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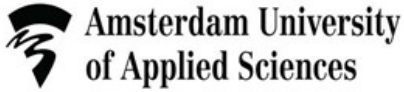
THE COURSE Econometrics OVERVIEW

Gavar State University

Khachatryan Hakob



BASIC INFORMATION

TITLE OF THE COURSE	ECONIMETRICS
TEACHERS	KHACHATRYAN HAKOB
YEAR OF THE COURSE	2019-2020, 2nd course MA
SEMESTER OF THE COURSE	Fall semester
LANGUAGE	Armenian
NUMBER OF ECTS CREDITS	3

LEARNING OUTCOMES ARE:

LO level		After completing this module, the students are able to:
1 Remembering	.	select necessary economic indicators for further analysis.
	.	define explained and explanatory variables.
	.	state the regression model between variables.
2 Understanding	.	Describe the correlation between the variables.
	.	Indicate and explain the coefficients of pair correlation between the dependent and independent variables.
	.	illustrate the coefficients of regression.
3 Applying	.	Calculate the dependent variable through the regression model
	.	Calculate the residuals of regression
4 Analyzing	.	Diagnose the presence of heteroscedacticy and multicolleniarity of regression model
5 Evaluating	.	Estimate the significance of the regression model
6 Creating	.	Develop the predicted values and forcastings

SYLLABUS OF THE COURSE

WEEK	TOPIC
1	The subject of Econometrics
2	Simple linear regression and correlation
3	ANOVA in regression analyses
4	Multiple linear regression analyses
5	Partial correlation
6	None linear regression
7	Regression models with dummy variables
8	Multicollinearity
9	Heteroscedasticy
10	Time series analyses
11	None stationary time series
12	Seasonal and periodic fluctuations in time series
13	Regression analyses for time series
14	Stationary time series analysis

WEEK 1 The subject of Econometrics.

- The origin of Econometrics. The specification of econometric models. The methods of econometric analyses. Endogenous and exogenous variables.

WEEK 2 Simple linear regression and correlation.

- Linear regression model for the case of one explanatory variable. Theoretical and selective regression. Economic interpretation of a random component. Regression linearity in variables and parameters. The task of evaluating the parameters. Least Squares Method (OLS). The system of normal equations and its solution. Properties of parameter estimates obtained by OLS. Geometric interpretation of the least squares method

WEEK 3 ANOVA in regression analyses

- Decomposition of the sum of the squares of the observed values of the dependent variable from its sample average. Analysis of variance. R square and its properties. R square to assess the quality of fitting regression in the absence of a free member.

WEEK 4 Multiple linear regression analyses

- Multiple linear regression in scalar and matrix forms. The least squares method. The system of normal equations. Covariance matrix of regression coefficient estimates. Unbiased estimate of the variance of a random term (without proof). Estimation of the covariance matrix of regression coefficient estimates. Gauss-Markov theorem for multiple linear regression.

WEEK 5 Partial correlation

- The meaning and essence of partial correlation. The properties of the coefficients of partial correlation. The coefficients of 1-st, 2-nd and k-th partial correlations

WEEK 6 None linear regression

- Functional transformations of variables in a linear regression model. Regression linear in the logarithms, as a model with constant elasticity. A model with constant growth rates (semi-logarithmic model).

WEEK 7 Regression models with dummy variables

- Use of quality explanatory variables. Dummy variables in multiple linear regression. The effect of choosing a base category on the interpretation of regression coefficients. Dummy variables for differentiating slope coefficients. Comparison of two regressions using dummy variables and the Chow test.

WEEK 8 Multicollinearity

- The essence of multicollinearity. The methods of testing of the presence of multicollinearity in multivariate analysis. Method of VIF and its application

WEEK 9 Heteroscedasticy

- The correlation between the residuals. The testing of the hypothesis of the presence of heteroscedasticity. Spearmen test, Goldfeld-Quandt test, White test, Glazer's.

WEEK 10 Time series analyses

- The type of time series. The main components of time series. The properties and characteristics of each components of time series.

WEEK 11 None stationary time series

- Time series with tendency. The modeling of the trends. The forecasts based on the extrapolation of the tendency of time series. The testing of presence of autocorrelation of the residuals. Durbin-Watson test.

WEEK 12 Seasonal and periodic fluctuations in time series

The modeling of seasonal time series with dummy variables. The modeling of additive and multiplicative models for seasonal time series with dummy variables.

WEEK 13 Regression analyses for time series

- The methods of elimination of the influence of tendency in time series. The models with first differences in the times series. Regression models including the time factor in time series.

WEEK 14 Stationary time series analysis

- Auto regression of time series (AR models).
- Moving average in time series (MA models). Auto regression moving average analyses
- (ARMA models). Auto regression integrated moving average analysis (ARIMA) models.

TEACHING METHODOLOGY

- Econometrics is one of the special courses for economists. This course should be thoroughly presented to students and must be explained its application during the professional activity.
- **During the lectures** the teaching materials are presented and explained with the help of PPT. All the contents of the course are uploaded on the University's site for students. Interactive methods of teaching are used also during the course.
- **During the practical lessons** the assignments are explained and instructed to the students. They must do econometric analysis based on the empirical data. After the completion the assignments each of them are presented by students and discussed during the lessons. The students express their opinions and justify their conclusions. The students are free for feedback with E-mail.
- Besides during the practical lessons the case studies will be organized either in microeconomics or macroeconomics. During the case studies related with microeconomics the data analysis will be based on the financial data of enterprises. During the case studies related with macroeconomics the data analysis will be based on official data of Statistic Committee of RA about public finance and banking system of country.

LABOUR MARKET RELEVANCE

- For economists the competitive features in the labor market are the availability of theoretical knowledge and the ability of its implication. Econometrics allows specialists to understand and to analyze the relationship between social-economic phenomena, to evaluate the causes and the consequences in micro and macro sphere of economy. Econometrics is one of the actual method for market analyses as well. Econometric models allow to disclose the regularity of the market factors. Finally, Econometrics allows to make forecasting with the defined confidence.
- Particularly the specialists of finance system will apply econometric methods for evaluating the risks in bank, for forecasting the exchange rates of currency and the expected inflation rate etc.

ASSESSMENT AND GRADING

- The grading is based on credit system. The studying process is divided in several parts which provides the final grade:
- Attendance - 10%,
- Activity - 50%,
- Final exam - 40%.

REFERENCES

- "Introdiction to econometrics" – Iames H. Stoch, Mork W.Watson, 2005, Pearson Edition
- Jeffrey M. Wooldridge, Introductory of Econometrics, second edition, South Western College pub, 2002
- Green William H. Econometric Analyses, Fifth edition 2000, Prentice Hall
- Walter Enders Applied Econometric Time Series, Second edition, Wiley, 2004
- "Introduction to econometrics" – Fifth Edition; Christopher Dougherty; April 2016
- Yeliseeva I.I.; Econometrics; textbook for Master's courses; 2014; M. Edition: YURAIT
- Yeliseeva I.I.; Econometrics:2008; M. YURAIT
- Vardanyan G.; The basic of econometrics; 2003; Yerevan, Edition: SARVARD
- Ghushyan L.; Elementary Econometrics; 2003, Yerevan, Edition: ZEST

COURSE ASSIGNMENT 1

- Please, through the regression analysis, study the influence of some principle factors on the long-term credits of commercial banks of RA in the period of recent 15 years. The exogenous variables should be selected by you (for example: the annual average interest rate, the volume of deposits of commercial banks of RA, the poverty rate of population of RA..). The source of date is the Statistic committee of RA (www.armstat.am). You can also use the data of individual commercial banks.

COURSE ASSIGNMENT 2/OR CASE STUDY DESCRIPTION

- Please, form the time series with macroeconomic or microeconomic indicators by years and by quarters. According the time series with annual data disclose the main tendency of this indicator and make confidence forecasting interval for upcoming two years. Please, analyse the time series of selected indicator for years by quarters. Analyse this time series as none-stationary series. Disclose the main seasonal components of time series. Build autoregressive models and calculate the coefficient of autocorrelation. The source of date is the Statistic committee of RA (www.armstat.am).

THANK FOR ATTENTION

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