

Topic 12: Inference in Multivariate Regression (3 items)

Understanding how the standard error in a multivariate regression relates to that in a

bivariate regression will help you understand relationships between regressors later on. You need to know all the material on testing,

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | chapter 7

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Background | chapter 18; this is a more mathematical treatment and beyond the scope of this course

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | Essential | appendix to chapter 2

Topic 13: Functional Form in Regression (1 items)

I am fairly relaxed about functional form issues but you will have to know how to interpret parameters from a non-linear regression, and particularly regressions with logs.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | sections 8.1 and 8.2

Topic 14: Dummy Variables (1 items)

Dummies come up often and you need to understand how to interpret or specify dummy variable regressions.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | section 5.3

Topic 15: Interactions and Testing (1 items)

Dummies and interactions are important; we use them all the time. This is the foundation for differences-in-differences in LT, for example. Material you need to know.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | sections 8.4 and 8.5

Topic 16: Controls and Causality (1 items)

Bad control, when to use uncorrelated covariates, and multicollinearity are issues you need to understand to interpret regression output. Derivations not needed.

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | Background | section 2.3 and subsection "Beware Bad Control" on p. 214 - 216 (June 2014 draft) or p. 214 - 217 (published book)

Topic 17: Measurement Error (2 items)

You need to understand the results in order to be able to interpret regression results. Derivations not needed.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011

Book | **Essential** | pages 361 - 364

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | appendix to chapter 6

Topic 18: Internal and External Validity, Causal Estimates versus Prediction (1 items)

Internal versus external validity is mostly background. It is key to understand when a question calls for a causal regression and when a prediction suffices.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | Chapter 9

Topic 19: Weighting (1 items)

When you take an econometrics course you should have heard about weighted regression. But nothing really big hinges on this and it's not a topic that lends itself easily towards exam questions.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | section 17.5

Topic 20: Instrumental Variables: A Chain Reaction (1 items)

The motivation for instrumental variables. IV solves the compliance issue in experiments which don't assign the treatment directly. This is the first step for understanding how IV works.

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | section 3.1

Topic 21: Two Stage Least Squares (1 items)

The generalization of the basic IV idea to a regression framework. This is how IV is done in practice and the example gives you an idea about the applicability of IV beyond experiments.

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | section 3.3

Topic 22: Understanding Instrumental Variables (2 items)

This lecture puts the material on IV all together, and contrasts the way IV solves the OVB problem to the regression approach. This is very important; something you need to know.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | Chapter 12, sections 12.1 to 12.3

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | appendix to chapter 3

Topic 23: Supply and Demand in the Foulton Fish Market (1 items)

Simultaneous equations, like supply and demand, are the mother of IV. But this is a more complex application than IV to solve OVB. IV solves the reverse causality problem (and really is the only method we have to get at that issue). You need to understand this material and the language it generates.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | Chapter 12, sections 12.4 to 12.6

Topic 24: Differences in Differences: A Mississippi Experiment (2 items)

The 2 x 2 diff-in-diff model embodies the basic idea of using variation over time, holding group effects constant. The basic assumptions here (additive group effects, parallel trends) underlie the strategies we pursue with panel data.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | sections 10.1 and 10.2

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | section 5.1

Topic 25: Panel Data: Drinking, Driving, and Dying (2 items)

Extends the 2 x 2 diff-in-diff model to N x T dimensions. The link between the previous topic and the next

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | section 10.3 and 10.4

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | section 5.2

Topic 26: Panel Data and Fixed Effects (2 items)

How diff-in-diff or fixed effects methods are mostly carried out in practice. This how you will most likely run into them (both in empirical practice and in exam questions).

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | sections 10.5 and 10.6

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | **Essential** | appendix to chapter 5

Topic 27: Introduction to Time Series (1 items)

Introduces basic concepts. You will need to know what stationarity, a correlogram, and an AR(1) means.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | **Essential** | Chapter 14, sections 14.1 to 14.3

Topic 28: Nonstationary Time Series (1 items)

The basics about nonstationarity and what problems it leads to. You need to understand these problems and be able to spot them.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | Section 14.6

Topic 29: Detecting Nonstationarity: Dickey-Fuller Test (1 items)

DF and ADF tests lend themselves towards exam questions. Know how to determine the order of integration and how to render your series I(0).

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | Section 14.6

Topic 30: Time Series Regression and Dynamic Causal Effects (1 items)

The meat of the time series lectures as this is what we would be using time series for.

Introduction to econometrics - Stock, James H, Watson, Mark W., 2011
Book | Essential | Section 14.4 and chapter 15

Topic 31: Putting it all Together: The Returns to Schooling (1 items)

An applied example taking you through various of the methods we have studied. Nothing new but good review.

Mastering 'Metrics: The Path from Cause to Effect - Joshua D. Angrist, Jörn-Steffen Pischke
Book | Essential | Chapter 6