Department of Statistics

College of Administration and Economics

University of Salahaddin-Hawler

Subject: Econometrics

Course Book – 4th Year" Second Course"

Lecturer's name: Sami Ali Obed-(MSc)

Academic Year: 2023/2024

Course Book

1. Course name	**Econometrics**
2. Lecturer in charge	Sami A. Obed
3. Department/ College	Statistics and informatics/Administration and Economics
4. Contact	e-mail: sami.obed@su.edu.krd
5. Time (in hours) per week	Theory: 2 Practical: N/A
6. Office hours	Thursday: 8:30-10:30 &:11:30-1:30
7. Course code	
8. Teacher's academic profile	I graduated from Salahaddin University – Erbil in 2013 College of Administration & Economics \ Statistics and Informatics Department from 2013 to 2016 worked Assistant Researcher in the Statistics and Informatics Department. In 2019 I earned a master's degree in the Department of Statistics and Informatics College of Administration and Economics, University of Salahaddin. Now I am PhD student in Statistical Department. I have been teaching in the Statistics Department at Salahaddin University since 2020. I have taught (Principles of Statistics, Time Series, Multivariate, and Multivariate Analysis with SPSS, Econometrics), and doing research as well, and, I am working as a lecturer in the Statistics and Informatics Department – at Salahaddin University.
9. Keywords	Econometric, problems of Econometrics , resource of problems

10. Course overview:

Econometrics is a branch of economics that combines statistical methods with economic theory to quantify and test relationships between economic variables. The primary goal of econometrics is to provide empirical content to economic theories and to inform decision-making by analysing and interpreting data.

Econometric analysis often begins with an economic model, which is a simplified representation of economic relationships. These models help formulate hypotheses about how different variables are related.

In econometrics, variables are classified into two types: dependent and independent. The dependent variable is the outcome of interest, while independent variables are factors that are believed to influence the dependent variable.

Econometricians collect data on relevant economic variables. This data can be time-series data (collected over time) or cross-sectional data (collected at a specific point in time).

11. Course objective:

Econometrics aims to estimate and quantify the relationships between economic variables. This involves determining the strength and nature of associations between

dependent and independent variables

Econometrics provides a framework for testing and validating economic theories. By applying statistical methods to real-world data, economists can assess whether empirical evidence supports or contradicts theoretical predictions.

Econometric models are often used for forecasting future economic trends and outcomes. By understanding historical relationships between variables, economists can make informed predictions about future economic events.

12. Student's obligation

Students should be follow these requirements sin the class:
They have to come to the class on time.
They have to bring their lectures to the class every day.
If any student misses the quiz, he or she will get zero.
They have to bring their homework on time.

13. Forms of teaching

These lessons use several methods of teaching such as PowerPoint presentation to show the underline headings and using whiteboard as well. Sometimes, students will be asked to discuss and share their ideas on this field during the lecture with participating his/her classmates. From the beginning of the course, a handout of the lecture will be given to the students to see what they are studying during this course.

14. Assessment scheme

Midterm exam: 25% marks.
Class assignments & quizzes: there will be weekly class assignments and quizzes;15 % marks.
There will be extra assignments, which give the students extra marks.
Final exam: 60 % marks.
The examination schedule will be announced by the exam board of the Department of Statistics.

15. Student learning outcome:

- The definition of multicollinearity problem
- The Reasons or Sources of multicollinearity problem
- The definition of autocorrelation problem.
- The Reasons or Sources of Autocorrelation problem
- The consequences of autocorrelation problem.
- The definition of heteroscedasticity problem
- The Reasons or Sources of heteroscedasticity problem

16. Course Reading List and References:

Baltagi, B.H. and Baltagi, B.H., 2008. *Econometric analysis of panel data* (Vol. 4). Chichester: Wiley.

Panayotou, T. and Sungsuwan, S., 2023. An econometric analysis of the causes of tropical deforestation: the case of Northeast Thailand. In *The causes of tropical deforestation* (pp. 192-210). Routledge.

Tol, R.S., 2023. *Climate economics: economic analysis of climate, climate change and climate policy*. Edward Elgar Publishing.

17. The Topics:	Lecturer's name
Chapter One: 1- The definition of Multicollinearity problem. 2- The Reasons or Sources of Multicollinearity problem. 3- Methods for Detecting Multicollinearity problem. 4- The Consequences of Multicollinearity problem. 5- The Processing of Multicollinearity problem **Chapter Two:** 6- The definition of autocorrelation problem. 7- The Reasons or Sources of Autocorrelation problem. 8- Estimating and testing under the first order autoregressive process. 9- The consequences of autocorrelation problem. 10- The Processing of autocorrelation problem **Chapter Three:** 11- The definition of heteroscedasticity problem. 12- The Reasons or Sources of heteroscedasticity problem. 13- Test the heteroscedasticity problem. 14- The Consequences of heteroscedasticity problem. 15- The processing of heteroscedasticity problem.	Sami Ali Obed
18. Practical Topics (If there is any)	

19-

Q1// : From the following data for three explanatory variables, test multicollinearity problem between explanatory variables (X_1, X_2, X_3) under significant level ($\alpha = 0.05$), and using **Farrar – Glaubber test.**

$n = 11$, $\sum X_1 = 90$, $\sum X_2 = 41115$, $\sum X_3 = 36600$

$\sum X_1^2 = 395.21$, $\sum X_2^2 = 9{,}530{,}0{,}489$, $\sum X_3^2 = 8{,}2226{,}400$

$\sum X_1 X_2 = 14391509$, $\sum X_1 X_3 = 121426$, $\sum X_2 X_3 = 8{,}625{,}226{,}000$

$Tab\,t_{(0.025,\ 20)} = 2.086$, $Tab\,\chi^2_{(0.05,\ 3)} = 7.816$, $Tab\,F_{(0.05\ ,\ 2\ ,20)} = 3.49$

Q2// From the following data

X_t: 6.3 , 6 , 4.9 , 3 , 5 , 6.3 , 9.6 , 3.6 , 2.5 , 2.9 , 2.2 , 3.9 , 4.5 , 4.3 , 4

Y_t: 2.76 , 4.76 , 8.75 , 7.78 , 6.18 , 9.5 , 5.14 , 4.76 , 16.7 , 27.68 , 26.64 , 13.71 , 12.32 , 15.73 , 13.59

1) Estimate simple linear model.
2) Test the problem of Autocorrelation between

errors, if you know the tabulated value for (D.W)

under significant level 5% and degrees of freedom

(1,15) are: $d_L = 1.08$, $d_U = 1.38$

Q3// From the following data , test if there is heterogeneity problem between errors variances or not, using Goldfeld – Quandt test, if you know,

n = 10 , Tab F(0.05, 2, 2) = 19

X_i	39	43	21	64	57	47	28	75	34	52
Y_i	65	74	52	82	92	74	73	98	56	75

20. Extra notes:

The final exam will be determined by the exam board of the college.
Notice that, this syllabus may be subject to changes; we may take either longer or shorter time to finish them.

21. Peer review پێداچوونەوەی هاوەڵ