University of Dundee

Worst-Practice Benchmarking with Inverted VEA

Karagiannis, Giannis; Kourtzidis, Stavros; Ravanos, Panagiotis

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Contents

Welcome to vNAPW XI!

Dear Colleagues,

Welcome the the 11th (virtual) North American Productivity Workshop, hosted by the Miami Herbert Business School at the University of Miami.

vNAPW XI will span five days. Wednesday, June 10th is the Young Researchers' Workshop, providing an excellent opportunity for the rising stars in our field the opportunity to present their work to a dedicated audience and receive feedback from renowned scholars in the field. The four main days of the conference cover Monday, June 8th, Tuesday June 9th, Thursday June 11th and Friday June 12th. We have a total of 15 parallel sessions along with six keynote speeches.

Each day of the conference will have a keynote speech with two during the Young Researchers Workshop. These keynote speeches will be given by Leopold Simar (Université Catholique de Louvain), Camilla Mastromarco (University of Salento), Valentin Zelenyuk (University of Queensland), Subal Kumbhakar (SUNY Binghamton), Robin Sickles (Rice University) and Kristiaan Kerstens (CNRS-LEM, IESEG School of Management)

All of us on the local organizing and scientific committees welcome you to vNAPW XI.

Christopher F. Parmeter

COMMITTEES

Local Organizing Committee, Miami Business School, University of Miami

Christopher F. Parmeter and Ian Wright

Scientific Committee

Jaap Bos	Maastricht University	The Netherlands
William C. Horrace	Syracuse University	USA
Subal Kumbhakar	Binghamton University	USA
Camilla Mastromarco	University of Salento	Italy
Alfons Oude Lansink	Wageningen University	The Netherlands
Christopher F. Parmeter	University of Miami	USA
Spiro Stefanou	University of Florida	USA
Valentin Zelenyuk	University of Queensland	Australia

Conference Mechanics

Sessions

- All sessions will be hosted on Zoom. They will be recorded and hosted remotely on the NAPW XI webpage. Only those who have registered will have access to view the sessions remotely.
- The majority of sessions contain three papers. Each session is scheduled to run for 75 minutes with each paper being allotted 20 minutes with a five minute Q&A afterwards. Sessions chairs are expected to host the session and take care of "logistics" for all of the speakers of the session.
- Each session will have a unique web address that is open through the date of the actual session. This means that presenters can log in ahead of time and practice their talks. Additionally it is recommended that presenters log into their session 30 minutes prior to the start of the session to ensure that everything is working properly, microphone and video camera and accessible, etc.
- In the case a presenter is not present in the parallel session, the session will continue and finish early. In this setting the chair can give more time to each paper at his or her discretion.
- All times listed are Eastern Time Zone. Please be aware of this when making plans for your presentation or for those presentations you wish to attend live. Remember, if for any reason you miss a presentation, they will be available to watch on the NAPW XI webpage for several weeks after the conference closes.
- The presenter for each paper is marked with an $*$.

Conference Program at a Glance

Monday June 8th
8:45-9:00am	Opening Remarks
9:00-9:45am	Keynote I (Leopold Simar)
10:15-11:30am	Parallel Session I
12:00-1:15pm	Parallel Session II
1:45-3:00pm	Parallel Session III
3:30-4:45pm	Parallel Session IV

Tuesday June 9th
9:00-10:15am	Parallel Session I
10:45am-12:00pm	Parallel Session II
12:30-1:15pm	Keynote II (Kristiaan Kerstens)
1:45-3:00pm	Parallel Session III
3:30-4:45pm	Parallel Session IV

Wednesday June 10th, Young Researchers' Workshop
8:50-9:00am	Opening Remarks
9:00-9:45am	Keynote III (Robin Sickles)
10:15-11:45pm	Session I
12:15-1:45pm	Session II
2:15-3:00pm	Keynote IV (Subal Kumbhakar)
3:30-5:00pm	Session III

Thursday June 11th
9:00-9:45am	Keynote V (Valentin Zelenyuk)
10:15-11:30am	Parallel Session I
12:00-1:15pm	Parallel Session II
1:45-3:00pm	Parallel Session III

Friday June 12th
1:00-2:15am	Parallel Session I
9:00-10:15am	Parallel Session II
11:00-11:45am	Keynote VI (Camilla Mastromarco)
12:15-1:30pm	Parallel Session III
2:00-3:15pm	Parallel Session IV
3:30-3:45pm	Closing Remarks

<center>SESSION SCHEDULES</center>

Monday June 8th.

8:45am-9:00am: Welcome and Opening Remarks

9:00am-9:45am: Keynote Lecture I
Chair: Paul Wilson

Identification in Models of Efficiency, Leopold Simar

10:15am-11:30am: Parallel Sessions I

SFA I
Chair: Alecos Papadopoulos

Semiparametric Estimation of Spatial Autoregressive Smooth-Coefficient Panel Stochastic Frontier Models, Kien C. Tran (University of Lethbridge)*; Artem Prokhorov (University of Sydney); Mike G. Tsionas (Lancaster University Management School)

The "Wrong Skew Problem" in Stochastic Frontier Analysis: A Review and Some New Approaches, Alecos Papadopoulos (Athens University of Economics and Business)*; Christopher Parmeter (University of Miami)

Semiparametric Penalized Likelihood Approach to Stochastic Frontier Analysis, Carlos F Valencia (University of Los Andes)*

Education I
Chair: Alice Bertoletti

The Determinants of University-Industry Collaboration: An Analysis of UK Higher Education Institutions, Alice Bertoletti (Politecnico di Milano)*

Education and Regional Income Disparities in Brazil: A Stochastic Frontier Approach, Jorge O. Pires (FGV - Sao Paulo School of Economics)*; Fernando Garcia (Ex Ante Consulting); Ana Magnabosco (Ex Ante Consulting)

Using Metafrontier Methods to Estimate the Effects of Instruction Time on School Efficiency, Giovanna D'Inverno (KU Leuven); Chris O'Donnell (University of Queensland)*

A Longitudinal Analysis of European Countries' Education Systems in the Light of Europe 2020 Strategy, Audrone Jakaitiene (Vilnius University)*; Ana Camanho (University of Porto); Flavia Barbosa (University of Porto); Dovile Stumbriene (Vilnius University)

12:00pm-1:15pm: Parallel Sessions II

DEA I
Chair: Juan Aparicio

Hypothesis Testing in Nonparametric Models of Production using Multiple Sample Splits, Leopold Simar (Universite Catholique de Louvain); Paul W. Wilson (Clemson University)*

Efficiency Analysis Trees, Miriam Esteve (Universidad Miguel Hernández de Elche); Juan Aparicio (Universidad Miguel Hernández de Elche)*; Alex Rabasa (University Miguel Hernandez); Jesus J. Rodriguez-Sala (Universidad Miguel Hernández de Elche)

Permutation Tests to Check Assumptions in DEA as Well as Perform Second Stage Analysis, Mette Asmild (University of Copenhagen)*; Dorte Kronborg (CBS); Anders Rønn Nielsen (CBS)

Firm Productivity
Chair: David Rivers

Firm Productivity and Labor Quality, Mons Chan (University of Toronto)*; Sergio Salgado (The Wharton School – University of Pennsylvania); Ming Xu (Queen's University)

Intangibles within Firm Boundaries, Angelos Theodorakopoulos (KU Leuven)*

Prices, Profits, Proxies, and Production, Victor H. Aguiar (The University of Western Ontario); Roy Allen (The University of Western Ontario); Nail Kashaev (The University of Western Ontario)*

1:45pm-3:00pm: Parallel Sessions III

SFA II
Chair: Samuele Centorrino

Maximum Likelihood Estimation of Stochastic Frontier Models with Endogeneity, Samuele Centorrino (Stony Brook University)*; Maria Perez-Urdiales (Stony Brook University)

Managing Power Interruptions: A Bottom-Up Spatial Frontier Model with an Application to a Spanish Electricity Network, Luis Orea (University of Oviedo)*; Pablo Argüelles (EDP)

Policy Evaluation in Panel Data Stochastic Frontier Models: A Regression Discontinuity Approach, Oleg Badunenko (Brunel University London); Giovanna D'Inverno (KU Leuven)*; Kristof De Witte (KU Leuven)

Banking
Chair: Shirong Zhao

Evidence from Shadow Price of Equity on "Too-Big-to-Fail" Banks, Shirong Zhao (Clemson University)*

Multidirectional Conditional Convergence in European Banking, Panagiotis Tziogkidis* (University of Plymouth); Dionisis Philippas (ESSCA School of Management); Mike G. Tsionas (Lancaster University)

3:30pm-4:45pm: Parallel Sessions IV

Productivity Spillovers I
Chair: Karligash Glass

Does Spillover Stimulate Productivity? A Firm-Level Analysis, Shunan Zhao (Oakland University)*; Man Jin (Oakland University); Subal Kumbhakar (SUNY Binghamton)

Uncovering Spatial Productivity Centers using Asymmetric Bidirectional Spillovers, Anthony J. Glass (University of Sheffield); Karligash Glass (Loughborough University)*

The Productivity Effects of Supplier, Buyer and Competitor Driven ICT Spillovers, Dolores Añon Higon (Universitat de Valéncia)*; Jaime Gómez (Universidad de la Rioja); Pilar Vargas (Universidad de la Rioja)

Applications I
Chair: Gerald Granderson

A Geometric Young Productivity Index for Indian Manufacturing, Subhash C Ray (University of Connecticut); Kankana Mukherjee (Babson College)*; Arnab Deb (International Management Institute)

The Role of Poverty Measures in Achieving Equity of Student Outcomes in Texas, Shawna Grosskopf (Oregon State); Kathy Hayes (Southern Methodist University)*; Laura Razzolini (The University of Alabama); Lori Taylor (Texas A&M University)

Effects of Repealing Certificate of Need Regulation on Total Factor Productivity Growth, Gerald Granderson (Miami University)*

Tuesday June 9th.

9:00am-10:15am: Parallel Sessions I

DEA II
Chair: Cinzia Daraio

Direct Estimation of Marginal Rates in Nonparametric Models with Undesirable Outputs, Victor Podinovski (Loughborough University)*

Testing Restrictions in Nonparametric Frontier Models, Cinzia Daraio (Sapienza University of Rome)*; Leopold Simar (Universite Catholique de Louvain); Paul W. Wilson (Clemson University)

Confidence Intervals for the Efficiency Scores in Non-Convex Technologies, Luiza Badin (Bucharest University of Economic Studies)*; Valentin Patilea (ENSAI); Leopold Simar (Universite Catholique de Louvain)

DEA in Heterogeneous Production Possibility Sets: A Comprehensive Reality Check, Taylan G. Topçu (Virginia Tech)*; Ning-Yuan Liu (Virginia Tech); Konstantinos Triantis (Virginia Tech); Bart Roets (INFRABEL); William Seaver (University of Tennessee at Knoxville); Cinzia Daraio (Sapienza University of Rome)

Livestock
Chair: Loren Tauer

Structural Change and Environmental Efficiency in the US Dairy Sector, Robert Mosheim (ERS-USDA)*

Evaluation of Holstein Bull Semen Prices with the Two-Tier Efficiency Model, Loren Tauer (Cornell University)*

Animal Welfare and Productive Efficiency in Intensive Pig Fattening, Stefan Seifert (University of Bonn)*; Reinhard Uehleke (University of Bonn); Silke Hüttel (University of Bonn)

10:45am-12:00pm: Parallel Sessions II

Education II
Chair: Tommaso Agasisti

Evaluating the Higher Education Productivity of Chinese and European "Elite" Universities Using a Meta-Frontier Approach, Tommaso Agasisti (Politecnico di Milano School of Management)*

Intertemporal Causal Non-Parametric Frontiers and The Cost of Funding and Not Funding Schools, Anna Mergoni (KU Leuven)*; Kristof De Witte (KU Leuven)

Incorporating Percentages in the Assessment of School Efficiency: An Empirical Study, Junlin Wu (Loughborough University)*; Nikos Argyris (Loughborough University); Victor Podinovski (Loughborough University)

12:30pm-1:15pm: Keynote Lecture II
Chair: Konstantinos Triantis

Short-Run Johansen Frontier-Based Industry Models: Methodological Refinements and Empirical Illustration on Fisheries, Kristiaan Kerstens

1:45pm-3:00pm: Parallel Sessions III

Methods I
Chair: Maria Perez-Urdiales

Binary Endogenous Treatment in Stochastic Frontier Models with an Application to Soil Conservation in El Salvador, Samuele Centorrino (Stony Brook University); Maria Perez-Urdiales (Stony Brook University)*; Boris Bravo-Ureta (University of Connecticut and University of Talca); Alan Wall (University of Oviedo)

When Treatment Meets Learning: Learning-By-Being-Treated and its Impact on Average Treatment Effects, Jaap Bos (Maastricht University)*

A Flexible Approach to Estimate Total Factor Productivity Change and its Components, Gudbrand Lien (Inland Norway University of Applied Science, Lillehammer)*; Subal Kumbhakar (SUNY Binghamton)

Environment I
Chair: Carl Pasurka

Climate Variables and the Technical Efficiency of Water and Sewer Treatment Companies in Brazil: A Stochastic Frontier Analysis Between 1995 and 2016, André Danelon (University of Sao Paulo)*; Humberto Spolador (University of Sao Paulo); Subal Kumbhakar (SUNY Binghamton)

Green Innovation and Patenting Renewable Energy Technologies in OECD, Esfandiar Maasoumi (Emory University); Almas Heshmati (Jönköping University)*

Stated and Revealed Pollution Abatement Costs Revisited, Rolf Färe (Oregon State University); Shawna Grosskopf (Oregon State University); Carl Pasurka (U.S. Environmental

Protection Agency)*

3:30pm-4:45pm: Parallel Sessions IV

Quantile Methods
Chair: Ian A. Wright

More Efficient Nonparametric Estimation of Monotonic and Concave Quantile Regression Functions, Timo Kuosmanen (Aalto University School of Business); Sheng Dai (Aalto University School of Business)*; Xun Zhou (Aalto University School of Business)

Bayesian Quantile Estimation of the Stochastic Frontier Model, David H. Bernstein (University of Miami)*; Christopher Parmeter (University of Miami); Mike Tsionas (Lancaster University Management School)

On Quantile Estimation of the Stochastic Frontier Model, William Horrace (Syracuse University); Christopher Parmeter (University of Miami); Ian A. Wright (University of Miami)*

Agriculture I
Chair: Eric Njuki

Productivity Growth, Cost Efficiency and the Changing Structure in the U.S. Dairy Sector, Eric Njuki (Economic Research Service - USDA)*

Dynamic Optimization of Nitrogen Use for Improved Water Quality and Crop Yields, Moriah B. Bostian (Lewis & Clark College)*; Tiho Ancev (University of Sydney)

Measuring Multifactor Productivity for the U.S. Fisheries: A Case Study Using the New England Regional Data, Sun Ling Wang (DOC-NOAA and USDA-ERS)*; John B Walden (NOAA/NMFS/NEFSC)

Wednesday June 10th – Young Researchers' Workshop.

8:50am-9:00am: Opening Remarks

9:00am-9:45pm: Keynote Lecture III
Chair: Christopher Parmeter

Industry-Specific Productivity and Spatial Spillovers Through Input-Output Linkages: Evidence from Asia-Pacific Value Chain, Robin Sickles (Rice University)*

10:15am-11:45am: Session I
Chair: Robin Sickles

Labor Market Frictions and Adaptation to Climate Change, Jisung Park (University of California, Los Angeles); Nora M.C. Pankratz (University of California, Los Angeles)*; Arnold Behrer (Harvard University)

   Discussant: TBD

The Role of Product Differentiation in Profit Change: An Analysis of the US Airline Industry, Charles B. Howell (Universitat Autonoma de Barcelona)*; Emili Grifell-Tatjé (Universitat Autonoma de Barcelona); David S. Saal (Loughborough University)

   Discussant: Robin Sickles

12:15pm-1:45pm: Session II
Chair: Ian Wright

Goodness of Fit: Normal-Exponential Versus Normal-Half Normal Distributions, Samah Jradi (Paris School of Business)*; John Ruggiero (Dayton University)

   Discussant: Alecos Papadopoulos

Interpretable Spatial Inefficiency Stochastic Frontier Model, Takahiro Tsukamoto (Nagoya University)*

   Discussant: Luis Orea

Accounting for Dependence in Unbalanced Panel Multiple Output Stochastic Frontier Models using Copulas, Rouven Schmidt (Georg-August-Universität Göttingen)*; Thomas Kneib (Georg-August-Universität Göttingen)

   Discussant: Ian Wright

2:15pm-3:00pm: Keynote Lecture IV
Chair: Daniel Henderson

Reflections on Some New Stochastic Frontier Models, Subal Kumbhakar (SUNY Binghamton)*

3:30pm-5:00pm: Session III
Chair: Cinzia Daraio

Controlling for Environmental Conditions in Regulatory Benchmarking, Emil Heesche (University of Copenhagen)*; Mette Asmild (University of Copenhagen)

Discussant:

Nonparametric Frontier Analysis with Unobserved Inputs: An Application to Endogenous Automation in Railway Traffic Control, Dieter Saelens (KU Leuven)*; Marijn Verschelde (IESEG School of Management); Laurens Cherchye (KU Leuven); Bart Roets (INFRABEL)

Discussant: Cinzia Daraio

Practical Considerations When Modelling Bad Outputs in Data Envelopment Analysis, Lorenz Aigner (University of Copenhagen)*; Mette Asmild (University of Copenhagen); Kent Matthews (Cardiff University); Max Munday (University of Cardiff)

Discussant: Panagiotis Tsiogkidis

Thursday June 11th.

9:00am-9:45am: Keynote Lecture V
Chair: Christopher Parmeter

Is our Field, Productivity & Efficiency Analysis, Coherent with Economics?, Valentin Zelenyuk

10:15am-11:30am: Parallel Sessions I

Metafrontier Applications
Chair: Katsutoshi Mizuta

Sensitivity Analysis of Metafrontier Data Envelopment Analysis for Assessing Soil Carbon Sequestration Efficiencies, Katsutoshi Mizuta (University of Florida, Soil and Water Sciences Department)*; Sabine Grunwald (University of Florida, Soil and Water Sciences Department); Michelle A. Phillips (University of Florida, Economics Department); Charles B. Moss (University of Florida, Food and Resource Economics Department); Wendell P. Cropper (University of Florida School of Forest Resources and Conservation); Allan R. Bacon (University of Florida, Soil and Water Sciences Department)

Is Vertical Disintegration the Future? A Bootstrap Meta-Frontier Approach Measuring Efficiency in the Upstream and Downstream Segment of the Global Oil and Gas Industry, Deepak Sharma (IIT Bombay)*; Haripriya Gundimeda (IIT Bombay)

Applications II
Chair: Tadesse Engida

Organizational Efficiency of Predictive Diagnostics in the Netherlands, Tadesse Engida (Radboud University Medical Center)*

Analyzing SME Financing Constraints and its Determinants Using Stochastic Frontier Analysis. A Comparative Analysis, Maria Martinez Cillero (Economic and Social Research Institute)*

Performance of Countries in the Post Crisis Era, Shirong Zhao (Clemson University)*

12:00pm-1:15pm: Parallel Sessions II

Evaluation of Firms
Chair: Pierluigi Toma

A General Weight Assurance Region Model for Fund Performance Evaluation: An Application to UK Investment Trusts, Stavros A. Kourtzidis (University of Dundee)*; Nickolaos

Tzeremes (University of Thessaly); Suzanne Fifield (University of Dundee)

Legality and Firm Efficiency, Pierluigi Toma (University of Salento)*; Michele Giuranno (University of Salento); Camilla Mastromarco (University of Salento); Diego Ravenda (Toulouse Business School)

The Market Power of Superstar Products, Gianluca Antonecchia (Erasmus School of Economics)*

Understanding the Efficiency of the Entrepreneurial Process, Saul Estrin (London School of Economics); Andrea Herrmann (Utrecht University); Tomasz Mickiewicz (Aston University); Mark Sanders (Utrecht School of Economics)*

Health and Happiness
Chair: Oleg Badunenko

Happy Enough? Where Do You and Your Country Stand? Oleg Badunenko (Brunel University London)*; José M. Cordero (University of Extremadura); Subal Kumbhakar (SUNY Binghamton)

Wealth, Health and Productivity, Kai Du* (University of Queensland); Christopher F. Parmeter (University of Miami); Valentin Zelenyuk (University of Queensland)

Nonparametric Estimation and Evaluation of Capability Sets, Pim Verbunt (KU Leuven); Nicky Rogge (KU Leuven)*; Tom Van Puyenbroeck (KU Leuven)

1:45pm-3:00pm: Parallel Sessions III

Agriculture II
Chair: Jeremy Jelliffe

Gender and Productivity Differentials: An Analysis of Groundnut Farmers in Malawi, Eric S. Owusu (University of Connecticut)*; Boris Bravo-Ureta (University of Connecticut and University of Talca)

Total Factor Productivity and Technical Efficiency Among Smallholder Groundnut Farmers: Preliminary Evidence From Mozambique, Jeremy Jelliffe (University of Connecticut)*; Boris Bravo-Ureta (University of Connecticut and University of Talca); Amade Muitia (Mozambique Agricultural Research Institute)

Impact of Internet Access on the Productivity Evolution of Brazilian Agriculture, Adauto B. Rocha Junior (University of São Paulo)*; Lilyan Fulginiti (University of Nebraska-Lincoln); Richard Perrin (University of Nebraska-Lincoln)

Applications III
Chair: Pinar Geylani

Productivity Growth and Efficiency Analysis: Exporters and Firm-Level Characteristics, Pinar Geylani (Duquesne University)*; Spiro Stefanou (University of Florida)

Immigration and Economic Growth: A Canada-U.S. Comparison, Wulong Gu (Statistics Canada)*; Feng Hou (Statistics Canada)

The Contribution of Resident Physicians to Hospital Productivity, Maria Jose Perez-Villadoniga (University of Oviedo); Ana Rodriguez-Alvarez (University of Oviedo)*; David Roibas (University of Oviedo)

Environment II
Chair: Mahmut Yasar

Technical Change and the Cost of EPA's Cluster Rule, Anna Belova (ICF); Brendan Casey (ICF); Cynthia Morgan (U.S. Environmental Protection Agency); Carl Pasurka (U.S. Environmental Protection Agency)*; Ron Shadbegian (San Diego State University)

Exporting and Pollution Abatement Expenditure: Evidence from Plant-Level Data, Soumendra Banarjee (Misericordia University); Jayjit Roy (Appalachian State University); Mahmut Yasar (University of Texas at Arlington and Emory University)*

On the Palm Oil - Biodiversity Trade-off: Environmental Performance of Smallholder Producers, Bernhard Dalheimer (University of Göttingen)*; Fabian Brambach (University of Göttingen); Holger Kreft (University of Göttingen); Mirawati Yanita (University of Jambi); Bernhard Brümmer (University of Göttingen)

Friday June 12th.

1:00am-2:15am: Parallel Sessions I

 Applications IV
Chair:

 New Dimensions of Performance Evaluations of Governments: Sustainability of Indian Cities, Simanti Bandyopadhyay (Shiv Nadar University)*

 A Comparison of Technological Change Nature in the Chinese Hotel Sector, Linjia Zhang (Xi'an Jiaotong-Liverpool Univeristy)*; Nicolas Peypoch (Université de Perpignan); Yuyang Gang (Henan Normal University)

 Economies of Diversification in Water Supply and Sewerage Treatment: Distance Function Approach, Tomohiro Kitamura (Kobe University)*

 Applications V
Chair:

 Persistent, Transient and Overall Technical and Environmental Efficiency Performance of Large Gold Mines in Developing Countries, Isaiah Magambo (University of Johannesburg)*; Dikgang Dikgang (University of Johannesburg); Dambala Gelo (University of Johannesburg); Fiona Tregenna (University of Johannesburg)

 Increasing Effects of Shareholder-Manager Risk Sharing on Systemic Risk: Evidence from CEO Compensation and CoVar, Natalya Zelenyuk (University of Queensland)*

 The Effects of Cognitive Load on the Poor's Economic Performance, Selina Bruns (University of Göttingen)*; Bernhard Dalheimer (University of Göttingen); Oliver Musshoff (University of Göttingen)

9:00am-10:15am: Parallel Sessions II

 Substitution in Production
Chair: Michele Battisti

 Robot Capital, Michele Battisti* (University of Palermo); Massimo Del Gatto ("G.d'Annunzio" University); Antonio F. Gravina (University of Messina); Christopher F. Parmeter (University of Miami)

 The Role of Intermediate Inputs in Estimating Macroeconomic Production Functions: Capital-Labor-Energy Substitutability in China, Jianglong Li (Harvard-China Project); Arne

Heningsen* (University of Copenhagen)

Do Innovation and Financial Constraints Explain the Profit Efficiency of European Enterprises? Graziella Bonanno* (University of Salerno); Annalisa Ferrando (European Central Bank); Stefani P. S. Rossi (University of Trieste)

The Public Sector
Chair: David Saal

Accounting for Populations Settlement Patterns and Outsourcing in the Estimation of Returns to Scale and Efficiency of Japanese Public Sewer Systems, David S Saal (Loughborough University)*; Takuya Urakami (Kindai University); Maria Nieswand (Loughborough University); Tomohiro Kitamura (Kobe University)

Incorporating Preference Information in a Range Directional Composite Indicator: The Case of Portuguese Public Hospitals, Miguel A. Pereira (Universidade de Lisboa)*; Ana Camanho (University of Porto); José Rui Figueira (Technical University of Lisbon); Rui Marques (CESUR, CERIS, Instituto Superior Técnico, University of Lisbon)

Determining the Efficiency of Residential Electricity Consumption, Mark A. Andor (RWI - Leibniz Institute of Economic Research)*

11:00am-11:45am: Keynote Lecture VI
Chair: Cinzia Daraio

A Survey of Recent Methodological Innovations and Applications, Camilla Mastromarco

12:15pm-1:30pm: Parallel Sessions III

Benchmarking
Chair: Per Agrell

Worst-Practice Benchmarking with Inverted VEA, Giannis Karagiannis (University of Macedonia); Stavros A Kourtzidis (University of Dundee); Panagiotis Ravanos (University of Macedonia)*

Mergers, Break-ups and Performance Under Regulatory Oversight: Who Gets the Benefits? Per Agrell (Louvain School of Management)*; Peter Bogetoft (Copenhagen Business School)

Benchmarking, Contracting, and Incentive Power, Peter Bogetoft (Copenhagen Business School)*

Productivity Spillovers II
Chair: Emir Malikov

Cross-Firm Productivity Spillovers in the Presence of Foreign Investments, Emir Malikov (University of Nevada, Las Vegas)*; Shunan Zhao (Oakland University)

Foreign Technology Sourcing and Sustainable Productivity Growth, Luigi Aldieri (University of Salerno)*; Vania Sena (University of Sheffield); Paolo Vinci (University of Salerno)

Productivity Spillovers and Human Capital: A Semiparametric Varying Coefficient Approach, Man Jin (Oakland University)*; Subal Kumbhakar (SUNY Binghamton); Zhezhi Hou (SUNY Binghamton)

2:00pm-3:15pm: Parallel Sessions IV

Agriculture III
Chair: Timo Sipiläinen

Pseudo-panel Approach to Productivity Measurement in Finnish Agriculture, Timo Sipiläinen (University of Helsinki)*

Productivity Dynamics of Crop Farms: The Role of Farm Technology and Organisational Structure, Felicity Addo (University of Natural Resources and Life Sciences, Vienna)*; Klaus Salhofer (University of Natural Resources and Life Sciences)

Efficiency of Rainbow Trout Production in North-West Germany, Tim Knöpfel (University Göttingen)*

World Heritage Status and Payments for Environmental Services: The Case of the Colombian Coffee Cultural Landscape, Orlando Rodriguez* (Technical University of Munich and Universidad Tecnológica de Pereira); Maria Vrachioli (Technical University of Munich); David Wuepper, (Technical University of Munich and ETH Zurich); Johannes Sauer (Technical University of Munich)

Applications VI
Chair: Wulong Gu

Sustainable Productivity Indices, Eric Njuki (Economic Research Service - USDA)*; Christopher O'Donnell (University of Queensland)

Forward-looking Assessment of the GHG Abatement Cost: Application to China, Xun Zhou (Aalto University School of Business)*; Timo Kuosmanen (Aalto University School of Business); Sheng Dai (Aalto University School of Business)

Are Wages Really Not Keeping up with Productivity? Ryan Macdonald (Statistics Canada); Wulong Gu (Statistics Canada)*; Rene Morrisette (Statistics Canada)

3:30pm-3:45pm: Closing Remarks