Regression Analysis With R and Easystats

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15/06/2023

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Preface

Acknowledgement

Part I.

BASICS OF ECONOMETRICS AND R

1. Introduction

Learning Objectives:
In this chapter, you will learn to

- *Importance of regression analysis in econometrics*

- *Overview of the book's structure and goals*

- *Introduction to R programming language and its relevance to econometric analysis*

This chapter introduces the basics of Econometrics and R to a novice user. Econometrics is a combination of two words: Econo + Metric. Econo refers to concepts of economics, while metric refers to measurement. Let's take an example of the law of demand from microeconomic theory. We know the demand of a commodity will decrease if the price of the commodity increases. But we don't know how much the demand will decrease, given the increase in the price is one unit (i.e., one Dollar, or one Euro, etc.). In Econometrics, we measure such increase or decrease using various experiments.

2. Introduction to Econometrics and Regression Analysis

Learning Objectives:
In this chapter, you will learn to

- *Understanding the basics of econometrics*
- *Role of regression analysis in econometric modeling*
- *Overview of the regression analysis process*
- *Introduction to R for econometric analysis*

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3. Getting Started with R for Econometrics

Learning Objectives:

In this chapter, you will learn to

- *Introduction to R programming language and its ecosystem*

- *Setting up the R environment and installing necessary packages*

- *Loading and manipulating data in R for econometric analysis*

- *Exploring data visualization techniques using R*

Part II.

ISSUES IN REGRESSION ANALYSIS

4. Simple Linear Regression

Learning Objectives:

In this chapter, you will learn to

- *Understanding the principles of simple linear regression*
- *Performing simple linear regression in R for econometric analysis*
- *Interpreting regression results in the context of economic variables*
- *Assessing model assumptions and addressing violations*
- *Practical examples and exercises using R*

- Understanding the principles of simple linear regression
- Performing simple linear regression in R for econometric analysis
- Interpreting regression results in the context of economic variables
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- Practical examples and exercises using R

5. Multiple Linear Regression

Learning Objectives:
In this chapter, you will learn to

- *Extending regression analysis to multiple independent variables*
- *Building and interpreting multiple linear regression models in R*
- *Handling multicollinearity and selecting significant predictors in an economic context*
- *Model evaluation and diagnostics in econometric regression*
- *Application of multiple linear regression in economic analysis using R*

- Extending regression analysis to multiple independent variables
- Building and interpreting multiple linear regression models in R
- Handling multicollinearity and selecting significant predictors in an economic context
- Model evaluation and diagnostics in econometric regression
- Application of multiple linear regression in economic analysis using R

6. Regression Analysis with Dummy Variables

Learning Objectives:
In this chapter, you will learn to

- *Incorporating categorical variables in regression analysis*
- *Creating and interpreting dummy variables in R*
- *Dummy variable pitfalls and remedies in econometric modeling*
- *Examples and case studies of dummy variable regression in economics using R*

- Incorporating categorical variables in regression analysis
- Creating and interpreting dummy variables in R
- Dummy variable pitfalls and remedies in econometric modeling
- Examples and case studies of dummy variable regression in economics using R

7. Heteroscedasticity and Robust Regression

Learning Objectives:
In this chapter, you will learn to

- *Understanding heteroscedasticity and its implications*
- *Addressing heteroscedasticity using robust regression techniques in R*
- *Interpreting robust regression results in an economic context*
- *Practical examples and exercises showcasing robust regression in econometrics*

- Understanding heteroscedasticity and its implications
- Addressing heteroscedasticity using robust regression techniques in R
- Interpreting robust regression results in an economic context
- Practical examples and exercises showcasing robust regression in econometrics

8. Time Series Regression

Learning Objectives:

In this chapter, you will learn to

- *Introduction to time series data in econometrics*
- *Time series regression models in R for economic analysis*
- *Dealing with autocorrelation and lagged variables*
- *Forecasting with time series regression models in R*
- *Applications of time series regression in economic forecasting*

- Introduction to time series data in econometrics
- Time series regression models in R for economic analysis
- Dealing with autocorrelation and lagged variables
- Forecasting with time series regression models in R
- Applications of time series regression in economic forecasting

9. Introduction to Logistic Regression

Learning Objectives:
In this chapter, you will learn to

- *Basics of logistic regression in econometrics*
- *Estimating logistic regression models in R*
- *Interpreting logistic regression coefficients and odds ratios*
- *Applications of logistic regression in economic research using R*

- Basics of logistic regression in econometrics
- Estimating logistic regression models in R
- Interpreting logistic regression coefficients and odds ratios
- Applications of logistic regression in economic research using R

10. Model Evaluation and Selection

Learning Objectives:
In this chapter, you will learn to

- *Evaluating model performance and goodness-of-fit measures in econometrics*
- *Validation techniques for econometric regression models*
- *Comparing and selecting models using information criteria*
- *Cross-validation and bootstrapping for robust model assessment in econometrics*

- Evaluating model performance and goodness-of-fit measures in econometrics
- Validation techniques for econometric regression models
- Comparing and selecting models using information criteria
- Cross-validation and bootstrapping for robust model assessment in econometrics

11. Practical Tips and Resources for Econometric Regression

Learning Objectives:
In this chapter, you will learn to

- *Data preparation and preprocessing tips for econometric analysis*
- *Handling missing data and outliers in regression analysis*
- *Dealing with endogeneity and instrumental variables*
- *Additional resources for further learning and practice in econometrics with R*

- Data preparation and preprocessing tips for econometric analysis
- Handling missing data and outliers in regression analysis
- Dealing with endogeneity and instrumental variables
- Additional resources for further learning and practice in econometrics with R

12. Conclusion

Learning Objectives:
In this chapter, you will learn to

- *Summary of the key concepts covered in the book*

- *Importance of regression analysis in econometrics and economic research*

- *Encouragement for further exploration and application of econometric regression using R*

- Summary of the key concepts covered in the book

- Importance of regression analysis in econometrics and economic research

- Encouragement for further exploration and application of econometric regression using R

Part III.

APPENDICES

Appendix A: R packages for econometric regression analysis and additional resources

Appendix B: Data sets used in the book's examples

Appendix C: R code snippets and tutorials for reference

The whole book is published on bookdown.org website. You can read the book online on this website. You can also download the source code of this book in multiple ways. The easiest way is to visit the website github, and Alternatively, you can download the entire source code of the book from github. Please run the following code to download the book:

```
1  #install.packages("devtools")
2  #devtools::install_github("bhattmaulik/RegressionAnalysis)
```