



Applied Econometrics Training Course: Regression, Panel Data and Causal Impact



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Introduction:

Applied econometrics training on regression, panel data and causal impact is a 5-day course for economic analysis, policy evaluation and planning teams that ends with an Econometric Impact Brief built on a case dataset. Organisations often approve price changes, subsidies and programmes on correlations that confuse association with effect, ignore biased standard errors and misread elasticities. Nominees already run regressions or commission economic studies and learn through a modelling build that moves from estimation and diagnostics to difference-in-differences and panel estimates. CoreConcept Training Center delivers this applied econometrics course.

Course Objectives:

- Frame pricing, subsidy and programme questions as causal questions with a stated counterfactual and an identification strategy
- Estimate multiple OLS regressions and interpret coefficients, standard errors and confidence intervals in the units decision makers use
- Diagnose heteroskedasticity, multicollinearity and autocorrelation and apply robust or corrected standard errors before reporting results
- Specify dummy variables, interaction terms and log-log forms to measure segment effects and price or income elasticities
- Select time-series and panel estimators by testing stationarity and choosing between fixed and random effects
- Estimate policy effects with difference-in-differences and judge instrumental variable estimates, then report them in a decision brief

Target Audience:

- Economic analysis teams responsible for demand, price and market studies used in business or public decisions
 - Policy evaluation teams responsible for measuring the effect of programmes, subsidies and regulations on outcomes
 - Economic planning teams responsible for sector models, projections of drivers and policy option papers
 - Commercial and pricing analytics teams responsible for elasticity estimates and promotion effect measurement
 - Research and statistics units responsible for preparing survey, administrative and panel datasets for modelling
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Course Outline:

Day 1: Econometric Thinking, Causal Questions and Data Structures

- Causal Question Framing for Policy and Pricing Decisions
- Potential Outcomes Framework and Counterfactual Reasoning Basics
- Cross-Section, Time-Series and Panel Data Structure Mapping
- Omitted Variable Bias and Reverse Causality Warning Signs
- Econometric Analysis Plan for a Live Policy Question

Day 2: OLS Estimation, Diagnostics and Model Specification

- Multiple OLS Regression Estimation and Coefficient Interpretation
- Gauss-Markov Assumptions and Standard Error Interpretation
- Heteroskedasticity Detection with Breusch-Pagan and Robust Errors
- Multicollinearity Diagnosis with Variance Inflation Factors
- Autocorrelation Testing with Durbin-Watson and Newey-West Corrections

Day 3: Functional Forms, Elasticities, Time-Series and Panel Models

- Dummy Variables and Interaction Terms for Segment Effects
- Log-Log Specification for Price and Income Elasticities
- Augmented Dickey-Fuller Unit Root Tests for Stationarity
- ARIMA Overview and Cointegration Intuition for Long-Run Relations
- Fixed Effects, Random Effects and the Hausman Test

Day 4: Causal Inference Designs, Validity Threats and Robustness

- Difference-in-Differences Design with Parallel Trends Checks
- Event Study Plots for Pre-Trend and Dynamic Effects
- Instrumental Variables and Two-Stage Least Squares Overview
- Weak Instrument and Exclusion Restriction Validity Tests
- Placebo Tests, Robustness Tables and Specification Sensitivity Checks

Day 5: Modelling Build and the Econometric Impact Brief

- Case Dataset Cleaning and Variable Construction for Estimation
 - Demand Elasticity Model Build with Diagnostic Corrections
 - Policy Impact Estimation Using Panel or Difference-in-Differences
 - Coefficient Tables Translated into Decision-Maker Narrative Statements
 - Econometric Impact Brief Completion and Peer Review Panel
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Skills You Will Gain:

- Causal Question Framing
- Regression Diagnostics
- Elasticity Estimation
- Unit Root Testing
- Panel Estimator Selection
- Difference-in-Differences Evaluation
- Instrumental Variable Appraisal
- Econometric Results Communication

Why Attend This Course:

- Deliver an Econometric Impact Brief for a case demand or policy dataset to the head of economic analysis and the pricing or policy committee
- Decide whether an estimated price, subsidy or programme effect is credible enough to act on, based on diagnostics and the identifying assumption
- Avoid funding programmes or setting prices on spurious correlations, biased standard errors or non-stationary series that overstate effects
- Share model specification checklists, diagnostic test sequences and results table templates with analysts across the unit

Conclusion:

Back at work, the participant gives the head of economic analysis, the pricing or policy committee and the planning unit an Econometric Impact Brief that states the estimated effect, its confidence interval, the identifying assumption and the conditions under which the result would not hold. Decision makers use it to set prices, adjust subsidy levels or decide whether to scale a programme. After its first use, the unit should review whether the parallel trends, instrument and diagnostic checks still hold on newly released data.

Frequently Asked Questions FAQ:

What should participants know before applied econometrics training on regression, panel data and causal impact?

Participants should already run regressions or review economic studies and be comfortable with means, variance and hypothesis tests. Any statistical software is suitable. Bringing a dataset or a policy question from their own unit helps them apply the modelling build to real work.

How does applied econometrics training on regression, panel data and causal impact differ from a business statistics or forecasting course?

It focuses on estimating causal effects and elasticities rather than describing data or projecting future values. Business statistics courses cover sampling and tests, and forecasting courses optimise prediction accuracy, while this course tests identification, diagnostics and panel or difference-in-differences designs.

Why does applied econometrics need difference-in-differences or instrumental variables rather than a simple regression?

A simple regression on observational data mixes the effect of a policy with other differences between groups. Difference-in-differences removes fixed group differences using a control group and parallel trends, and instrumental variables isolate variation unrelated to hidden factors.

What do participants take back from applied econometrics training on regression, panel data and causal impact?

Participants take back an Econometric Impact Brief for a case dataset, with a specified model, diagnostic results, elasticity or policy effect estimates, robustness checks and a plain-language interpretation, plus checklists and table templates they can reuse on their own data.
