Introduction to Applied Statistics and Econometrics

In the vibrant field of Applied Statistics and Econometrics, the pursuit of understanding and interpreting the complexities of economic data plays a central role. This field equips students with the quantitative tools necessary for economic analysis, offering insights into decision-making processes that influence the economy at both macro and micro levels. For second-year bachelor students venturing into this discipline, three foundational pillars—sampling distributions, estimation, and hypothesis testing—serve as the bedrock of their econometric journey. Each chapter is designed to build upon students' knowledge, gradually advancing them through the intricacies of statistical inference and application in economic contexts.

Chapter One: Sampling Distributions

The journey begins with exploring sampling distributions, a concept pivotal to understanding how sample statistics provide insights into population parameters. This chapter aims to familiarize students with the theory of sampling and the distributions most commonly encountered in applied statistics, including the central limit theorem, which underscores the normal approximation of sample means. Grasping the behaviour of sampling distributions is crucial, as it lays the groundwork for subsequent inferential techniques. The primary objective here is to ensure students appreciate the significance of sample size, sampling methods, and their role in inferential statistics, forming a solid base for the practical application of econometric models.

Chapter Two: Estimation

Building on the understanding of sampling distributions, the second chapter transitions students into the realm of estimation. This segment focuses on estimating population parameters based on sample data, introducing concepts such as point estimates and confidence intervals, and distinguishing between biased and unbiased estimators. The essence of estimation lies in its ability to offer quantifiable measures of economic phenomena from sampled data, thereby enabling economists to make informed predictions and decisions. This chapter aims to equip students with the competency to construct and interpret confidence intervals, understand the properties of estimators, and apply these concepts to real-world economic data, enhancing their analytical prowess in econometric analysis.

Chapter Three: Hypothesis Testing

The third chapter introduces students to hypothesis testing, a statistical technique for testing population parameter assumptions. This chapter is dedicated to the logic and procedures behind hypothesis testing, including setting up null and alternative hypotheses, determining the appropriate test statistic, and making decisions based on p-values or critical values. Through hypothesis testing, students learn to assess the validity of economic theories and models against observed data, a skill essential for conducting empirical economics research. The objectives here are to foster critical thinking, enable students to carry out various statistical tests and interpret the results in the context of economic inquiries.

Objectives of Applied Statistics and Introduction to Econometrics

The overarching goal of this course is to arm students with a robust statistical toolkit essential for analyzing economic data and conducting empirical research. Students are prepared to tackle complex economic problems, derive empirical evidence, and contribute to informed policy-making by navigating through sampling distributions, estimation, and hypothesis testing. This course aims to enhance students' technical competence in statistical methods and cultivate a deeper appreciation for the role of data analysis in shaping economic insights and decisions. As students progress, they will find these tools invaluable for their further studies and future careers in the vast field of economics.