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ABSTRACTS

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Contents

Econometric Investigation of Unemployment in Azerbaijan's Labor Market 1

Input-Output Table with Pollutants Included 2

Demand Deficiency in G7 Countries 4

Panel Stationarity Tests with Cross-Section Dependence 5

Testing for Unit Roots in Panel Data with Smooth Structural Changes and Common Factors 6

Assessment of Knowledge-Based Economy 7

Short and Long Run Asymmetric Causality Analysis between Emissions and Foreign Direct Investments: Turkey Case 8

Spatial Econometric Analysis of Geographical, Financial and Commercial Contagion of the Global Crisis among Developed Countries 9

Does per capita Ecological Footprint Converge in N11 Countries? A Panel Data Analysis 10

The Relationship between Renewable Energy Consumption, Economic Growth and Ecological Footprint in MIST Countries: Evidence from Panel Causality Test 11

Is Unemployment Hysteresis Valid in E7 Countries? Fresh Evidences from Fourier Panel Unit Root Test 12

The Impact of Smoking Bans on Smoking Behaviour in Turkey: Dif-in-Dif Approach 13

Use of Trimean in Theil-Sen Regression Analysis 14

Spatial Econometric Analysis of Women Crime Distribution 15

Determination of Key Sector in Energy and Electricity Use by Input and Output Analysis: An Application on Turkish Economy 16

Tobacco Smoke Exposure among Women: The Case of Turkey 18

Does Regional Competitiveness Operational Programme Decrease the Unemployment Differences between Neighbours? An Empirical Assessment in the Black Sea Region of Turkey 19

Bayesian Estimation of the Tail Index from High Frequency Financial Data 20

Robust Outer Product of Gradients Tests for Spatial Dependence 21

Analysis of Koyck Model and Egg Production-Price Relationship 22

Analysis of Factors Determining the Financial Inclusion in Turkey 23

Convergence in Per-Capita GDP Across Turkish Provinces: 25

A Spatial Econometrics Approach 25

The Effects of Oil Prices on the Macroeconomic Variables and Energy Security of Oil Exporting Countries of the Caspian Sea: Panel Data Analysis 26

Intellectual Capital and Financial Performance: An Empirical Application on the Banking Sector of Turkey 27

Exchange Rate and Foreign Trade Relationship in Respect of Groups of Countries: The Case of Turkey (2003-2018) 28

Investigation of Factors Effecting Survival Time in Lung Cancer 29

The Relationship Between Real Exchange Rate-Foreign Trade in Turkey: The Marshall-Lerner Condition 31

Electricity Consumption and Urbanization in G-7 Countries: Panel Causality Analysis 32

Is the Labor Productivity in Turkey Procyclical? 34
Econometric Estimation of Ill-Posed Distributed Lag Regression Model 35
Efficiency Analysis in Healthcare Sector: The Case of Marmara Region 36
Volatility Spillover among the Istanbul Stock Exchange Share Market Sectors 37
Unit Root Tests Developed with Logistics Functions: An Application for Industrial Production Indices of Turkey and USA 38
The Asymmetric Effects of Exchange Rate on Current Account Balance in Turkey 39
The Interactions between Exchange Rate and Sectoral Stock Prices in Turkey: Volatility Spillover, Correlations and Hedging 41
The Effects of Commercial and Financial Globalization on Economic Growth in Turkey 42
An Asymmetric Nonlinear Cointegration Test based on Fourier Approximation 43
A Nonlinear Cointegration Test with Non-normal Errors 44
Contagion Effect and Interdependence of Foreign Exchange Markets: Wavelet Coherence Analysis 45
Econometric Analysis of the Key Factors of the Tourism Sector Development in the Republic of Azerbaijan 46
The Relationship Between Inflation and Interest Rate: Turkey Application 48
Fractional Unit Root Tests for Dependent Heterogeneous Panels 49
Testing Factor Augmented Fisher Effect 50
Is Trade Openness Impact on Health Level Rising? Evidence form Panel Data Across Upper-Middle Income Countries 51
Econometric Study of the Factors Influencing the Formation of Human Capital in the Republic of Azerbaijan 52
Panel Cointegration Relation Between High Technology Exports and Economic Growth in OECD Countries 53
Effects of United States of America and China on Bilateral Trade Relations of Developing Countries: An Investigation with Gravity Model and Panel Quantile Regression Estimators 55
The Effect of Global Volatility Shocks on the Risk of Equity Markets in Selected Emerging Economies* 56
The Adaptive Method for Econometric Modeling Time Series Forecasting 57
The Effect of Globalization on Economic Growth: An Econometric Analysis on France 59
The Gender Differences in Subjective Well-Being: The Case of Turkey 60
Determinants of the Subjective Well-Being and Health: Bivariate Ordered Probit Approach 61
A Broader Look at the Monetary Transmission Mechanism in Turkey 63
The Effect of Foreıgn Direct Investment-Unemployment-Employment: A Hidden Cointegration Analysis for BRIC-T Countries 64
Exchange Rate Pass-Through after 2008 Global Economic Crisis: The Case of Turkey 65
Relations Between CDS Spreads and Macroeconomic Variables: Dynamic Panel Data Analysis on BRICS Economies and Turkey 66
The Role of Institutions, Financial Structure and Banking Regulations on the Effectiveness of Macroprudential Policies 67

Network Analysis of Borsa Istanbul Companies 68
An Analysis of Mincer Earnings Equation between Genders in Turkey 69
Estimation of a Production Function with Restricted Penalized Estimators 70
Bayesian Analysis of Additive Factor Volatility Models with Heavy-Tailed Distributions with Specific Reference to S&P500 and SSEC Indices 72
The Factors Affecting Reasons for Divorce in Turkey: Multinomial Logit Model 74
An Analysis of the Pollution Haven Hypothesis in the Context of Turkey: A Nonlinear Approach 75
Implementing Nonlinear Unit Root Tests Based on Smooth Transition Autoregressive Models in R Software Environment 76
Gender Suicide Gap: Macroeconomic Factors, Socioeconomic Factors or Just Gender? 77
Forecasting Inflation in Turkey: The Role of Global Price Factors 78
The Impact of Migration Flows on Well-Being of Elderly Natives and Migrants: Evidence from the Survey of Health, Ageing and Retirement in Europe 79
Housing Bubble Research in Ankara Province with Right-Tailed ADF Tests 80
Regional Government Spending: A Spatial Panel Approach 81
Comparison of Estimation Performanies via Using OLS and Robust Estimators in Estimating ARDL Models 82
Investigation of the Efficiency of Public Hospitals by Considering Spatial Interaction 83
Factors Determining Consumer and Producer Confidence in Mediterranean Countries in Europe: Asymmetric Causality Analysis 84
Democracy and Economic Growth: An Econometric Analysis 86
The More the Technology, the Greater the Life Satisfaction or Vice Versa? 88
The Effect of Domestic Credits to Private Sector on Innovation: An Application on European Union Countries and Turkey 89
Investigation of Changes in Branch Banking in Turkey 91
Time-Varying Causality between Financial Development, Income and Trade Volume in Turkey 93
The Effect of Monetary Policy on Economic Growth in Azerbaijan 95
Happiness Inequality in Turkey: A Spatial Analysis 96
Empirical Analysis of the Relationship between Defense Expenditures and Economic Growth for Selected NATO Countries 97
An Empirical Study on Validity of Unemployment Hysteria Hypothesis in Turkey (1923-2019) 98
Analyzing Determinants of Dollarization in Turkey using a Nonlinear Distributed Lag Model 99
Culture and Life Satisfaction: Evidence from the 2013 Life Satisfaction Survey in Turkey 100
Econometrics Analysis of Information Technology Usage in Turkey between 2009-2018 Years 101
Turkish Exports after Liberalization Movements in 1980s: A Panel Gravity Model 102
A Performance Evaluation on Forecasting Methods for Turkish Real GDP Growth* 103
The Relationship between Inflation and Financial Development: Econometric Forecasts on High and Low Inflation Countries 105
Household Expenditure and Leisure Tourism: Evidence from Turkey 106

A Time Series Analysis of Unemployment Dynamics in Six Developed Countries: A New Approach 107

Child Vaccination and Healthcare Expenditure for OECD Countries: A Panel Cointegration Approach 108

Examination of the Relationship between Team Success and Market Value of Squad for Four Great Clubs in the Turkish Super League with Bootstrap Causality Analysis 110

Fisher's Effect Test for Emerging Market Economies 112

A Fourier Approach to the Relationship between Economic Growth and Renewable Energy Usage for "CHINDIA" 113

Are Suicide Cases in Turkey Explainable with Economic Parameters? 114

A New Asymmetric Unit Root Test with Smooth Transition and It's Application 115

The Estimation of Cross Sectionally Correlated Panel Data Models have Heterogeneous Structural Breaks 116

United States of America and China's Export Analysis: Autoregressive Panel Gravity Model 118

Modeling the Yield Curve of Turkish Sovereign Bonds 119

Analysis of Renewable Energy Consumption with Asymmetric Panel Data Models 120

Deposit Dollarization in Turkey: A Nonlinear Approach 122

International Trade, Intellectual Property Rights and Innovations: A Panel Data Analysis for Selected Developed and Developing Countries 123

The Asymmetric Effect of Real Exchange Rate on Non-Oil Export: The Case of Azerbaijan 125

Anomaly Detection in USD Exchange Rates and CPI in Turkey: Unsupervised Machine Learning and Predictive Methods 126

Investigation of Wage Differences in Manufacturing and Service Sectors by Quantile Regression in Turkey 127

Investigation Youth Unemployment in Turkey with Panel Logit Model 128

The Role of Social Capital in Environmental Protection Efforts: Evidence from Turkey 129

A Non-Parametric Approach: Penalized Spline Regression Model for the Inflation-Interest Cycle in Turkey 130

Determining the Relationship between Energy Spending and Household Characteristics in Turkey: An Application of Multivariate Heckman Sample Selection Model 131

Structural Breaks Unit Root Tests with Applications on Some Macroeconomic Variables 133

An Applied Research on Judgmental Extrapolation in Time Series 134

Energy Consumption and Growth Nexus in OPEC Countries: Panel Data Analysis 135

Forecasting of PM_{10} Concentrations and Air Pollution in Ankara: Time Series and Harmonic Regression Approach 136

Gender and Income Differences in Health 137

Network Analysis of Big Data Reduction Techniques 138

The Relationship Between Consumer Confidence Index and Some Macroeconomic Variables: An Asymmetry Analysis for Turkey 139

The Globalization of Inflation Hypothesis: The Case of Turkey 140

Oil Prices, Exchange Rate and Russian Economy 141

Economic Fluctuations in Turkey: FAVAR Approach 145
Provincial Governorship: Prolonging Office Years and Provincial Development 146
Infant and Child Mortality in Turkey: Count Data Analysis 147
The Contribution of Renewable Energy Sources to Economic Growth in Turkey 149
Evaluation of Renewable Energy Resources for TRA1 and TRA2 Regions 150
Applying Integrated Critic-Copras Model for Financial Performance Evaluation in Energy Sector 151
Investigating the Causes of Online Product Returns 152
Solution of Optimization Models with Dynamic Programming: Linear Programming, Integer Programming and Nonlinear Methods 153
Multi-Criteria Decision Making Techniques and Evaluation Criteria Used in the Evaluation of Renewable Energy Sources 155
Getting The Initial Solution with The GUROBI Solver 156
Optimal Site Selection for Unmanned Aerial Vehicles-UAV 157
Personnel Scheduling in A Hospital Emergency Department by Set Covering Approach 158
Full Consistency Method for Weighting Criteria Used in Sustainable Supplier Selection 159
Selection of Edge Banding Machine for Furniture Factory with CRITIC Based EWAMIX Method 160
Determination of Obesity in Turkey via Ordered Logit Random Effect Model 161
Green Growth: Assessment of OECD Countries' Performance 162
Dynamic Data Envelopment Analysis of Return Performance of BIST City Indices 163
Flowshop Scheduling Problem to Minimize Mean Completion Time with Uncertain Processing Times 164
No-Wait Flowshop Scheduling Problem to Minimize Total Tardiness subject to Total Completion Time 165
The Analysis of Cryptocurrency with Association Rules: A Research on Bitcoin 166
Comparison of GARCH-type Models and Artificial Neural Networks Performance in Oil Price Volatility 168
A model for Organizational Entrepreneurship Using System Dynamics (Case Study: Industrial Management Institute) 169
Demand Forrecastıng with Artificial Neural Networks Method and Implementation in the Shoe Industry 170
Investigation of Financial Performance of Tourism Enterprises in BIST Restaurants and Hotels Sector by MACBETH and EDAS Methods 171
Analysis of Stock Return with Markov Chains Models: An Application on Firm's Stock Return in BIST 30 172
The Determination of Public Healthcare Services Efficiency by Using WASPAS and Data Envelopment Analysis 173
Optimization of Nurse Scheduling Problem with Genetic Algorithms and an Application 174
Mathematical Model Proposal for Exam Scheduling Problem 175
Fuzzy Linear Programming Approach to Classification Problem 177
Data Text Mining in Web of Science 178

Information System Usage Effect on Decision Making: Example of an Energy Company 179
Analysis of Efficiency of Deposit Banks with DEMATEL and OCRA Methods 180
Framework Selection for Developing Optimization Algorithms: Assessing Preferences by Conjoint Analysis 181
Solution of Vehicle Routing Problem for a Ceramic Company by Ant Colony Optimization 183
Game Theory Approach to Stock Selection* 184
Supplier Selection Using Type-II Fuzzy TOPSIS Method in an Accommodation Company 185
Smart Agriculture with Autonomous Ground and Air Vehicles: An Application on to Harvest Optimization 186
Comparison of GARCH and Support Vector Regression Models in Volatility Estimation 188
Performance of Differential Evolution, Particle Swarm Optimization, Genetic Algorithm, and Artificial Bee Colony Algorithms in Clustering Analysis 189
Solar Power Plant Site Selection Method with ARAS: Turkey Application 190
Evaluation of Physical Workload Levels of Workers with Different Multi-Criteria Decision Making Methods 191
Analysis of GDP Contribution of Regions in Views of Employment Distribution to Sectors: An Application of Data Envelopment Analysis 192
Adaptive Neuro-Fuzzy Inference Sys tem for Prediction of Stress Level 193
Evaluation of Turkish Public and Private Hospitals with Models of DEA 194
Cargo company selection with Interval Type-2 Fuzzy AHP 195
Long-Term Prediction of the Relationship Between Inflation and Growth in G7 Countries with Markov Chain 196
0-1 Integer Programming Approach in the Solution of Academic Exam Scheduling Problems and an Application in FEAS 197
Incorporating the Robust Statistics and Scenario Analysis into the Portfolio Selection Problem 198
AHP-Based Methodology to Find the Weights of the Criteria for Online Shopping Website Selection 199
Hub Location Model with Entropy and MAUT Methods for PTT Cargo Delivery System 200
The Yacht Marinas' Economic Efficiencies in Turkey 201
Prioritization of Export Problems with DEMATEL Method: The Case of Aegean Region 202
An Application on Analysis of Confidence to Economy in Turkey* 203
Customer Service in Supply Chain Management: Field Study for Car Services in Ankara 205
Evaluation of G20 Member Countries in terms of Science and Technology Levels via Gray Relational Analysis Method 206
Determination of the Most Efficient Cement Producer of Turkey using Mixed Integer Linear Programming Model 207
Decision System for Skin Cancer Risk Assessment with Adaptive Network Based Fuzzy Inference 208
Clustering Human Development Index Performance for Provinces in Turkey 209
Examination of the Transfers in Export Shares of Public, Private and Foreign Caıital Types in Turkey 210

Evaluation of Problems in Dried Figs Manufacturing Process: A Case Study in Aydin Province.....211
Turkey's Energy Planning Weighted Grey Relational Method 212
Analysis of Total Factor Productivity of Real Estate Investment Trusts Indexed in Borsa Istanbul...213
Fuzzy Quality Control Graph Application in A Machinery Manufacturing Industry Company.....214
Evaluation of West Marmara Region Using ISO 37120 Standard's Energy Performance Indicator ..215
Evaluation of Online Game Criteria by DEMATEL Based Analytical Network Process (DANP) 216
Portfolio Optimization with Markowitz and Elton – Gruber Methods and Application to BIST 100 Index Data.....217
Cluster Analysis Based on Economic Freedom and Happiness Index for Countries 218
Analysis of Online Bookstores with Analytic Hierarchy Process 219
An Aggregated Measure Prioritizing Approach Proposal in Terms of Occupational Health and Safety 220
Electric and Gasoline Vehicle Routing Problem, Cost Optimization and Comparisons 221
A Conceptual Framework for a Healthcare Blockchain 222
Evaluation of the Location of the Regions (NUTS-1) in Terms of Health Services Using Various Health Indicators by TOPSIS and Grey Relational Analysis Methods.....223
Relationship Between MCDM Methods in the Case of Weighting Criteria with Entropy Method: An Application on G-20 Countries.....224
Markov Chain Analysis of a Power Plant Availability.....225
Performance Evaluation of METU Technopolis Companies with Data Envelopment Analysis.....226
Forecasting Forex Rates with Artificial Neural Networks (Vector Machine Support).....227
The Combination of Generalized Linear Model and Gauss Copula: An Application Study in R 229
Projection of Sectoral CO2 Emission Values with Input-Output Models in the Framework of 11th Development Plan.....230
Differentiation of Erythemato-Squamous Diseases with Support Vector Machines and Comparison of Kernel Functions.....231
Computer Aided Author Recognition Application in Text Mining.....233
A Review on Forecasting Turkey's Export Values by Using Artificial Neural Network* 234
A Review on Forecasting Turkey's GDP Value by Using Artificial Neural Networks* 235
Classical and Bayesian Estimation of Reliability in Multicomponent Stress-Strength Model for Exponentiated Pareto Distribution.....236
Determination of Factors Affecting Football Winning with Ordinal Logistic Regression Model: The Case of 2018 World Cup.....237
An Investigation of Factors Affecting the Frequency of Helping Beggars: The Case of Erzurum Province 238
An Investigation of the Impact of Social Media on Our Daily Lives: Erzurum Case 240
Clustering Countries Considering Child Mortality by K-Means.....242
Mixture Regression Modeling based on the Shape Mixtures of Skew Laplace Normal Distribution .243
Confidence Intervals based on Absolute Deviation for Population Mean of a Positively Skewed Distribution 244

An Application of Data Envelopment Analysis Over Medium Sized Banks in Turkish Banking Sector 245

On the Predictive Performance of Distributed Lag Model 246

Bi-Variate Model for Financial Time Series Forecasting with Convolutional Neural Network 247

Fuzzy Inference System for Time Series Prediction based on Deep Neural Network 248

Clustering Method by Copulas: Selection of Variables to Predict Mortality Risk 249

Investigation of Movements in Inter-World Stock Exchange through Social Network Analysis 250

Linear Regression Approach to Variance Analysis (ANOVA) Using Cholesky Decomposition Method and Excel Application 251

An Application about Determination of Model Parameters via Genetic Algorithm in Elastic Net Regression Analysis 252

Investigation of Attitudes Towards Syrian Immıgrate to Turkey by Proposed Structural Equation Model 254

Time Series Prediction with Dendritic Neuron Model Artificial Neural Network 255

Statistical Analysis of Insurance Problems 256

The Modeling of Firm Based Carbon Footprint for Green Supply Chain Management and Automated with Power BI 257

Outsourcing and Innovation Relationship of Fortune 500 Turkey Enterprises 258

In Different Exchanges, The Usability of the Nonlinear Neural Network for the Portfolio Optimization Method 259

Examination of Countries in terms of Sustainable Development Goals 260

Analysis of Unemployment Hysteresis Hypothesis in Turkey Using Structural Breaks Unit Root Tests 261

Forecasting Additional Warranty Purchasing by Using Machine Learning Methods 262

The Effect of Academic and Administrative Staff's Awareness about Enterprise Integration on Enterprise Integration Level in Higher Education Institutions in Turkey 263

Convergence Analysis of Health in The G7 Countries: Panel Unit Root Test 265

Intuitionistic Fuzzy Approach for Sustainable Supplier Selection based on Economic Indicators 266

Estimation of the Affecting of Gold Prices in Turkey based on Artificial Neural Networks and Fuzzy Logic 268

Forecasting of Pension Mutual Funds by Artificial Neural Networks 269

Comparison of Fuzzy K-Means and Fuzzy K-Medoid Methods: An Application on Clustering of Provinces According to Information and Communication Technologies 270

Image Classification Using Deep Learning Algorithms 272

Forecasting the Economic Crisis Period with Logistics Regression Analysis Based on the Trading Volumes of Companıes in Istanbul Stock Exchange 273

Comparison of Hsieh Test and ANOVA for Log-transformed on Income Data 274

Time Series Forecasting using ATA Method and Some Special Combination Methods on M4-Competition Financial and Economic Data Sets 275

An Application for Determining the Preferences of Working Conditions of College Teenagers with Conjoint Analysis 276

Determination of Wind Speed Characteristics using Mixture Distributions 277

Entropy Estimation of the Multiply Type II Censored Rayleigh Competing Risks Data 278

Optimization of Portfolio Based on Genetic Algorithm Method Using Treynor Index 279

Classification of Provinces in Turkey by Cultural Structure Fuzzy Clustering Analysis Approach Based on Factor Analysis 280

Liu Estimation for Tobit Regression Model 281

Predicting Sectors of Investments in Startup Companies by Artificial Neural Networks and Logistic Regression Analysis 282

Large and Small Sampling Properties of Shannon, Rényi and Tsallis Entropies: A Simulation Study 284

Measurement of The Efficiency of Portfolio Obtained by Particle Swarm Optimization Algorithm: An Application of Data Envelopment Analysis 285

Relationship Between Consumer Confidence Index and Some Macroeconomic Indicators 286

Inference for Progressive Type-II Censored Data from the The Power Lindley Distribution Under a Step-Stress Partially Accelerated Life Test 287

Social Media Sentiment Analysis on 2020 United States Presidential Election 288

Predicting the Financial Performance of Transportation Companies Listed in BIST Via Machine Learning Algorithms 289

Independent Component Analysis Approach for Monitoring Multivariate Process Control 290

Examining the Relationship between Instagram Addiction and Its Antecedents Using Structural Equation Modeling Approach: A Study among Undergraduate Students 291

Statistical Process Control in Zero Inflated Poisson Processes 292

Quality Control Charts Based on Inverse Weibull Distribution 293

Testing Environmental Kuznets Curve Hypothesis by Various Mutual Information Measures based on Normal Quantile Transformations 294

Investigation of Pesticide Use in Turkey and Creating Environmental Awareness 295

Genetic Algorithm for Parameter Estimation in Double Seasonal Holt Winters Exponential Smoothing 296

Circular-Linear Ridge Regression Analysis 297

Comparison of Least Squares Ratio Estimators with L1 and L2 Estimators 299

A New Robust and Biased Estimator in Linear Regression Model 300

Text Mining Based Request Management 301

Evaluation of Countries According to PISA Education Data 302

Investigation of Seasonal Income Convergence Hypothesis for Turkey with Bridge Estimator 303

A Bootstrap Approach to the Discriminant Analysis in the Classification of Countries Based on Their Development Level 305

The Relationship Between Health and Research and Development Indicators: A Study on Turkey and EU Countries 306

Analysis of the Relationship Between Anthropometric Measurements and Academic Performance of Students in Technical Drawing Course 307

A Classification on Pisa 2015 Results with Support Vector Machines 308

Comparative Evaluation of Variables Affecting Local Election Results through Classification Trees 309
Evaluation of the Score Test Results with the Prediction of Conversion to Alzheimer's Disease 310
The shift-ridge and Shift-lasso Methods 311
Factors Affecting the Late Marriage: The Gender Perspective 312
Structural Equation Modeling with Regression Analysis: A Comparative Analysis Sample for Public Servants 314
Measuring the Perception Towards Corporate Image in Local Governments by Correspondence Analysis 315
Why Adjusted Box-Plot? 316
A New Test Based on Parametric Bootstrap Method for Testing the Homogeneity of Variances 318
Big Data Visualization and House Preference Infographics 319
Statistical Investigation of Calf Losses 320
One-Sided Median Quality Control Charts for Monitoring Changes in Process Mean 321
Development of Scale of Satisfaction in Justice Services 322
Analysis of the Relationship between Work Capital and Company Profitability with Panel Data: An Application on Production Companies (2009-2018) Registered in BIST 323
The Examination of Asymmetric Dependence by Using Copula Modeling 324
The Bivariate Risk Premium Based on Utility Copula for Dependent Risks 325
Estimation of Damage Reserves in Insurance Companies with Generalized Linear Models 326
Modelling of Turkish Electricity Consumption using Genetic Algorithm and ANFIS 327
The DEA Game Cross Efficiency Method and an Application 328
Determinants of Coffee Consumption in Coffee Houses: The Case of Adana 329
Analysing the Relationship between the Mother's Working Condition and Child Development using Correspondence Analysis 330
Econometric Modelling of Electricity Generation of Wind Turbines in Turkey and Investigation of Compliance with Wind Turbine Power Curve (WTPC) 331
Capacity Reservation Optimization 332

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Clustering Countries Considering Child Mortality by K-Means

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Abstract

In the present study, firstly, it is aimed to determine how the countries are clustered by using causes of child deaths in 2017. Then, it is aimed to examine the changes in clusters formed using 2017 data compared to 2000. The data used in the study was provided through UNICEF. In total, data from 193 countries covering the years 2000 and 2017 were reached. The data set includes percentages of AIDS, congenital, diarrhea, injury, intrapartum, malaria, measles, meningitis, pneumonia, preterm, sepsis, tetanus and other diseases caused deaths of children under 5 years of age. For the clustering of countries, k-means method, which is one of the non-hierarchical clustering methods, was used and elbow method was used to determine the number of clusters. Data were analyzed using R program.

According to the information obtained from the elbow method, countries were divided into 8 clusters based on child deaths in 2017. The numbers of countries in the clusters are as follows; 19, 5, 11, 4, 56, 53, 26, 19. The mortality rate, one of the important indicators of public health, is used by the United Nations as a criterion in the "Human Development Index (HDI)". In this respect, the clusters obtained as a result of the analyzes were examined by considering the human development levels of the countries in each cluster. The average Human Development Index of the countries in the clusters was calculated as 0.84, 0.57, 0.58, 0.77, 0.62, 0.79, 0.88 and 0.47, respectively. In Cluster 1 and Cluster 5, preterm is the most common cause of death. In Cluster 2 measles, in Cluster 3 and Cluster 8 other causes, and in Cluster 4 intrapartum diseases caused the highest number of child deaths. In Cluster 6 and Cluster 7, in which Turkey takes part, congenital disease causes the highest death. In cluster 7, deaths due to congenital disease decreased, while in all the other clusters the percentage of deaths caused by this disease increased. In Cluster 7, in which Turkey takes part, while percentage of child deaths caused by congenital diseases, injuries, intrapartum diseases, meningitis and preterm decreased, percentage of child deaths caused by sepsis and other diseases increased. In Cluster 8, the most common diseases that cause child mortality are pneumonia, malaria, preterm and intrapartum diseases.

In this study, countries were grouped according to various causes of death in children under 5 years of age. As a result of the K-means method, a total of 8 clusters were formed. The clusters were examined by considering the human development levels of the countries in each cluster. Preterm is one of the major causes of child deaths in countries. In general, the most important causes of child deaths in countries with high human development level are congenital diseases and preterm. In countries with low human development, the most important causes of child deaths are pneumonia and intrapartum.

Keywords: *Causes of Child Death, Human Development, Clustering Analysis*

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