

Ekonometria - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Ekonometria
Kod przedmiotu	11.9-WK-liEP-E-Ć-S14_pNadGenTMOKN
Wydział	Wydział Matematyki, Informatyki i Ekonometrii
Kierunek	Computer science and econometrics
Profil	ogólnoakademicki
Rodzaj studiów	pierwszego stopnia z tyt. licencjata
Semestr rozpoczęcia	semestr zimowy 2019/2020

Informacje o przedmiocie	
Semestr	5
Liczba punktów ECTS do zdobycia	4
Typ przedmiotu	obowiązkowy
Język nauczania	polski
Sylabus opracował	

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Ćwiczenia	15	1	-	-	Zaliczenie na ocenę
Laboratorium	15	1	-	-	Zaliczenie na ocenę
Wykład	30	2	-	-	Egzamin

Cel przedmiotu

The purpose of this course is to acquaint students with basics of construction and verification of statistical econometric models.

Wymagania wstępne

linear algebra, matematical analysis, probability theory and mathematical statistics.

Zakres tematyczny

Lecture:

1. Definition of econometric model. Clasification of econometric models. Classical linear model with many explanatory values and its matrix form. Estimation of structural parameters by the least squared method (LSM) (4 hours)
2. Properties of LSM estimator. The Gauss-Markov Theorem. (2 hours)
3. Properties of residuals of linear model. Distribution of total variety of explained value (2 hours)
4. The measures of fitting the model to the data: coefficient of determination and convergence. Unbiased estimator of the variance of the random component. Varianton coefficient. Unbiased estimator of the covariance matrix of the LSM estimator. Standard error of structural parameters in linear model (2 hours)
5. Interval estimation of parameters in the linear model with multiple explanatory values. Verification of hypothesis concerning linear combination of the structural parameters using t-test. (2 hours)
6. Test of model adequacy – Wald test. Definition of p-value. Statistical decision of rejection or acceptance of the hypothesis with application of mathematical packages. (2 hours)
7. Diagnostic verification of assumptions– selected tests of normality: Shapiro-Wilk and Jarque-Bera. (2 hours)
8. Autocorrelation of random element. The tests of Durbin-Watson and Breusch-Godfrey test. (2 hours)
9. Heteroscedasticity of random element. The tests of Goldfeld-Quandt, Breusch-Pagan and White. (2 hours)
10. Test of series. Point and interval forecast. (2 hours)
11. Selection of variables to the model. Graph method and Hellwig method. Stepwise regressions: forward and backwards. Methods of sequential choice with application of Akaike information criterion (AIC). (4 hours)
12. Generalized linear model. Linear models with respect to parameters. Nonlinear models. (4 hours)

Classes

1. Matrix form of linear model with one or more explanatory values. Estimation of parameters with application of the least squared methos LSM. Interpretation of results and methodical verification of the model. (2 hours)
2. Assessment of fitting the model to the data – selected measures of fitting. (2 hours)
3. Interval estimation of structural parameters of the model. Verification of statistical hypothesis concerning the parameters of the model. (2 hours)
4. Application of seleccted tests for verification of assumptions of the model. Point and interval forecast. (3 hours)
5. Selection of variables to the model. Graph method and Hellwig method.. (2 hours)
6. Estimation of parameters in the models reducible to the linear form. (2 hours)
7. Test (2 hours)

Laboratory

1. Correlation plot. Calculations and interpretation of sampling covariance and Pearson correlation coefficient. Estimation of parameters in linear model with a unique explanatory value (in particular with linear trend). (2 hours)
2. Linear model with multiple explanatory values. Matrix form and estimation of parameters using the least squared method. Computing of the theoretical values and the residuals. Mierniki dopasowania. (2 godz.)
3. Interval estimation of structural parameters of the model and the statistical significance. (2 hours)
4. Verification of assumptions in the model with application of selected tests. Forecasts. (4 hours)
5. Stepwise regression forward and backward. (1 hour)
6. Nonlinear models. (2 hours)
7. Test. (2 hours)

Metody kształcenia

One part of lecture is presented in the form of slides, and other in the traditional form (transformations of formulas, proofs of theorems and solutions of examples). At the classes one solves selected problems from lists. At the laboratory one solves selected problems with generated and real data with application of statistical packages (for example R-project, Gretl).

Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
Student knows selected statistical package.	• K_U33	• dyskusja • praca kontrolna • projekt • zaliczenie - ustne, opisowe, testowe i inne	• Laboratorium
Student can calculate and interpret the values of acquainted measures of fitting to the data.		• dyskusja • praca kontrolna • test końcowy • zaliczenie - ustne, opisowe, testowe i inne	• Wykład • Laboratorium • Ćwiczenia
Student can choose the right test for verification of assumption of the model.	• K_W04 • K_U16	• dyskusja • praca kontrolna • test • zaliczenie - ustne, opisowe, testowe i inne	• Wykład • Laboratorium • Ćwiczenia
Student is able to apply the positively verified model for making forecasts.	• K_W01 • K_U16 • K_K07	• dyskusja • praca kontrolna • test • zaliczenie - ustne, opisowe, testowe i inne	• Wykład • Laboratorium • Ćwiczenia
Student can perform the interpretation of estimations scope and make substantive verification of the model by checking whether the model is consistent with economical knowledge about studied phenomena.	• K_W02 • K_U02 • K_U15 • K_K07	• dyskusja • praca kontrolna • test • zaliczenie - ustne, opisowe, testowe i inne	• Wykład • Laboratorium • Ćwiczenia
Student can create econometric models and using the least squared method the student is able to compute estimators of structural parameters of the model.	• K_W03 • K_U02 • K_U07 • K_U12	• dyskusja • praca kontrolna • test • zaliczenie - ustne, opisowe, testowe i inne	• Wykład • Laboratorium • Ćwiczenia

Warunki zaliczenia

1. The verification whether the student is good prepared for the classes is held by checking the necessary knowledge (definitions, theorems, formulas) for solving tasks. During the laboratory the visual verification of correctness of the choice of the procedures on all computer stations. Sampling questions concerning the interpretation of the results obtained from applied procedures.
2. Tests with differential levels of difficulties.
3. Writing test verifying the knowledge of the content of the lecture.

The condition for taking the part in the exam is the positive mark from the classes, which one can obtain after reaching at least 50% of maximal scope in the writing test. The condition for obtaining the positive mark from the laboratory reaching at least 50% of maximal scope in the writing test. The condition for passing the course is a positive mark from the laboratory. The total mark of the course is the arithmetic mean of partial marks from classes, laboratory and the writing exam.

Literatura podstawowa

1. B. Borkowski, H. Dudek, W. Szczesny, Ekonometria. Wybrane zagadnienia, Wydawnictwo Naukowe PWN, Warszawa 2003.
2. J. Dziechciarz (red.), Ekonometria. Metody, przykłady i zadania, Wydawnictwo AE, Wrocław 2003.
3. M. Gruszczyński, T. Kuszewski, M. Pogórska, Ekonometria i badania operacyjne, Wydawnictwo Naukowe PWN, Warszawa 2007.
4. G. S. Maddala, Ekonometria, Wydawnictwo Naukowe PWN, Warszawa 2008.
5. A. Welfe, Ekonometria. Metody i ich zastosowanie, Polskie Wydawnictwo Ekonomiczne, Warszawa 1998.
6. A. Welfe (red.), Ekonometria. Zbiór zadań, Polskie Wydawnictwo Ekonomiczne, Warszawa 1997.

Literatura uzupełniająca

1. G. C. Chow, Ekonometria, PWN, Warszawa 1995.
2. C. R. Rao, Modele liniowe statystyki matematycznej, PWN, Warszawa 1982.

Uwagi

Zmodyfikowane przez dr Alina Szelecka (ostatnia modyfikacja: 21-11-2020 06:10)

Wygenerowano automatycznie z systemu SylabUZ