Mostly Harmless Econometrics An Empiricist S Companion

== Selected publications == 63ddb944fc

Jörn-Steffen Pischke S. Mostly harmless econometrics: An empiricist's companion. (2009). , & Pischke, J. Princeton University Jörn-Steffen Pischke is a professor of economics at the London School of Economics. D. Angrist, J. He is known for his work on Applied Econometrics. his work on Applied Econometrics 63ddb944fc

Commonly distinguished differing approaches that have been identified and studied include: 63ddb944fc == Cluster elemental == 63ddb944fc In this sampling plan, the total population is divided into these groups (known as clusters) and a simple random sample of the groups is selected. The elements in each cluster are then sampled. If all elements in each

sampled cluster are sampled, then this is referred to as a "one-stage" cluster sampling plan. If a simple random subsample of elements is selected within each of these groups, this is referred to as a "two-stage" cluster sampling plan. A common motivation for cluster sampling is to reduce the total number of interviews and costs given the desired accuracy. For a fixed sample size, the expected random error is smaller when most of the variation in the population is present internally within the groups, and not between the groups. 63ddb944fc The concept of homogeneity can be applied in many different ways. For certain types of statistical analysis, it is used to look for... 63ddb944fc Homogeneity can be studied to several degrees of complexity. For example, considerations of homoscedasticity examine how much the variability of data-values changes throughout a dataset. However, questions of homogeneity apply to all aspects of statistical distributions, including the location parameter. Thus, a more detailed study would examine changes to the whole of the marginal distribution. An intermediate-level study might move from looking at the variability to studying changes in the skewness. In addition to these, questions of homogeneity also apply to the joint distributions. 63ddb944fc

Regression analysis S. D. quarrés" appears as an appendix. Princeton University In statistical modeling, regression analysis is a statistical method for estimating the relationship between a dependent variable (often called the outcome or response variable, or a label in machine learning parlance) and one or more independent variables (often called regressors, predictors, covariates, explanatory variables or features). , & Pischke, J. Chapter 1 of: Angrist, J. (2008). Mostly Harmless Econometrics: An Empiricist's Companion 63ddb944fc

The intuition behind the RDD is well illustrated using the evaluation of merit-based scholarships. The main problem with estimating the causal effect of such an intervention... 63ddb944fc

Cluster sampling Mullainathan In statistics, cluster sampling is a sampling plan used when mutually homogeneous yet internally heterogeneous groupings are evident in a statistical population. Bertrand, M. Duflo and S. J. , E. -S. Pischke (2009): Mostly Harmless Econometrics. An empiricist's companion. It is often used in marketing research. Princeton University Press, New Jersey 63ddb944fc

Local average treatment effect doi:10 In econometrics and related empirical fields, the

local average treatment effect (LATE), also known as the complier average causal effect (CACE), is the effect of a treatment for subjects who comply with the experimental treatment assigned to their sample group. Similar to the ATE, the LATE is calculated but does not include non-compliant parties. "Joshua D. The LATE can be estimated by a ratio of the estimated intent-to-treat effect and the estimated proportion of compliers, or alternatively through an instrumental variable estimator. Angrist and Jörn-Steffen Pischke (2009): Mostly Harmless Econometrics: An Empiricist's Companion". If the goal is to evaluate the effect of a treatment in ideal, compliant subjects, the LATE value will give a more precise estimate. Compliance refers to the human-subject response to a proposed experimental treatment condition. Statistical Papers. However, it may lack external validity by ignoring the effect of non-compliance that is likely to occur in the real-world deployment of a treatment method. 52 (2): 503–504. It is not to be confused with the average treatment effect (ATE), which includes compliers and non-compliers together 63ddb944fc

The most common form of regression analysis is linear regression, in which one finds the line (or a more complex linear combination) that most

closely fits the data according to a specific mathematical criterion. For example, the method of ordinary least squares computes the unique line (or hyperplane) that minimizes the sum of squared differences between the true data and that line (or hyperplane). For specific mathematical reasons (see linear regression), this allows the researcher to estimate the conditional expectation (or population average value) of the dependent variable when the independent variables take on a given set of values. Less common forms of regression use slightly different procedures to estimate alternative location parameters (e.g., quantile regression or Necessary Condition Analysis) or estimate the conditional expectation across... 63ddb944fc Acemoglu, D., & Pischke, J. S. (1998). Why do firms train? Theory and evidence. The Quarterly Journal of Economics, 113(1), 79–119. 63ddb944fc

Difference in differences Difference in differences (DID or DD) is a quasi-experimental statistical technique used in econometrics and quantitative research in the social sciences that attempts to mimic an experimental research design using observational study data by studying the differential effect of a treatment on a "treatment group" versus a "control group" in a natural experiment. e. (2008). g. e. D. Mostly Harmless

Econometrics: An Empiricist's Companion. Princeton University Press. , mean regression, reverse causality and omitted variable bias). pp. S. It calculates the effect of a treatment (i. Angrist, J. , a response variable or dependent variable) by comparing the average change over time in the outcome variable for the treatment group to the average change over time for the control group. Although it is intended to mitigate the effects of extraneous factors and selection bias, depending on how the treatment group is chosen, this method may still be subject to certain biases (e. ; Pischke, J. , an explanatory variable or an independent variable) on an outcome (i. S2CID 470667. 227–243 63ddb944fc

Homogeneity and heterogeneity (statistics) Mostly Harmless Econometrics: An Empiricist's In statistics, homogeneity and its opposite, heterogeneity, arise in describing the properties of a dataset, or several datasets. ; Pischke, Jörn-Steffen (2009-12-31). Econometric Methods. New York: McGraw-Hill. Angrist, Joshua D. 214–221. In meta-analysis, which combines data from any number of studies, homogeneity measures the differences or similarities between those studies' (see also study heterogeneity) estimates. They relate to the validity of the often convenient assumption that the statistical properties of any one part of an overall dataset

are the same as any other part. pp 63ddb944fc

The LATE was first introduced in the econometrics literature by Guido W. Imbens and Joshua D. Angrist in 1994, who shared one half of the 2021 Nobel Memorial Prize in... 63ddb944fc The existence of heteroscedasticity is a major concern in regression analysis and the analysis of variance, as it invalidates statistical tests of significance which assume that the modelling errors all have the same variance. While the ordinary least squares (OLS) estimator is still unbiased in the presence of heteroscedasticity, it is inefficient and inference based on the assumption of homoskedasticity is misleading. In that case, generalized least squares (GLS) was frequently used in the past. Nowadays, standard practice in econometrics is to include heteroskedasticity-consistent... 63ddb944fc Bakker, J.D., Maurer, S., Pischke, J.S., & Rauch, F. (2021). Of Mice and Merchants: Connectedness and the Location of Economic Activity in the Iron Age. Review of Economics and Statistics, 103(4), 652–665. 63ddb944fc Angrist, J. D., & Pischke, J. S. (2009). Mostly harmless econometrics: An empiricist's companion. Princeton University Press. 63ddb944fc Assuming a variable is homoscedastic when in reality it is heteroscedastic () results in unbiased but inefficient point estimates and in biased

estimates of standard errors, and may result in overestimating the goodness of fit as measured by the Pearson coefficient. 63ddb944fc

Matching (statistics) "Regression Meets Matching". e. 69–80. By matching treated units to similar non-treated units, matching enables a comparison of outcomes among treated and non-treated units to estimate the effect of the treatment reducing bias due to confounding. A simple, easy-to-understand, and statistically powerful method of matching is known as Coarsened Exact Matching or CEM. Jörn-Steffen (2009). Propensity score matching, an early matching technique, was developed as part of the Rubin causal model, but has been shown to increase model dependence, bias, inefficiency, and power and is no longer recommended compared to other matching methods. ISBN 978-0-691-12034-8 Matching is a statistical technique that evaluates the effect of a treatment by comparing the treated and the non-treated units in an observational study or quasi-experiment (i. when the treatment is not randomly assigned). The goal of matching is to reduce bias for the estimated treatment effect in an observational-data study, by finding, for every treated unit, one (or more) non-treated unit(s) with similar observable characteristics against which the covariates are balanced out (similar to

the K-nearest neighbors algorithm). Princeton University Press. pp. Mostly Harmless Econometrics: An Empiricist's Companion 63ddb944fc

== Examples == 63ddb944fc Matching has been promoted by Donald Rubin. It was prominently criticized in economics... 63ddb944fc == Example == 63ddb944fc

Regression discontinuity design By comparing observations lying closely on either side of the threshold, it is possible to estimate the average treatment effect in environments where random assignment to conditions is unfeasible. Mostly Harmless Econometrics: An Empiricist's Companion. True causal inference using RDDs is still impossible, because the RDD cannot account for the potentially confounding effects of other variables without randomization. pp. Little Jumpy: Regression Discontinuity Designs". Princeton University Press. 251–268. ISBN 978-0-691-12035-5 Regression discontinuity designs (RDD) are a quasi-experimental pretest–posttest design that attempts to determine the causal effects of interventions by assigning a cutoff or threshold above or below which an intervention is assigned 63ddb944fc

The RDD was originally applied by Donald

Thistlethwaite and Donald Campbell (1960) to evaluate the effect of scholarship programs on student career plans. The RDD is used in disciplines like psychology, economics, political science, epidemiology, and other related disciplines. Recent comparisons of randomised controlled trials (RCTs) and RDDs have empirically demonstrated the internal validity of the design. 63ddb944fc The population within a cluster should ideally be as heterogeneous as possible, but there should be homogeneity between clusters. Each cluster should be a small-scale representation of the total population. The clusters... 63ddb944fc

Homoscedasticity and heteroscedasticity The term originates from the Ancient Greek σκεδάννυμι skedánnymi, 'to scatter'. New York: McGraw-Hill. Mostly Harmless Econometrics: An Empiricist's In statistics, a sequence of random variables is homoscedastic () if all its random variables have the same finite variance; this is also known as homogeneity of variance. 214–221. The complementary notion is called heteroscedasticity, also known as heterogeneity of variance. Econometric Methods. ; Pischke, Jörn-Steffen (2009-12-31). Angrist, Joshua D. pp 63ddb944fc

The econometric approaches can be broadly

classified into nonstructural and structural. The nonstructural models are based primarily on statistics (although not necessarily on formal statistical models), their reliance on economics is limited (usually the economic models are used only to distinguish the inputs (observable "explanatory" or "exogenous" variables, sometimes designated as x) and outputs (observable "endogenous" variables, y). Nonstructural methods have a long history (cf. Ernst Engel, 1857). Structural models use mathematical equations derived from economic models and thus the statistical analysis can estimate also unobservable variables, like elasticity of demand. Structural models allow to perform calculations for the situations that are not covered in the data being analyzed, so called counterfactual analysis (for example, the analysis of a monopolistic market to accommodate a hypothetical case of the second entrant). 63ddb944fc In contrast to a time-series estimate of the treatment effect on subjects (which analyzes differences over time) or a cross-section estimate of the treatment effect (which measures the difference between treatment and control groups), the difference in differences uses... 63ddb944fc Angrist, J. D., & Pischke, J. S. (2014). Mastering 'metrics': The path from cause to effect. Princeton University Press. 63ddb944fc

Methodology of econometrics D. Angrist, J. (2009). -S. Mostly harmless econometrics: An empiricist's companion. , & Pischke, J. Hoover The methodology of econometrics is the study of the range of differing approaches to undertaking econometric analysis. Princeton: Princeton University Press. (2), 161–178 63ddb944fc

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