



**ATHENS INSTITUTE**

# **Abstract Book**

**21<sup>st</sup> Annual International Symposium on  
Economic Theory, Policy & Applications  
29-30 June & 1-4 July 2026, Athens,  
Greece**

**Edited by  
Gregory T. Papanikos,  
Henry Thompson & Olga Gkounta**

2026



Abstracts  
21<sup>st</sup> Annual International  
Symposium on Economic  
Theory, Policy & Applications  
29-30 June & 1-4 July 2026,  
Athens, Greece

Edited by  
Gregory T. Papanikos,  
Henry Thompson & Olga Gkounta

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# TABLE OF CONTENTS

(In Alphabetical Order by Author's Family Name)

<b>Preface</b>		11
<b>Editors' Note</b>		13
<b>Organizing &amp; Scientific Committee</b>		14
<b>Conference Program</b>		15
<b>1.</b>	<b>Effects of Organizational Culture and Working Conditions on Job Satisfaction in Hazardous Working Environment: A Quantitative Study in Turkish Shipyards</b> <i>A. Zafer Acar, Pinar Acar &amp; Selami Yilmazturk</i>	22
<b>2.</b>	<b>When Does Flexibility Matter? How Remote Work and Flextime Shape Gender Inequality in Time Use</b> <i>Laura Adler</i>	24
<b>3.</b>	<b>From Fairy Tales to Algorithms: AI-Enhanced Bibliotherapy for Mental Health</b> <i>Chekra Allani</i>	25
<b>4.</b>	<b>Nonlinear Dynamics and Stability of Symmetric Vortex Pairs Around a Circular Cylinder</b> <i>Qasem AlMdallal</i>	26
<b>5.</b>	<b>Modification of Bernstein Operational Matrices for Numerical Problem Solving in Applied Mathematics and Engineering</b> <i>Mohammed Alshbool</i>	27
<b>6.</b>	<b>Asymptotics of Large-Dimensional Projection Matrices</b> <i>Stanislav Anatolyev &amp; Maksim Smirnov</i>	28
<b>7.</b>	<b>Impact of B-school Director Brand on B-school Performance: An Empirical Investigation</b> <i>Saikat Banerjee &amp; Akanksha Kumari</i>	29
<b>8.</b>	<b>Understanding Transparency-Oriented Innovation: The Combined Effect of Funding Sources and Actor-Led Initiatives in the Public Sector</b> <i>Maja Basic, Matea Cvjetkovic &amp; Bojan Moric Milovanovic</i>	31
<b>9.</b>	<b>From Monsters to Mascots: Anthropomorphized Germs in Hygiene Advertising</b> <i>Hande Bilsel &amp; Murat Copcu</i>	32
<b>10.</b>	<b>Utilizing Organizational Development Theory to Critically Look at Distance Learning and Teaching during COVID-19</b> <i>Tamara Bell Boyle</i>	34
<b>11.</b>	<b>Development of an Archetypal Perception Model Applied to Entertainment Establishments according to the Chinese Zodiac Calendar</b> <i>Juan Carlos Chica Mesa, Mayerli Vanessa Martinez Castaño &amp; Dayana Perez Quiceno</i>	36
<b>12.</b>	<b>Heterogeneity in the Marginal Propensity to Consume out of Wealth: Evidence from Spanish Panel Data</b> <i>Antonio Cutanda &amp; Juan Alberto Sanchis-Llopis</i>	39

13.	<b>Strategic Networking and Public Sector Innovation: A Cross-Sector Perspective</b> <i>Matea Čojtkovic, Maja Basic &amp; Jasmina Masovic</i>	40
14.	<b>Beyond Euclidean: A Comprehensive Review of Distance Metrics and Dissimilarity Measures in Contemporary Machine Learning</b> <i>Ivan De Boi &amp; Rudi Penne</i>	41
15.	<b>Assessing Accuracy and Reliability of AI-Generated Statistical Interpretations</b> <i>Dulanjalee Devage Dona</i>	43
16.	<b>AI and the Teaching of University-Level Mathematics</b> <i>Michael Dorff</i>	45
17.	<b>The Unequal Impact of Public Mistrust in Labor Markets: Evidence from an Environmental Disaster</b> <i>Philipp Ehrl &amp; Rafael Ribas</i>	46
18.	<b>The Rational Effect of Expiration Dates on Sales and Consumption: Impact on the Value Chain</b> <i>Skander Esseghaier</i>	48
19.	<b>The Impact of Financial Integration on Economic Growth: A Global Analysis Using Panel Data</b> <i>Candida Ferreira</i>	49
20.	<b>Unlocking Circular Economy Potential in the Agro-Industrial Sector: Evidence from Case Studies</b> <i>Susana Garrido, Maria Bernardo &amp; Carmina Nunes</i>	50
21.	<b>Analysis of the Food Supply Chain: Difficulties, Challenges and Solutions in North Macedonia</b> <i>Marvin E. Gonzalez</i>	52
22.	<b>Integration between a Multicriteria Decision Making (MCDM) Method and Designing of AI Based Decision Support Systems (DSS)</b> <i>Gil Greenstein</i>	54
23.	<b>Methods of Solving Complex Math Problems</b> <i>Ellina Grigorieva</i>	56
24.	<b>Airport-Airline Optimization Methodology via AI - Blockchain Application</b> <i>Reza Hamzaee</i>	57
25.	<b>Towards a Model of Sustainable Management of the Adriatic Islands: A Macromarketing Approach and the Role of Stakeholders</b> <i>Anica Hunjet, Boris Jurič &amp; Dijana Vuković</i>	58
26.	<b>Beyond Good Intentions - The Mental Barriers to Green Hospitality</b> <i>Frederic Jallat</i>	60
27.	<b>Are the High Risk-Taking American Entrepreneurs Averse to Risk Taking in the UAE's Business Environment? A Conceptual Study</b> <i>Reynold James</i>	61

28.	<b>New Monetary Policy: Is this the Appropriate One?</b> <i>Ioannis Kallianiotis</i>	62
29.	<b>The Impact of Income on Inequality in the Context of Kazakhstan's Social Policy: An Empirical Analysis</b> <i>Dana Kangalakova, Zaira Satpayeva &amp; Aisulu Moldabekova</i>	63
30.	<b>Acquiring Socially Responsible Brands: When it Helps and when it Hurts CSR Perceptions</b> <i>Argiro Kliamenakis, Bianca Grohmann &amp; Onur Bodur</i>	64
31.	<b>Accurate Computations with Totally Nonnegative Matrices of Any Rank</b> <i>Plamen Koev, Jorge Delgado, Ana Marco, Juan Manuel Pena, José-Javier Martines &amp; Raquel Viana</i>	66
32.	<b>My Sustainability Isn't Really Mine: Material Friction and Environmental Dependence in Sustainable Consumption</b> <i>Matthew Lunde</i>	67
33.	<b>Making the Case: The Impact of Case Studies and Experiential Learning on Brand Equity and Employment Interest</b> <i>Robert Mackalski, Seth Polsley &amp; Kasey Linde</i>	69
34.	<b>Mathematics Education Worldwide</b> <i>Gohar Marikyan</i>	70
35.	<b>Household Consumption Expenditure and Credit Burden Patterns: An Empirical Regional Analysis of Kazakhstan</b> <i>Aisulu Moldabekova, Dana Kangalakova &amp; Zaira Satpayeva</i>	71
36.	<b>Mathematics Teacher Training in a Pedagogy Course: A Narrative Research on Memories in Relation to Mathematics</b> <i>Luciane Mulazani dos Santos</i>	73
37.	<b>Some Properties of the Generalized Pareto Distribution</b> <i>Ampalavanar Nanthakumar</i>	75
38.	<b>Dialogic Interactions in the Era of Intense Teleworking: A Conceptual Model and Research Agenda for Trust Dynamics</b> <i>Margarita Nyfoudi</i>	77
39.	<b>Private Versus Public Sector Wage Leadership: Incorporating the Role of Asymmetry</b> <i>Martin O'Brien</i>	78
40.	<b>Migration and Remittance Decisions: Evidence from a Recursive Bivariate Probit Model of Bangladeshi Households</b> <i>Lucky Otame &amp; Mehdi Chowdhury</i>	79
41.	<b>Heuristics and Bounded Rationality in Behavioral Economics: A Systematic Mapping Study</b> <i>Erica Patente Nascimento, Eric Noventa de Souza, Marcela Ribeiro de Albuquerque &amp; Leonardo José Oliveira e Silva Rosalem</i>	80
42.	<b>The Axis of Ruled Surfaces of Revolution, 3D Laser Scanners, and Laser Dot Conics</b> <i>Rudi Penne &amp; Ivan De Boi</i>	81

43.	<b>Examining the Importance of Macro and Micro Country Branding Dimensions: Do They Differ by Consumer Demographics?</b> <i>Musa Pinar &amp; Tulay Girard</i>	83
44.	<b>Central Bank Profits, Liquidity, Risks, and Money Creation</b> <i>Zbigniew Polanski &amp; Mikołaj Szadkowski</i>	85
45.	<b>The European Economic Convergence in CEE – Structural Developments and Challenges</b> <i>Andrei Radulescu &amp; Iulia Monica Oehler Sincai</i>	87
46.	<b>Is Green the New Gold? How Identity and Values Shape Sustainability Perceptions in Luxury among Gen X and Gen Z</b> <i>Mignon Reyneke, Federica Ceccarelli &amp; Gillian Wright</i>	89
47.	<b>Financialization and the Supplementary Health System in Brazil: A Bibliographic Study</b> <i>Marcela Ribeiro de Albuquerque, Luis Ricardo da Silva Miguel &amp; Erica Patente Nascimento</i>	91
48.	<b>Competitiveness of European Countries</b> <i>Hemmat Safwat</i>	92
49.	<b>Consumer Acceptance of Cultured Meat in Türkiye: Making Sense of the Unnatural</b> <i>Cigdem Sahin Basfirinci</i>	93
50.	<b>Development of Kazakhstan’s Innovation Infrastructure in the Context of Digitalization</b> <i>Zaira Satpayeva &amp; Dana Kangalakova</i>	95
51.	<b>Using Competitive Sport to Develop Entrepreneurial Skills</b> <i>Robert Schneider</i>	96
52.	<b>Engaging the Next Generation: A Strategic Imperative for Credit Unions in the Social Media Era</b> <i>Samuel Seaman</i>	97
53.	<b>The Institutional Paradox: Stability, Power, and Change in Emerging Political Economies</b> <i>Nitya Singh</i>	99
54.	<b>The Evolution of Influencer Credibility Dimensions in the Skincare Industry: A Systematic Literature Review (2020–2026)</b> <i>Radmila Stevanovic &amp; Miloš Milosavljević</i>	101
55.	<b>On Algebraic Behaviors in the Stability Theory</b> <i>Codruta Simona Stoica</i>	103
56.	<b>Social Discount Rate Dilemmas in Benefit-Cost Analysis</b> <i>Szabolcs Szekeres</i>	104
57.	<b>Tariffs and Factor Prices with Flexible Energy Supply</b> <i>Henry Thompson &amp; Alexi Thompson</i>	106
58.	<b>Hybrid Address Normalization Using NLP and Large Language Models for Public Health Geospatial Analysis</b> <i>Ricardo Timaran-Pereira, Jonathan Viveros-Córdoba &amp; Andrés Calderón Romero</i>	107

59.	<b>Leveraging AI-Enabled Marketing to Build Dynamic Capabilities in Early-Stage Startups</b> <i>Asdren Toska &amp; Flokart Aliu</i>	108
60.	<b>From Empathy Mapping to Immersive Experience: Participatory Narrative Design for Emotional Audience Engagement</b> <i>Tzu-wei Tsai</i>	109
61.	<b>Construction of Finite Tight Frames via Singular Value Decomposition</b> <i>Long Wang &amp; Jun Ji</i>	111
62.	<b>csNavigator: An Agentic AI Application for Enhanced Student Advising and Learning Support</b> <i>Shuangbao Wang</i>	112
63.	<b>Traveling Salesman Problem and Hamiltonian Principle</b> <i>Yong Wang</i>	114
64.	<b>Risks of Artificial Intelligence (AI) in Sustainable Construction Management: An AI-Agile Risk Management Framework</b> <i>Nesreen Weshah, Aghnia Krishti &amp; Leonardo Lynch</i>	115
65.	<b>Hybrid Topic-Based Sentiment Analysis for Customer Experience Analytics</b> <i>Evangelos Xevelonakis</i>	117
66.	<b>Keep Pace with Blockchain to Witness Transformation in B2B Interactions</b> <i>Shahrazad Yaghtin, Joel Mero &amp; Teck Ming Tan</i>	118
67.	<b>The Influence of Prior Corporate Image and News Valence on Public Perceptions: Halo Effects, Devil Effects, and Perceived Corporate Hypocrisy</b> <i>Yie-Jing Yang</i>	120
68.	<b>What Affects Teachers' Use of Technology? Teacher Beliefs Regarding Technology, Teachers' Technological Skills, or Available Sources of Support?</b> <i>Roman Yavich</i>	121
69.	<b>The Role of Continuity in Set-Based Thinking: Discovering the Nature of Numbers Taught by the Nine Chapters on Mathematical Art in Ancient China</b> <i>Jinmei Yuan</i>	122
70.	<b>Rethinking Biomarker Cutoffs in Precision Medicine</b> <i>Maroussa Zagoraïou, Alessandro Baldi Antognini, Rosamarie Frieri &amp; Sara Cecconi</i>	123
<b>References</b>		124



## Preface

This book includes the abstracts of all the papers presented at the *21<sup>st</sup> Annual International Symposium on Economic Theory, Policy & Applications* (29-30 June & 1-4 July 2026), organized by the Athens Institute.

A full symposium program can be found before the relevant abstracts. In accordance with Athens Institute's Publication Policy, the papers presented during this conference will be considered for inclusion in one of the Athens Institute's many publications only after a blind peer review process.

The purpose of this abstract book is to provide members of the Athens Institute and other academics around the world with a resource through which they can discover colleagues and additional research relevant to their own work. This purpose is in congruence with the overall mission of the association. Athens Institute was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world can meet to exchange ideas on their work and consider the future developments of their fields of study.

To facilitate the communication, a references section includes all the abstract books published as part of this symposium (Table 1). I invite the readers to access these abstract books –these are available for free– and compare how the themes of the conference have evolved over the years. According to the Athens Institute's mission, the presenters in these conferences are coming from many different countries, presenting various topics.

**Table 1.** *Publication of Books of Abstracts of Proceedings, 2010-2026*

Year	Papers	Countries	References
2026	70	31	Papanikos et al. (2026)
2025	80	34	<a href="#">Papanikos and Papanikou (2025)</a>
2024	89	34	<a href="#">Papanikos and Gkounta (2024)</a>
2023	73	26	<a href="#">Thompson and Gkounta (2023)</a>
2022	55	30	<a href="#">Thompson and Gkounta (2022)</a>
2021	38	19	<a href="#">Papanikos (2021)</a>
2020	44	25	<a href="#">Papanikos (2020)</a>
2019	93	33	<a href="#">Papanikos (2019)</a>
2018	83	33	<a href="#">Papanikos (2018)</a>
2017	18	17	<a href="#">Papanikos (2017)</a>
2016	22	17	<a href="#">Papanikos (2016)</a>
2015	30	18	<a href="#">Papanikos (2015)</a>
2014	25	16	<a href="#">Papanikos (2014)</a>

2013	54	33	<a href="#">Papanikos (2013)</a>
2012	52	29	<a href="#">Papanikos (2012)</a>
2011	84	30	<a href="#">Papanikos (2011)</a>
2010	82	30	<a href="#">Papanikos (2010)</a>

It is our hope that through Athens Institute's conferences and publications, Athens will become a place where academics and researchers from all over the world can regularly meet to discuss the developments of their disciplines and present their work. Since 1995, Athens Institute has organized more than 400 international conferences and has published over 200 books. Academically, the institute is organized into 7 divisions and 37 units. Each unit organizes at least one annual conference and undertakes various small and large research projects.

For each of these events, the involvement of multiple parties is crucial. I would like to thank all the participants, the members of the organizing and academic committees, and most importantly the administration staff of the Athens Institute for putting this symposium and its subsequent publications together.

**Gregory T. Papanikos**  
**President**

## Editors' Note

These abstracts provide a vital means to the dissemination of scholarly inquiry in the field of Economics. The breadth and depth of research approaches and topics represented in this book underscores the diversity of the symposium.

Athens Institute's mission is to bring together academics from all corners of the world in order to engage with each other, brainstorm, exchange ideas, be inspired by one another, and once they are back in their institutions and countries to implement what they have acquired. The *21<sup>st</sup> Annual International Symposium on Economic Theory, Policy & Applications*, accomplished this goal by bringing together academics and scholars from 31 different countries (Australia, Belgium, Brazil, Canada, China, Colombia, Croatia, Czech Republic, Finland, France, Hungary, India, Israel, Italy, Kazakhstan, Kosovo, Kuwait, Morocco, Poland, Portugal, Romania, Saudi Arabia, Serbia, Spain, Switzerland, Taiwan, The Netherlands, Türkiye, UAE, UK, USA), which brought in the symposium the perspectives of many different country approaches and realities in the field.

Publishing this book can help that spirit of engaged scholarship continue into the future. With our joint efforts, the next editions of this symposium will be even better. We hope that this abstract book as a whole will be both of interest and of value to the reading audience.

**Gregory T. Papanikos, Henry Thompson & Olga Gkounta**  
Editors

## **21<sup>st</sup> Annual International Symposium on Economic Theory, Policy & Applications, 29-30 June & 1-4 July 2026, Athens, Greece**

### **Organizing & Scientific Committee**

All Athens Institute's conferences are organized by the Academic Council. This symposium has been organized with the assistance of the following academic members of Athens Institute.

Dr. Gregory T. Papanikos, President, Athens Institute & Professor (Adjunct), University of Tennessee, Knoxville, USA.

Dr. Chris Sakellariou, Vice President of Finance, Athens Institute & Associate Professor of Economics (Retired), Nanyang Technological University, Singapore.

Dr. Henry Thompson, Head, Economics Unit, Athens Institute & Emeritus Professor, Auburn University, USA.

Dr. Sharon Claire Bolton, Vice President of Research, Athens Institute & Emeritus Professor, The Management School, University of Stirling, Scotland.

Dr. Frederic Jallat, Deputy Director (Management & Marketing), Business, Economics and Law Division, Athens Institute & Professor, ESCP Business School, France.

Dr. Anica Hunjet, Deputy Director, Business and Law Division, Athens Institute & Vice Rector, University North, Croatia.

Dr. Timothy M. Young, Director, Center for Data Science (CDS), Emeritus Professor, The University of Tennessee, USA & CEO and President, T.M. Young Institute, LLC, USA.

Dr. Philip G. Cerny, Director, Social Sciences Division, Athens Institute & Professor Emeritus, University of Manchester (UK) and Rutgers University (USA).

Dr. Ampalavanar Nanthakumar, Director, Sciences Division, Athens Institute & Professor, State University of New York (Oswego), USA.

Dr. Nikolaos I. Liodakis, Associate Professor, Wilfrid Laurier University, Canada.

Dr. Paul Contoyannis, Associate Professor & Director of Graduate Studies, McMaster University, Canada.

Dr. Cleopatra Veloutsou, Professor of Brand Management, University of Glasgow, U.K.

Dr. Codruta Simona Stoica, Head, Mathematics & Statistics Research Unit, Athens Institute & Professor and Vice-Rector, Aurel Vlaicu University of Arad, Romania.

Dr. Theodore Trafalis, Head, Industrial Unit, Athens Institute & Professor of Industrial & Systems Engineering and Director, Optimization & Intelligent Systems Laboratory, The University of Oklahoma, USA.

Dr. Angelos Tsaklanganos, Emeritus Professor, Aristotle University of Thessaloniki, Greece.

**FINAL CONFERENCE PROGRAM**  
**21<sup>st</sup> Annual International Symposium on Economic Theory, Policy & Applications, 29-30 June & 1-4 July 2026, Athens, Greece**

**PROGRAM**

Monday 29 June 2026

08:30-09:15

**Registration**

09:15-10:00 **Opening Speech and Welcoming Remarks**

**Speaker: Gregory T. Papanikos**, President, Athens Institute & Professor (Adjunct), University of Tennessee, Knoxville, USA.

**10:00-11:30 Session 1**

<b>Session 1a</b> <b>Moderator: Henry Thompson</b> , Head, <u>Economics Unit</u> , Athens Institute & Emeritus Professor, Auburn University, USA.	<b>Session 1b</b> <b>Moderator: Cleopatra Veloutsou</b> , Head, <u>Marketing Unit</u> , Athens Institute & Professor of Brand Management, University of Glasgow, UK.	<b>Session 1c</b> <b>Moderator: Ampalavanar Nanthakumar</b> , Director, <u>Sciences Division</u> , Athens Institute & Distinguished Teaching Professor, State University of New York at Oswego, USA.
<ol style="list-style-type: none"> <li>1. <b>Ioannis Kallianiotis</b>, Professor, University of Scranton, USA. <i>Title: New Monetary Policy: Is this the Appropriate One?</i></li> <li>2. <b>Zbigniew Polanski</b>, Professor and Head, Department of Economic Policy and Monetary Theory, SGH Warsaw School of Economics, Poland. <b>Mikołaj Szadkowski</b>, Professor, SGH Warsaw School of Economics, Poland. <i>Title: Central Bank Profits, Liquidity, Risks, and Money Creation.</i></li> <li>3. <b>Zafer Acar</b>, Dean, Faculty of Applied Sciences, Istanbul Bilgi University, Türkiye. <b>Pinar Acar</b>, Head, Department of Human Resources Management, Istanbul Medipol University, Türkiye. <b>Selami Yilmaztürk</b>, Graduate Student, Piri Reis University, Türkiye. <i>Title: Effects of Organizational Culture and Working Conditions on Job Satisfaction in</i></li> </ol>	<ol style="list-style-type: none"> <li>1. <b>Musa Pinar</b>, Professor, Valparaiso University, USA. <b>Tulay Girard</b>, Professor, Penn State Altoona, USA. <i>Title: Examining the Importance of Macro and Micro Country Branding Dimensions: Do They Differ by Consumer Demographics?</i></li> <li>2. <b>Saikat Banerjee</b>, Professor, Indian Institute of Foreign Trade, Kolkata Campus, India. <b>Akanksha Kumari</b>, Researcher, Indian Institute of Foreign Trade, Kolkata Campus, India. <i>Title: Impact of B-school Director Brand on B-school Performance: An Empirical Investigation.</i></li> <li>3. <b>Mignon Reyneke</b>, Associate Professor, TIAS Business School, Tilburg University, The Netherlands. <b>Federica Ceccarelli</b>, Researcher, TIAS Business School, Tilburg University, The Netherlands. <b>Gillian Wright</b>, Professor, TIAS Business School, Tilburg University, The Netherlands. <i>Title: Is Green the New Gold? How Identity and Values Shape Sustainability Perceptions in Luxury among Gen X and Gen Z.</i></li> <li>4. <b>Cigdem Sahin Basfirinci</b>, Professor, Trabzon University, Türkiye. <b>Hazal Duman Alptekin</b>, Assistant Professor, Canakkale Onsekiz Mart University, Türkiye.</li> </ol>	<ol style="list-style-type: none"> <li>1. <b>Codruta Simona Stoica</b>, Professor, "Aurel Vlaicu" University of Arad, Romania. <i>Title: On Algebraic Behaviors in the Stability Theory.</i></li> <li>2. <b>Michael Dorff</b>, Professor &amp; Chair, Department of Mathematics, Brigham Young University, USA. <i>Title: AI and the Teaching of University-Level Mathematics.</i></li> <li>3. <b>Luciane Mulazani dos Santos</b>, Full Professor, Santa Catarina State University (UDESC), Brazil. <i>Title: Mathematics Teacher Training in a Pedagogy Course: A Narrative Research on Memories in Relation to Mathematics.</i></li> <li>4. <b>Gohar Marikyan</b>, Full Professor, SUNY Empire State University, USA. <i>Title: Mathematics Education Worldwide.</i></li> </ol>

<p><i>Hazardous Working Environment: A Quantitative Study in Turkish Shipyards.</i></p> <p>4. <b>Hemmat Safwat</b>, Director, Energy Development Services, Greece. <i>Title: Competitiveness of European Countries.</i></p>	<p><b>Gulcan Sener</b>, Associate Professor, Trabzon University, Türkiye. <i>Title: Consumer Acceptance of Cultured Meat in Türkiye: Making Sense of the Unnatural.</i></p>	
<p><b>11:30-13:00 Session 2</b></p>		
<p><b>Session 2a</b> <b>Moderator: Ioannis Kallianiotis</b>, Professor, University of Scranton, USA.</p>	<p><b>Session 2b</b> <b>Moderator: Musa Pinar</b>, Professor, Valparaiso University, USA.</p>	<p><b>Session 2c</b> <b>Moderator: Codruta Simona Stoica</b>, Head, <u>Mathematics &amp; Statistics Unit</u>, Athens Institute &amp; Professor and Vice-Rector, Aurel Vlaicu University of Arad, Romania.</p>
<p>1. <b>Henry Thompson</b>, Emeritus Professor, Auburn University, USA. <b>Alexi Thompson</b>, Assistant Professor, South Carolina State University, USA. <i>Title: Tariffs and Factor Prices with Flexible Energy Supply.</i></p> <p>2. <b>Zaira Satpayeva</b>, Associate Professor and Senior Researcher, Institute of Economics, Science Committee of the Ministry of Science and Higher Education, Kazakhstan. <b>Dana Kangalakova</b>, Senior Researcher, Institute of Economics, Science Committee of the Ministry of Science and Higher Education, Kazakhstan. <i>Title: Development of Kazakhstan's Innovation Infrastructure in the Context of Digitalization.</i></p> <p>3. <b>Laura Adler</b>, Assistant Professor, Yale University, USA. <i>Title: When Does Flexibility Matter? How Remote Work and Flextime Shape Gender Inequality in Time Use.</i></p> <p>4. <b>Margarita Nyfoudi</b>, Associate Professor, University of Birmingham, UK. <i>Title: Dialogic Interactions in the Era of Intense Teleworking: A Conceptual Model and Research Agenda for Trust Dynamics.</i></p>	<p>1. <b>Frederic Jallat</b>, Professor, ESCP Business School, France. <i>Title: Beyond Good Intentions - The Mental Barriers to Green Hospitality.</i></p> <p>2. <b>Skander Esseghaier</b>, Associate Professor, Mohammed VI Polytechnic University, Morocco. <i>Title: The Rational Effect of Expiration Dates on Sales and Consumption: Impact on the Value Chain.</i></p> <p>3. <b>Robert Mackalski</b>, Associate Professor, University of Nebraska-Lincoln, USA. <b>Seth Polsley</b>, Assistant Professor, University of Nebraska-Lincoln, USA. <b>Kasey Linde</b>, Director of Teaching, Learning and Accreditation, University of Nebraska-Lincoln, USA. <i>Title: Making the Case: The Impact of Case Studies and Experiential Learning on Brand Equity and Employment Interest.</i></p>	<p>1. <b>Ampalavanar Nanthakumar</b>, Distinguished Teaching Professor, State University of New York at Oswego, USA. <i>Title: Some Properties of the Generalized Pareto Distribution.</i></p> <p>2. <b>Maroussa Zagoraïou</b>, Full Professor, University of Bologna, Italy. <b>Alessandro Baldi Antognini</b>, Full Professor, University of Bologna, Italy. <b>Rosamarie Frieri</b>, Researcher, University of Bologna, Italy. <b>Sara Cecconi</b>, Teaching Assistant, University of Bologna, Italy. <i>Title: Rethinking Biomarker Cutoffs in Precision Medicine.</i></p> <p>3. <b>Mohammed Alshbool</b>, Associate Professor, Zayed University, UAE. <i>Title: Modification of Bernstein Operational Matrices for Numerical Problem Solving in Applied Mathematics and Engineering.</i></p> <p>4. <b>Stanislav Anatolyev</b>, Associate Professor, CERGE-EI, Czech Republic. <b>Maksim Smirnov</b>, PhD Student, CERGE-EI, Czech Republic. <i>Title: Asymptotics of Large-Dimensional Projection Matrices.</i></p>

	<p>4. <b>Matthew Lunde</b>, Assistant Professor, University of Minnesota Duluth, USA. <i>Title: My Sustainability Isn't Really Mine: Material Friction and Environmental Dependence in Sustainable Consumption.</i></p>	
<b>13:00-14:30 Session 3</b>		
<p><b>Session 3a</b> <b>Moderator: A. Zafer Acar</b>, Dean, Faculty of Applied Sciences, Istanbul Bilgi University, Türkiye.</p>	<p><b>Session 3b</b> <b>Moderator: Frederic Jallat</b>, Deputy Director (Management &amp; Marketing), <u>Business, Economics and Law Division</u>, Athens Institute &amp; Professor, ESCP Business School, France.</p>	<p><b>Session 3c</b> <b>Moderator: Gohar Marikyan</b>, Deputy Director, <u>Sciences Division</u>, Athens Institute &amp; Professor, SUNY Empire State University, USA.</p>
<p>1. <b>Matea Cvjetkovic</b>, Research Associate, Institute of Public Finance, Croatia. <b>Maja Basic</b>, Senior Research Fellow, Institute of Public Finance, Croatia. <b>Jasmina Masovic</b>, Research Associate, Institute of Public Finance, Croatia. <i>Title: Strategic Networking and Public Sector Innovation: A Cross-Sector Perspective.</i></p> <p>2. <b>Maja Basic</b>, Senior Research Fellow, Institute of Public Finance, Croatia. <b>Matea Cvjetkovic</b>, Research Associate, Institute of Public Finance, Croatia. <b>Bojan Moric Milovanovic</b>, Professor, Libertas International University, Croatia. <i>Title: Understanding Transparency-Oriented Innovation: The Combined Effect of Funding Sources and Actor-Led Initiatives in the Public Sector.</i></p> <p>3. <b>Dana Kangalakova</b>, Senior Researcher, Institute of Economics, Science Committee of the Ministry of Science and Higher Education, Kazakhstan. <b>Zaira Satpayeva</b>, Associate Professor and Senior Researcher, Institute of Economics, Science Committee of the Ministry of Science and Higher Education, Kazakhstan. <b>Aisulu Moldabekova</b>, Senior Researcher, Institute of Economics, Science Committee of the Ministry of Science and Higher Education, Kazakhstan. <i>Title: The Impact of Income on Inequality in the Context of Kazakhstan's Social Policy: An Empirical Analysis.</i></p>	<p>1. <b>Evangelos Xevelonakis</b>, Professor, HWZ Zurich University of Applied Sciences in Business Administration, Switzerland. <i>Title: Hybrid Topic-Based Sentiment Analysis for Customer Experience Analytics.</i></p> <p>2. <b>Tzu-wei Tsai</b>, Professor and Dean, College of Design, National Taichung University of Science and Technology, Taiwan. <i>Title: From Empathy Mapping to Immersive Experience: Participatory Narrative Design for Emotional Audience Engagement.</i></p> <p>3. <b>Shahrzad Yaghtin</b>, Assistant Professor, ESDES Business School, Université Catholique de Lyon, France. <b>Joel Mero</b>, Associate Professor, University of Jyväskylä, Finland. <b>Teck Ming Tan</b>,</p>	<p>1. <b>Antonio Cutanda</b>, Professor, University of Valencia, Spain. <b>Juan Alberto Sanchis-Llopis</b>, Professor, University of Valencia, Spain. <i>Title: Heterogeneity in the Marginal Propensity to Consume out of Wealth: Evidence from Spanish Panel Data.</i></p> <p>2. <b>Candida Ferreira</b>, Professor, University of Lisbon, Portugal. <i>Title: The Impact of Financial Integration on Economic Growth: A Global Analysis Using Panel Data.</i></p> <p>3. <b>Szabolcs Szekeres</b>, Member, Hungarian Economics Association, Hungary. <i>Title: Social Discount Rate Dilemmas in Benefit-Cost Analysis.</i></p> <p>4. <b>Dulanjalee Devage Dona</b>, Assistant Professor, University of Wisconsin-</p>

<p>4. <b>Andrei Radulescu</b>, Senior Researcher, Institute for World Economy, Romanian Academy, Romania. <b>Iulia Monica Oehler Sincai</b>, Senior Researcher, Institute for World Economy, Romanian Academy, Romania. <i>Title: The European Economic Convergence in CEE – Structural Developments and Challenges.</i></p>	<p>Associate Professor, Oulu Business School, University of Oulu, Finland. <i>Title: Keep Pace with Blockchain to Witness Transformation in B2B Interactions.</i></p> <p>4. <b>Asdren Toska</b>, Co-Founder and Director, Toska Electronics, Kosovo. <b>Flokart Aliu</b>, Professor, University of Prishtina, Kosovo. <i>Title: Leveraging AI-Enabled Marketing to Build Dynamic Capabilities in Early-Stage Startups.</i></p>	<p>Whitewater, USA. <i>Title: Assessing Accuracy and Reliability of AI-Generated Statistical Interpretations.</i></p>
<p><b>14:30-15:30 Lunch</b></p>		
<p><b>15:30-17:00 Session 4 – Meeting on the <u>Athens Institute Undergraduate Economics Competition (AIUEC)</u></b></p>		
<p style="text-align: center;"><b>Presentation and Discussion</b></p>		
<p><b>18:00-20:00 Session 5 – Visit Aristotle’s Lyceum</b></p>		
<p><b>This is not a guided tour</b>, and participation in this visit is <b>not included in any conference registration fee. It requires pre-booking.</b> It includes visits to Aristotle’s Lyceum, the Panathenaic Stadium (Kallimarmaro), the National Garden, the statues of Sophocles, Aeschylus, and Euripides, and Syntagma Square, where the tour concludes in front of the Hellenic Parliament. <a href="#">Click here</a> for more details.</p>		
<p><b>20:30-22:30 Athenian Early Evening Symposium (Sequence of Events: Ongoing Academic Discussions, Dinner, Wine and Water, Music, Dance)</b> <b>Tuesday 30 June 2026</b></p>		
<p><b>09:00-11:00 Session 6</b></p>		
<p><b>Session 6a</b> <b>Moderator: Evangelos Xevelonakis</b>, Professor, HWZ Zurich University of Applied Sciences in Business Administration, Switzerland.</p>	<p><b>Session 6b</b> <b>Moderator: Ivan De Boi</b>, Postdoctoral Researcher, University of Antwerp, Belgium.</p>	
<p>1. <b>Robert Schneider</b>, Distinguished Service Professor, State University of New York at Brockport, USA. <i>Title: Using Competitive Sport to Develop Entrepreneurial Skills.</i></p> <p>2. <b>Marvin E. Gonzalez</b>, Associate Professor, College of Charleston, USA. <i>Title: Analysis of the Food Supply Chain: Difficulties, Challenges and Solutions in North Macedonia.</i></p> <p>3. <b>Reynold James</b>, Associate Professor, Zayed University, UAE. <i>Title: Are the High Risk-Taking American Entrepreneurs Averse to Risk Taking in the UAE’s Business Environment? A Conceptual Study.</i></p> <p>4. <b>Aisulu Moldabekova</b>, Senior Researcher, Institute of Economics, Science Committee of the Ministry of Science and Higher Education, Kazakhstan. <b>Dana Kangalakova</b>, Senior Researcher, Institute of Economics, Science Committee of the Ministry of Science and Higher Education, Kazakhstan. <b>Zaira Satpayeva</b>, Associate Professor and Senior</p>	<p>1. <b>Samuel Seaman</b>, Professor, Pepperdine University, USA. <i>Title: Engaging the Next Generation: A Strategic Imperative for Credit Unions in the Social Media Era.</i></p> <p>2. <b>Ricardo Timaran-Pereira</b>, Professor, Universidad de Nariño, Colombia. <b>Jonathan Viveros-Córdoba</b>, Systems Engineer, Universidad de Nariño, Colombia. <b>Andrés Calderón Romero</b>, Assistant Professor, Pontificia Universidad Javeriana, Colombia. <i>Title: Hybrid Address Normalization Using NLP and Large Language Models for Public Health Geospatial Analysis.</i></p> <p>3. <b>Shuangbao Wang</b>, Professor &amp; Chair, Department of Computer</p>	

<p>Researcher, Institute of Economics, Science Committee of the Ministry of Science and Higher Education, Kazakhstan. <i>Title: Household Consumption Expenditure and Credit Burden Patterns: An Empirical Regional Analysis of Kazakhstan.</i></p> <p>5. <b>Susana Garrido</b>, Associate Professor, University of Coimbra, Portugal. <b>Maria Bernardo</b>, MSc Student, University of Coimbra, Portugal. <b>Carmina Nunes</b>, Adjunct Professor, Instituto Politécnico de Setúbal, Escola Superior de Ciências Empresariais, Life Quality Research Center, GOVCOPP, Portugal. <i>Title: Unlocking Circular Economy Potential in the Agro-Industrial Sector: Evidence from Case Studies.</i></p>	<p>Science, Morgan State University, USA. <i>Title: csNavigator: An Agentic AI Application for Enhanced Student Advising and Learning Support.</i></p> <p>4. <b>Chekra Allani</b>, Assistant Professor, Arab Open University – Kuwait, Kuwait. <i>Title: From Fairy Tales to Algorithms: AI-Enhanced Bibliotherapy for Mental Health.</i></p> <p>5. <b>Nesreen Weshah</b>, Instructor, Southern Alberta Institute of Technology (SAIT), Canada. <b>Shahinaz Hanem Abdellatif</b>, Associate Professor, University Canada West, Canada. <b>Aghnia Krishti</b>, Master’s Student, University Canada West, Canada. <b>Leonardo Lynch</b>, Master’s Student, University Canada West, Canada. <i>Title: Risks of Artificial Intelligence (AI) in Sustainable Construction Management: An AI-Agile Risk Management Framework.</i></p>	
<b>11:00-12:30 Session 7</b>		
<p><b>Session 7a</b> <b>Moderator: Zbigniew Polanski</b>, Professor and Head, Department of Economic Policy and Monetary Theory, SGH Warsaw School of Economics, Poland.</p>	<p><b>Session 7b</b> <b>Moderator: Matthew Lunde</b>, Assistant Professor, University of Minnesota Duluth, USA.</p>	<p><b>Session 7c</b> <b>Moderator: Ellina Grigorieva</b>, Professor, Texas Woman’s University, USA.</p>
<p>1. <b>Reza Hamzaee</b>, BOG-Distinguished Professor Emeritus, Missouri Western State University &amp; President/CEO, RMH Econometrics/Bus Management Consultants, Inc., RMD Hamzaee Econometrics International Consultants, LLC., USA. <i>Title: Airport-Airline Optimization Methodology via AI – Blockchain Application.</i></p> <p>2. <b>Gil Greenstein</b>, Senior Lecturer, Head of M.Sc. Program, Holon Institute of Technology (H.I.T), Israel. <i>Title: Integration between a Multicriteria Decision Making (MCDM) Method and Designing of AI Based Decision Support Systems (DSS).</i></p> <p>3. <b>Marcela Ribeiro De Albuquerque</b>, Professor, State University of Northern Paraná (UENP), Brazil. <b>Luis Ricardo da Silva Miguel</b>, Student, State University of</p>	<p>1. <b>Yie-Jing Yang</b>, Professor, Shih Hsin University, Taiwan. <i>Title: The Influence of Prior Corporate Image and News Valence on Public Perceptions: Halo Effects, Devil Effects, and Perceived Corporate Hypocrisy.</i></p> <p>2. <b>Argiro Kliamenakis</b>, Assistant Professor, University of Ottawa, Canada. <b>Bianca Grohmann</b>, Professor, Concordia University, Canada. <b>Onur Bodur</b>, Professor, Concordia University, Canada. <i>Title: Acquiring Socially Responsible Brands: When it Helps and when it Hurts CSR Perceptions.</i></p> <p>3. <b>Radmila Stevanovic</b>, PhD Student, University of</p>	<p>1. <b>Rudi Penne</b>, Full Professor, University of Antwerp, Belgium. <b>Ivan De Boi</b>, Postdoctoral Researcher, University of Antwerp, Belgium. <i>Title: The Axis of Ruled Surfaces of Revolution, 3D Laser Scanners, and Laser Dot Conics.</i></p> <p>2. <b>Yong Wang</b>, Professor, North China Electric Power University, China. <i>Title: Traveling Salesman Problem and Hamiltonian Principle.</i></p> <p>3. <b>Qasem AlMdallal</b>, Professor, United Arab Emirates University, UAE. <i>Title: Nonlinear Dynamics and Stability of Symmetric Vortex Pairs Around a Circular Cylinder.</i></p> <p>4. <b>Roman Yavich</b>, Associate Professor, Ariel University, Israel. <i>Title: What Affects Teachers’ Use of Technology? Teacher</i></p>

<p>Northern Paraná (UENP), Brazil. <b>Erica Patente Nascimento</b>, Professor, State University of Northern Paraná (UENP), Brazil. <i>Title: Financialization and the Supplementary Health System in Brazil: A Bibliographic Study.</i></p>	<p>Belgrade, Serbia. <b>Miloš Milosavljević</b>, Professor, University of Belgrade, Serbia. <i>Title: The Evolution of Influencer Credibility Dimensions in the Skincare Industry: A Systematic Literature Review (2020–2026).</i></p> <p>4. <b>Hande Bilsel</b>, Associate Professor, Bahçeşehir University, Türkiye. <i>Title: A New Frontier in Marketing Communications: Advertainment.</i></p>	<p><i>Beliefs Regarding Technology, Teachers' Technological Skills, or Available Sources of Support?</i></p> <p>5. <b>Ivan De Boi</b>, Postdoctoral Researcher, University of Antwerp, Belgium. <b>Rudi Penne</b>, Full Professor, University of Antwerp, Belgium. <i>Title: Beyond Euclidean: A Comprehensive Review of Distance Metrics and Dissimilarity Measures in Contemporary Machine Learning.</i></p>
<p><b>12:30-14:00 Session 8</b></p>		
<p><b>Session 8a</b> <b>Moderator: Reza Hamzaee</b>, BOG-Distinguished Professor Emeritus, Missouri Western State University &amp; President/CEO, RMH Econometrics/Bus Management Consultants, Inc., RMD Hamzaee Econometrics International Consultants, LLC., USA.</p>	<p><b>Session 8b</b> <b>Moderator: Saikat Banerjee</b>, Professor, Indian Institute of Foreign Trade, Kolkata Campus, India.</p>	<p><b>Session 8c</b> <b>Moderator: Shams Alyusof</b>, Associate Professor, Imam Mohammad Ibn Saud Islamic University, Saudi Arabia.</p>
<p>1. <b>Martin O'Brien</b>, Professor, University of Wollongong, Australia. <i>Title: Private Versus Public Sector Wage Leadership: Incorporating the Role of Asymmetry.</i></p> <p>2. <b>Philipp Ehrl</b>, Professor, Fundação Getulio Vargas (FGV), EPPG, Brazil. <b>Rafael Ribas</b>, Professor, Boise State University, USA. <i>Title: The Unequal Impact of Public Mistrust in Labor Markets: Evidence from an Environmental Disaster.</i></p> <p>3. <b>Erica Patente Nascimento</b>, Professor, State University of Northern Paraná (UENP), Brazil. <b>Eric Noventa de Souza</b>, PhD Student, State University of</p>	<p>1. <b>Anica Hunjet</b>, Vice-Rector for Scientific and Artistic Work and International Cooperation, University North, Croatia. <b>Boris Jurić</b>, EPEU d.o.o., Croatia. <b>Dijana Vuković</b>, Associate Professor, University North, Croatia. <i>Title: Towards a Model of Sustainable Management of the Adriatic Islands: A Macromarketing Approach and the Role of Stakeholders.</i></p> <p>2. <b>Juan Carlos Chica Mesa</b>, Professor &amp; Dean of the Faculty of Administration, National University of Colombia, Colombia. <b>Mayerli Vanessa Martinez Castaño</b>, Student, National University of Colombia, Colombia. <b>Dayana Perez Quiceno</b>, Student, National University of Colombia, Colombia. <i>Title: Development of an Archetypal Perception Model Applied to Entertainment Establishments according to the Chinese Zodiac Calendar.</i></p> <p>3. <b>Tamara Bell Boyle</b>, Founder, Organization Hopemore International, USA.</p>	<p>1. <b>Ellina Grigorieva</b>, Professor, Texas Woman's University, USA. <i>Title: Methods of Solving Complex Math Problems.</i></p> <p>2. <b>Long Wang</b>, Professor, Kennesaw State University, USA. <b>Jun Ji</b>, Professor, Kennesaw State University, USA. <i>Title: Construction of Finite Tight Frames via Singular Value Decomposition.</i></p> <p>3. <b>Jinmei Yuan</b>, Professor, Creighton University, USA. <i>Title: The Role of Continuity in Set-Based Thinking: Discovering the Nature of Numbers Taught by the Nine Chapters on Mathematical Art in Ancient China.</i></p> <p>4. <b>Plamen Koev</b>, Professor, San Jose State University, USA. <i>Title: Accurate</i></p>

21<sup>st</sup> Annual International Symposium on Economic Theory, Policy & Applications,  
29-30 June & 1-4 July 2026, Athens, Greece: Abstract Book

<p>Northern Paraná (UENP), Brazil. <b>Marcela Ribeiro De Albuquerque</b>, Professor, State University of Northern Paraná (UENP), Brazil. <b>Leonardo José Oliveira e Silva Rosalem</b>, Professor, State University of Northern Paraná (UENP), Brazil. <i>Title: Heuristics and Bounded Rationality in Behavioral Economics: A Systematic Mapping Study.</i></p> <p>4. <b>Nitya Singh</b>, Associate Professor &amp; Chair, Department of Management, Salisbury University, USA. <i>Title: The Institutional Paradox: Stability, Power, and Change in Emerging Political Economies.</i></p>	<p><i>Title: Utilizing Organizational Development Theory to Critically Look at Distance Learning and Teaching during COVID-19.</i></p> <p>4. <b>Lucky Otame</b>, Lecturer, Bournemouth University, UK. <b>Mehdi Chowdhury</b>, Professor, Bournemouth University, UK. <i>Title: Migration and Remittance Decisions: Evidence from a Recursive Bivariate Probit Model of Bangladeshi Households.</i></p>	<p><i>Computations with Totally Nonnegative Matrices of Any Rank.</i></p>
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**14:00-15:00 Lunch**

**16:30-19:30 Session 9  
Old and New-An Educational Urban Walk**

The urban walk ticket is not included as part of your registration fee. It includes transportation costs and the cost to enter the Parthenon and the other monuments on the Acropolis Hill. The urban walk tour includes the broader area of Athens. Among other sites, it includes: Zappion, Syntagma Square, Temple of Olympian Zeus, Ancient Roman Agora and on Acropolis Hill: the Propylaea, the Temple of Athena Nike, the Erechtheion, and the Parthenon. The program of the tour may be adjusted, if there is a need beyond our control. This is a private event organized by the Athens Institute exclusively for the conference participants.

**20:00-22:00**

**Closing Remarks by Gregory T. Papanikos: “Wine, Words, and Wisdom: An Ancient Athenian Dinner Symposium” followed by an Ancient Athenian Dinner**

**Wednesday 1 July 2026  
An Educational Visit to Selected Islands  
or Nafplio & Mycenae Visit**

**Thursday 2 July 2026  
Visiting the Oracle of Delphi**

**Friday 3 July 2026  
Visiting the Ancient Corinth and Cape Sounion**

**Saturday 4 July 2026  
09:00-10:00 – The Academic Discussion continues in the downtown open agora (close to the Aristotelian Lyceum)**

**A. Zafer Acar**

Dean, Faculty of Applied Sciences, Istanbul Bilgi University, Türkiye

**Pinar Acar**

Head, Department of Human Resources Management, Istanbul  
Medipol University, Türkiye

&

**Selami Yilmazturk**

Graduate Student, Piri Reis University, Türkiye

## **Effects of Organizational Culture and Working Conditions on Job Satisfaction in Hazardous Working Environment: A Quantitative Study in Turkish Shipyards**

The shipbuilding industry constitutes a strategic segment of the global maritime economy, yet it continues to face persistent challenges in sustaining a stable and competent workforce. Shipyards, characterized by hazardous working environments and complex production processes, rely heavily on skilled blue-collar labor whose operational mistakes may result in severe economic, environmental, and safety-related consequences. In this context, high turnover rates become particularly critical, as each departure not only diminishes accumulated expertise but also interrupts organizational learning processes and imposes substantial recruitment and training costs. Despite the sector's dependence on experienced workers, the interplay between organizational culture, working conditions, and job satisfaction has been insufficiently explored in empirical research, especially within developing maritime economies. The limited body of literature tends to concentrate on single-yard case studies, leaving a gap in understanding how organizational and environmental factors jointly shape turnover intentions across different industrial zones.

This study addresses this gap by examining the effects of organizational culture and working conditions on job satisfaction and turnover-related attitudes among shipyard employees. In addition, the study seeks to identify the dominant sources of work motivation and to analyse how job satisfaction varies across worker profiles. The empirical research was conducted in two major shipyard industrial zones in Türkiye, representing the country's most significant shipbuilding clusters. Using a field survey methodology, data were collected from 402 employees through structured questionnaires administered via face-to-face interviews. The dataset was analysed using the Jamovi statistical program to test the proposed hypotheses and uncover the underlying relationships among the constructs.

The findings reveal several noteworthy patterns. First, organizational culture in the surveyed shipyards is predominantly characterised by a clan-oriented structure emphasizing cooperation, loyalty, and interpersonal support. Although such cultural attributes generally contribute to a positive social environment, the study demonstrates that job satisfaction differs substantially between shipyards located in distinct geographic regions. These regional discrepancies suggest that contextual factors—such as management practices, subcontracting structures, or local labor dynamics—may moderate the influence of organizational culture on employee attitudes. Second, gender-based differences emerged as statistically significant, indicating that male and female employees experience the work environment in distinct ways, particularly in relation to satisfaction with safety conditions and interpersonal communication. Third, turnover intention was found to vary across shipyards; however, salary levels and the quality of the workplace social environment consistently appeared as the dominant predictors of dissatisfaction. Workers who expressed concern about low or unstable wages, or who perceived weak collegial relations, reported significantly stronger intentions to quit.

Overall, this research offers one of the most comprehensive examinations of job satisfaction and turnover intention across multiple shipyards in Türkiye, integrating organizational culture and working-condition variables within a unified analytical framework. By highlighting the factors that most strongly influence employee retention in a high-risk industrial context, the study contributes to the literature on maritime human-resource management and offers practical insights for shipyard administrators aiming to reduce turnover and cultivate a more stable, motivated, and satisfied workforce.

**Laura Adler**

Assistant Professor, Yale University, USA

## **When Does Flexibility Matter? How Remote Work and Flexitime Shape Gender Inequality in Time Use**

Recent years have seen a significant rise in remote work, but our understanding of its effect on gender inequality are mixed. This research draws on multiple data sources including the 2017-2018 American Time Use Survey Leave Module as well as surveys and in-depth interviews with both members of employed U.S. couples to examines the interplay between remote work and flexitime in shaping gender inequality at home and work. While both remote work and flexitime have been put forward as strategies for increasing gender equity, we propose that these policies may have unexpected interactions. Our preliminary analysis of the ATUS data show that, among 2,218 employed parents, flexitime increases gender equity but remote work can reverse this effect. Access to flexitime increases mothers' time on paid work and decreases their housework time. Although access to both types of flexibility is most common among highly paid workers, the addition of remote work is associated with a more traditional division of labor than flexitime alone: women who have access to both remote work and flexitime are likely to work fewer hours and spend more time on housework, compared to those with only flexitime. Remote work alone is associated with no benefits for men or women. An ongoing data collection effort involving a large-scale survey (N=1,000) and in-depth interviews (N=100) with both members of employed U.S. couples will examine the mechanisms underlying this pattern and the impact of remote work on women's careers.

**Chekra Allani**

Assistant Professor, Arab Open University – Kuwait, Kuwait

### **From Fairy Tales to Algorithms: AI-Enhanced Bibliotherapy for Mental Health**

In a digital age where mental health challenges are more incrementally recognized, fairy tales and children's literature offer a promising intervention with AI-driven bibliotherapy to support students' emotional well-being. This research explores the capacity of AI in selecting therapeutic texts based on students' emotional needs. It aims to develop a structured educational model for implementing AI-assisted bibliotherapy in schools, supporting a healthy balance between digital tools and traditional reading.

The study employs a survey methodology, targeting teachers in selected Kuwait schools to assess their awareness, perceptions, and challenges regarding the use of literature for mental health support. The collected data is systematically analyzed to identify trends, challenges, and opportunities for AI-enhanced bibliotherapy in educational settings. Based on the findings, data-based recommendations are proposed to guide educators in effectively incorporating AI-assisted reading programs into their curricula.

A sound educational framework is introduced, ensuring the validity of the process and offering a step-by-step guide for integrating AI-powered bibliotherapy into schools. By linking traditional storytelling with cutting-edge technology, this study highlights the paradigm shifting role AI can play in promoting mental resilience and emotional well-being through literature.

**Qasem AlMdallal**

Professor, United Arab Emirates University, UAE

## **Nonlinear Dynamics and Stability of Symmetric Vortex Pairs Around a Circular Cylinder**

The motion of counter-rotating point vortices in the vicinity of a circular cylinder provides a classical model for understanding vortex shedding and wake dynamics behind bluff bodies. In this study, we investigate the nonlinear dynamics of a symmetric vortex pair immersed in a uniform inviscid flow around a circular cylinder. By exploiting the Hamiltonian structure of the governing equations, a comprehensive phase-space analysis is performed. The existence and stability properties of the Föppl equilibrium configurations are examined in detail, together with additional equilibrium states located on the normal axis and at infinity. The analysis reveals the presence of a nilpotent saddle point at infinity whose associated homoclinic trajectories define the boundary of the nonlinear stability region of the Föppl equilibria. Both symmetric and antisymmetric perturbations are considered. While symmetric perturbations generate bounded periodic motions around the equilibrium states, antisymmetric disturbances lead to instability and provide a dynamical mechanism for vortex shedding. Numerical simulations are presented to illustrate the global structure of the phase portrait and the evolution of vortex trajectories under different perturbations. The results provide new insight into vortex-cylinder interactions and contribute to a deeper understanding of wake instability and vortex shedding phenomena in bluff-body flows.

**Mohammed Alshbool**

Associate Professor, Zayed University, UAE

## **Modification of Bernstein Operational Matrices for Numerical Problem Solving in Applied Mathematics and Engineering**

The goal of the paper was to create an accurate approximation of the Bernstein operational matrices and demonstrate how to utilize it to solve problems in applied sciences. In order to anticipate the output based on a function for a new, unknown input, regression techniques are advised. The Bernstein polynomials approach can be used to deal with difficult problems in Engineering, Mathematics, and applied sciences. We examine the methodology. The outcomes show how the approach can be used as a tool to statistically tackle these issues.

**Stanislav Anatolyev**

Associate Professor, CERGE-EI, Czech Republic

&

**Maksim Smirnov**

PhD Student, CERGE-EI, Czech Republic

## **Asymptotics of Large-Dimensional Projection Matrices**

We characterize the joint asymptotic behavior of diagonal and off-diagonal elements of projection matrices, whose underlying dimensionality (or rank) is asymptotically proportional to the sample size, with the aspect ratio in  $(0,1)$ , under the rotated i.i.d. assumption. The rate of convergence is a square root of the sample size, and the limiting distribution is multivariate centered Gaussian. The formulas for the asymptotic variances and covariances are expressed as functions of the aspect ratio and moments of data. The instrumental tools in deriving the asymptotic results are the Woodbury matrix identity, a central limit theorem for quadratic forms, and elements of the random matrix theory such as the Marchenko-Pastur law.

**Saikat Banerjee**

Professor, Indian Institute of Foreign Trade, Kolkata Campus, India  
&

**Akanksha Kumari**

Researcher, Indian Institute of Foreign Trade, Kolkata Campus, India

## **Impact of B-school Director Brand on B-school Performance: An Empirical Investigation**

Management education is one of the most preferred choices of higher education. The demand for the course has continued to increase over the decades. According to AICTE (All India Council for Technical Education) data, management education in India accounts for over 50% of the total postgraduate student intake, surpassing all other postgraduate courses combined, highlighting the significance of management programs in the Indian higher education industry.

Business Schools (B-schools) that primarily focus on management education operate more like industries, treating students as customers and marketing degrees as a service. As the significance of B-schools and their globalization grows, the roles of directors become increasingly vital (Wilkins and Huisman, 2012). The success and competitiveness of a B-school largely hinge on its director, who is the key decision-maker. They are the heads of the institution who supervise the day-to-day activities of the institution, much like CEOs do in an organization. In B-school settings, a director's effectiveness depends on the relationships they have with followers and how they are perceived (Ruben and Gigliotti, 2016).

Since B-school directors occupy a key role, their personal branding can significantly impact the B-school's brand success. Previous studies have explored the importance of management education, the role of B-schools as a brand (Das et al., 2021), the influence of B-schools on society (Cornuel, 2005), and the impact of perceived service quality on brand performance (Sultan and Wong, 2018). Literature has also examined narcissism as a director's personality trait (Khoo et al., 2024), compensation (Elmagrhi and Ntim, 2024; Lucey et al., 2022), and leadership style (Brabazon, 2021; Heffernan et al., 2021). However, to the best of our knowledge, a key area – directors' branding and its potential effects – remains underexplored, despite their influential role (Brabazon, 2021; Heffernan et al., 2021).

Therefore, this study aims to understand the traits of a director who can drive the B-school's success. This involves exploring the elements of the B-School director's personal brand and offering useful insights for promoters and marketers. By identifying the qualities of a director who

can foster the B-School's growth, this study aims to guide strategies for development and expansion. Furthermore, analyzing how a successful B-school can shape stakeholder perceptions of the brand will provide a holistic view of its significance and influence.

The study is based on a primary survey. A structured questionnaire is distributed to students pursuing BBA and MBA degrees, as well as to alumni of Business Schools. Furthermore, structural equation modeling (SEM) is employed to elucidate the relationship between the variables examined in this study.

The Preliminary findings suggest that the B-school director's brand appeal and social capital have a significant impact on the B-school's overall brand performance. Which, in turn, fosters brand trust and brand advocacy. These results could assist the B-school's management and board in choosing a suitable director capable of efficiently managing the institution and expanding its reach both nationally and internationally.

**Maja Basic**

Senior Research Fellow, Institute of Public Finance, Croatia

**Matea Cvjetkovic**

Research Associate, Institute of Public Finance, Croatia

&

**Bojan Moric Milovanovic**

Professor, Libertas International University, Croatia

## **Understanding Transparency-Oriented Innovation: The Combined Effect of Funding Sources and Actor-Led Initiatives in the Public Sector**

Transparency diminishes corruption by developing trust between government entities and citizens; consequently, allowing greater scrutiny and critique, but leading to higher efficiency and effectiveness of the public sector. This paper used a structured questionnaire survey conducted on 387 public sector respondents to explore the relationship between funding sources and initiators of a transparency-oriented innovation. Logistic linear regression was used to test the hypotheses on two sub-samples: (1) local self-government units and (2) state-owned enterprises. The findings suggest that transparency-oriented innovation has a higher odd of occurring when it is initiated by citizens and innovation in other public organisations, and financed by proprietary funds of government entities or state-owned enterprises. In case a transparency-oriented innovation is financed by a government entity, it has a higher odd of occurring if the initiator is a manager, citizen, technology or innovation in other public organisations. On the other hand, the EU financed transparency-oriented innovation in government entities has a greater probability of occurring if the initiator is a political leader. These results are useful for governments and managers to understand the main factors affecting the transparency-oriented innovation, leading to more informed policy choices that support the development anti-corruption and transparency-oriented policies.

**Hande Bilsel**

Associate Professor, Bahçeşehir University, Türkiye

&

**Murat Copcu**

Assistant Professor, Bahçeşehir University, Türkiye

## **From Monsters to Mascots: Anthropomorphized Germs in Hygiene Advertising**

This paper examines how anthropomorphized germs in hygiene advertising construct cultural meanings of risk, cleanliness, and responsible consumption. Focusing on a corpus of contemporary television and digital commercials for soaps, disinfectants, and household cleaners, it explores how “germ characters” mediate between invisible microbiological threats and the everyday practices of audiences. While germs are, scientifically, imperceptible agents, advertising repeatedly visualizes them as tiny monsters, mischievous blobs, or even playful companions who invade bodies and homes. These figures invite viewers to imagine, fear, and control contamination in highly stylized ways, and in doing so, they naturalize particular understandings of health, hygiene, and the “good” consumer.

Theoretically, the paper draws on semiotics and Roland Barthes’s notion of myth to analyze how germs are turned into legible, emotionally charged signs. It also engages with work on anthropomorphism and character branding to show how advertisers borrow techniques from animation and children’s media to make risk feel tangible and narratable. Methodologically, the study employs qualitative visual and textual analysis of selected campaigns from different brands and markets, paying attention to character design, color, gesture, facial expression, voice-over, and the staging of contagion and cure. The analysis traces how the same basic germ figures are adapted across platforms (television spots, YouTube pre-rolls, social-media shorts), adjusting tempo, humor, and visual density to different screens and attention economies.

The paper argues that anthropomorphized germs operate as powerful communication devices that simplify microbiological complexity while reinforcing classed and gendered divisions of domestic labor and hygiene responsibility. Germ villains often target mothers, wives, and female caregivers, positioning them as guardians of the clean home and healthy family, while implying that proper consumption of branded products is the main route to safety. At the same time, by making germs cute or humorous, some campaigns normalize constant low-level anxiety and routinised cleaning as everyday entertainment.

By reading these campaigns as cultural texts rather than neutral health information, the study contributes to debates in advertising and marketing communication, media and cultural studies, and risk and health communication. It shows how commercial storytelling about germs both echoes and reshapes public health discourses, especially after the COVID-19 pandemic. Finally, the paper suggests how critical semiotic insights can inform more reflexive creative strategies for hygiene and cleanliness advertising, opening space for representations of care and responsibility that do not rely solely on fear, disgust, or gendered guilt.

**Tamara Bell Boyle**

Founder, Organization Hopemore International, USA

## **Utilizing Organizational Development Theory to Critically Look at Distance Learning and Teaching during COVID-19**

On April 17, 2020, approximately one month after many governments implemented a lockdown, “many teachers received a couple of days of training before being asked to overhaul nearly every facet of their job. The lucky ones had a couple weeks” (Adams, 2020). Furthermore, on September 10, 2020, after many United States (U.S.) public schools returned from summer break, the U.S. discovered that “our public education system was not built, nor prepared, to cope with a situation like this [virtual teaching during the Covid-19 lockdown]” (García & Weiss, 2020). García & Weiss were describing how schools moved from teaching in a face-to-face environment to teaching virtual (i.e., asynchronous and synchronous) environment. García & Weiss (2020) affirmed that “we [the U.S.] lack[ed] the structures to sustain effective teaching and learning during the shutdown and to provide the safety net supports that many children receive in school”. However, if one critically reviews an Organizational Development Theory called Organizational Change (OC) it will clearly illustrate the importance of time and planning when an organization is making changes to their structure, technology, and processes. The education system (i.e., organizations) shifted from in-person to online—changing their structure, technology, and process. However, did the organization complete a strategic organizational change? Holt, Love, & Jawahar Nesan, (2000) discuss how a successful change has three major phases, in which the first major phase is the preparation phase. Kotter (2007) argues, and has argued for decades, that for a successful change there are eight steps, which includes a preparation phase, an organization must take. Furthermore, Kotter (2007) argues that a successful change process usually requires an extensive amount of time – which the U.S. and other schools around the world did not have. Therefore, this paper will persuasively make three arguments: (1) For most education institutions, moving from a face-to-face learning environment to a distance learning and teaching environment during the COVID-19 pandemic quarantine was an “emergency mandatory change” (EMC) mandated by governments, (2) Since most education institutions lacked time to prepare and properly implement an organization change (i.e., to move from face-to-face to distance learning and teaching), during the COVID-19 pandemic (i.e., March of 2020 until the end of the academic year of

2020-2021); therefore, most education institutions and instructors, unfortunately, were set-up to fail, and (3) If an education institution did not utilize their down-time (e.g., summer break of 2020) to create a proper plan (i.e., at least, providing training to instructors and students; create a teaching, learning, and technology (TLT) center to provide support to the instructors and students; set accountability standards for education institutions and students; and create a clear learning and work schedule for instructors and students) for continuing distance learning, for the academic school year of 2020-2021, the instructors and students were set-up to fail.

**Juan Carlos Chica Mesa**

Professor & Dean of the Faculty of Administration, National University  
of Colombia, Colombia

**Mayerli Vanessa Martinez Castaño**

Student, National University of Colombia, Colombia

&

**Dayana Perez Quiceno**

Student, National University of Colombia, Colombia

## **Development of an Archetypal Perception Model Applied to Entertainment Establishments according to the Chinese Zodiac Calendar**

In today's experiential marketing landscape, consumer perception is a key factor for the survival and success of any service establishment. These types of businesses compete not only through their offerings but also by building experiences that strengthen brand identity and positioning. In this sense, understanding how consumers perceive and attribute meaning is essential for designing loyalty strategies that not only ensure customer return but also positive recommendations and the building of strong relationships.

Traditionally, the evaluation of this perception has been approached using standardized quantitative instruments such as SERVQUAL, which, according to Numpaque-Pacabaque and Rocha-Buelvas (2016), is an instrument that allows for the evaluation of service quality by comparing what the user expects versus what they perceive; and qualitative studies of consumer psychology. While these approaches are valuable, they often result in superficial interpretations such as "good service" or "pleasant atmosphere" that fail to capture the complexity of each establishment's identity. This complexity, highlighted in previous studies such as Bitner's (1992) on servicescapes and Parasuraman, Zeithaml, and Berry's (1988) work, argues that the service quality model is based on the subjective, multidimensional, and emotional nature of human perception.

This reveals a gap between the need for an innovative interpretive framework, rich in the emotional and symbolic nuances of the consumer experience, and traditional methodologies, which fail to capture the symbolic, emotional, and archetypal dimension underlying consumer perception in entertainment spaces. Therefore, this study proposes to transcend conventional metrics to classify the perceptual essence of each establishment in a deeper, more coherent, and more representative way.

Along these lines, Holbrook and Hirschman (1982) introduce a new perspective, arguing that consumption is not only a rational evaluation process but also includes symbolic and emotional factors involving fantasies, feelings, and cultural meanings. In this way, consumer perception is understood as a holistic experience that goes beyond metrics and quantitative evaluations, and is built upon subjective and symbolic elements. This approach is especially useful for understanding how consumers identify positive and negative aspects in entertainment spaces by relating their experiences to cultural meanings and symbols, such as the archetypes of the Chinese zodiac, which could provide a deeper perspective on the essence of each establishment.

Below is a list of positive and negative attributes associated with the perception of service establishments and their symbolic correspondence with the animals of the Chinese zodiac.

Chinese Zodiac Animal	Positive Attributes/Negative Attributes
Rat	Resourceful, adaptable, hardworking Calculating, distrustful, opportunistic
Ox	Diligent, reliable, honest Rigid, conservative, slow
Tiger	Passionate, brave, charismatic Competitive, arrogant, impulsive
Rabbit	Gentle, compassionate, calm Indecisive, insecure, distrustful
Dragon	Intelligent, ambitious, charismatic Arrogant, selfish, impatient
Snake	Wise, intuitive, calm Jealous, manipulative, distant
Horse	Energetic, independent, enthusiastic Temperamental, stubborn, impulsive
Sheep	Compassionate, creative, patient Indecisive, weak, dependent
Monkey	

Resourceful, versatile, curious  
Manipulative, arrogant, unstable  
Rooster  
Organized, observant, responsible  
Proud, negative, rigid  
Dog  
Loyal, honest, protective  
Pessimistic, stubborn, anxious  
Pig  
Sociable, sincere, generous  
Susceptible, materialistic, naive

Main question: Based on the above, the following problem arises: Is it possible to use the Chinese zodiac to propose a methodology for analyzing the perception of services based on visual stimuli?

**Antonio Cutanda**

Professor, University of Valencia, Spain

&

**Juan Alberto Sanchis-Llopis**

Professor, University of Valencia, Spain

## **Heterogeneity in the Marginal Propensity to Consume out of Wealth: Evidence from Spanish Panel Data**

This paper estimates the marginal propensity to consume out of wealth using Spanish panel data from the Survey on Household Finances from 2002 to 2017. This period comprises an entire economic cycle for the Spanish economy, including the Great Recession and the housing bubble. We estimate marginal propensities to consume out of wealth about 4%, which aligns with the values obtained for comparable economies. Further, our panel data estimates indicate that ignoring unobserved individual fixed effects might bias the estimates.

Additionally, we find that the estimated parameters vary across the income and wealth distributions for the full sample, confirming the concave shape of the consumption function in the Spanish case. We do not identify any statistically significant effect of either financial or liquid wealth on non-durable consumption, and we confirm that hand-to-mouth households display a higher marginal propensity to consume, which increases with income. Finally, the financial crisis exerted a sizeable and negative impact on the marginal propensity to consume out of wealth.

**Matea Cvjetkovic**

Research Associate, Institute of Public Finance, Croatia

**Maja Basic**

Senior Research Fellow, Institute of Public Finance, Croatia

&

**Jasmina Masovic**

Research Associate, Institute of Public Finance, Croatia

## **Strategic Networking and Public Sector Innovation: A Cross-Sector Perspective**

Strategic networking and entrepreneurial orientation are well-defined drivers of private sector performance. Nevertheless, their application to public sector organisations remains underexplored, particularly in post-transition EU member states where local governments operate under structural constraints that differ from private market settings. This paper draws on a research programme that incorporates empirical evidence from the private and public sectors in Croatia and Southeast Europe, combining studies on small and medium-sized enterprises with original survey-based research on local self-government units (cities and municipalities) and their majority-owned enterprises. Instead of treating the two sectors in isolation, the programme uses private sector findings and compares the relevant insights with the public sector context, taking into account the institutional, regulatory, and accountability differences that shape how organisations in each sector network, innovate, and perform. By organizing the results of the studies conducted in both sectors, the paper identifies best practices and targeted policy recommendations for local governments aiming to develop sustainable innovation capacity. The findings are relevant for governments, managers, and policymakers dealing with challenges of building innovative public organisations in resource-constrained and institutionally complex environments.

**Ivan De Boi**

Postdoctoral Researcher, University of Antwerp, Belgium

&

**Rudi Penne**

Full Professor, University of Antwerp, Belgium

## **Beyond Euclidean: A Comprehensive Review of Distance Metrics and Dissimilarity Measures in Contemporary Machine Learning**

This paper presents a comprehensive review of distance metrics and dissimilarity measures fundamental to the field of Machine Learning (ML). While ubiquitous algorithms like k-nearest neighbors, clustering methods, and support vector machines heavily rely on measuring similarity, the default choice of the Euclidean distance often obscures a deeper, application-specific consideration of data geometry. We aim to provide an inspiring and broadening perspective across diverse data types and domains. The review moves from classical norms (Euclidean, Manhattan, Minkowski, Chebyshev) to specialized metrics critical in modern ML: Hamming and Jaccard distances for discrete and set data, the Mahalanobis distance, essential for covariance-aware modeling, Cosine Similarity, linking classical vector geometry to Natural Language Processing embeddings, Dynamic Time Warping for time series, Chamfer distance for point clouds, geodesic distances for manifold learning, abstract measures such as the Kullback–Leibler Divergence for probability distributions, and the Bottleneck and Wasserstein distances used in Topological Data Analysis.

Beyond a simple catalog, we address critical theoretical implications in the ML pipeline: 1) Examining the relationship between a distance metric and the existence of a positive definite kernel. 2) Distance Metric Learning, a subfield dedicated to learning optimal metrics to maximize performance in similarity-based algorithms. 3) Latent Space Fidelity, analyzing what distances in a low-dimensional latent space (e.g., in Autoencoders or VAEs) reveal about semantic separation in the high-dimensional observed space. 4) Geometric Transformations, exploring the impact of explicit feature mappings (like the Veronese map in algebraic geometry) on the induced metric, emphasizing that the effective distance is often measured in a transformed feature space. 5) Identifiability of distances (uniqueness under reparametrizations).

Ultimately, this paper serves as an invitation for researchers and practitioners to critically evaluate the underlying geometric assumptions in their models, arguing that the selection of the appropriate distance

metric is, in fact, the explicit declaration of which data invariances and variations are deemed semantically meaningful.

**Dulanjalee Devage Dona**

Assistant Professor, University of Wisconsin-Whitewater, USA

## **Assessing Accuracy and Reliability of AI-Generated Statistical Interpretations**

Artificial intelligence (AI) tools are rapidly used in both academic research and industry applications. These tools can generate text, images, videos and assist with analytical tasks such as data processing and interpretation with the recent improvement of generative AI. In statistical data analysis, AI tools are commonly used in data preprocessing, exploratory analysis, statistical modeling, and interpreting results. These technologies enhance accessibility and productivity; however, it is uncertain that AI-generated statistical explanations will be precise. As students, academics, and analysts use AI more often, it is important to assess how well these tools interpret statistical results in comparison to human analysis. Therefore, the main objective of this study is to assess the effectiveness and reliability of AI-guided statistical analysis. The study focuses on evaluating how well AI tools can guide the selection and execution of statistical techniques as well as how well they interpret the outcomes. Moreover, it evaluates how clear and complete the explanations produced by AI are. It also evaluates how consistently these tools use important statistical methods such as regression modeling, correlation analysis, and hypothesis testing. In addition, the study explores potential errors or misinterpretations that could occur during both the analysis and interpretation phases.

Two real-world datasets were used to conduct this evaluation. The first dataset is the Kaggle Student Performance dataset, which includes variables related to students' academic performance and factors such as study time, demographic characteristics, and family background. The second dataset is a health-related dataset that contains information on patient characteristics and various health indicators. These datasets were selected to represent education and healthcare where statistical methods are frequently applied.

Standard statistical methods like regression modeling, correlation analysis, descriptive statistics, and hypothesis testing were used to examine both datasets. The statistical results were first interpreted manually using standard statistical procedures. The same outputs were then provided to AI systems to generate automated explanations. These AI-generated interpretations were compared with the human-generated interpretations. The comparison mainly focused on the quality of AI-generated interpretations and how effectively AI systems could follow

the appropriate statistical analysis procedures based on the information provided in the datasets. The analysis focused on how well the AI applied statistical techniques and interpreted results such as p-values. It also examined how clearly the AI explained relationships between variables and the assumptions of regression models. Preliminary results indicate that AI tools can generate quick and generally reasonable statistical interpretations. However, the precision and clarity of the input prompts have a significant impact on the quality of these outputs. When applying statistical techniques and interpreting results, AI-generated explanations could be inaccurate if the input information is unclear and incomplete. The study concludes that AI can effectively support statistical analysis but should not replace careful human evaluation. Properly structured prompts and critical oversight are necessary to ensure reliable AI-assisted statistical interpretations. These findings provide practical guidance for researchers, educators, and data practitioners, and emphasize the importance of using AI responsibly in both statistics education and real-world data analysis.

**Michael Dorff**

Professor & Chair, Department of Mathematics, Brigham Young  
University, USA

## **AI and the Teaching of University-Level Mathematics**

AI has impacted the way mathematics is learned. University students can use AI to obtain correct answers for almost every computational mathematics problem, including providing the necessary steps to derive those answers. AI can also write out correct proofs for many abstract theoretical mathematics problems. If AI cannot prove a result today, it will be able to prove that result in a year or two.

What does this mean for the teaching of university-level mathematics? Some instructors tell students not to use AI at all in their mathematics courses. Other instructors let students use AI under certain conditions. And then others incorporate AI into their teaching. Outside academia, employers are telling instructors to train students to use AI so they will be better prepared for the future.

How should mathematics instructors proceed with all of this? Come to this talk to hear, learn, and discuss the topic of AI and the teaching of university-level mathematics. The speaker is a member of the U.S. National Academy of Sciences Mathematical Sciences Education Board, a member of the group writing a White Paper on AI and mathematics teaching for the American Mathematical Society's Committee on Education, and a former President of the Mathematical Association of America.

**Philipp Ehrl**

Professor, Fundação Getulio Vargas (FGV), EPPG, Brazil

&

**Rafael Ribas**

Professor, Boise State University, USA

## **The Unequal Impact of Public Mistrust in Labor Markets: Evidence from an Environmental Disaster**

This paper examines the effects of exogenous negative information shocks on labor markets in Brazil. The shocks were caused by the drastic damages from the tailings dam failures in Mariana and Brumadinho in 2015 and 2019. Both events are among the worst mining accidents in Brazilian history and received major attention in the public. We estimate difference-in-difference (DiD) regressions using matched employer-employee data, the georeferenced localization of active, dangerous industrial tailings dams, and detailed geographical information. Our identification strategy exploits that upstream municipalities would be unaffected whereas residents along the ottobasin through which the hazardous residuals would flow suffer the negative consequences of tailings dam failure. To guide the interpretation of our results, we develop a spatial equilibrium labor market model that predicts the theoretical effects of a change in amenity values caused by higher risk perception in downstream municipalities. We find that, in line with our theoretical predictions, high-skill workers in downstream municipalities experience gradually higher wages over time that range between 9\% and 13\%. The size of these estimated wage effects decreases when we broaden the sample's bandwidth including municipalities from either 60, 70, 80 or a maximum of 90 km distance to the closest tailings dams. For low-skill workers in contrast we do not find any significant wage effects throughout the observation period. Regarding employment, the information shock gradually reduces the number of high-skill workers over time. Particularly small and medium sized firms suffer employment losses in downstream municipalities. In firms with 20 to 100 employees the drop is as large as 18% in the fourth post-disaster year. The employment changes among low skill workers are insignificant, just as in case of the wage regressions. Importantly, virtually all of the numerous DiD wage and employment estimations show no differential pre-trends lending support for our identification assumption. We interpret the evidence as being consistent with a negative supply shock of high-skilled workers caused by the perceived fall in amenities. The low-skill labor supply curve in Brazil seems to be elastic while the one

for high skilled is inelastic. Workers in less skilled jobs thus have little bargaining power to push for raises and have a lower probability of finding a new job in another (less risky) municipality. In line with this interpretation, we see that, among the high-skilled men, managers, and white-skinned workers who typically have more bargaining power experience larger wage gains.

**Skander Esseghaier**

Associate Professor, Mohammed VI Polytechnic University, Morocco

## **The Rational Effect of Expiration Dates on Sales and Consumption: Impact on the Value Chain**

The expiration date for a perishable product determines the maximum validity period from its production date. Though this fixed maximum validity period is usually known - or can be learned by - shoppers, the actual remaining days of validity of the units available on the shelf at any given store visit is uncertain. This is because the actual remaining days of validity of the product in a given store visit depends - among other things - on the retailer's shelf replenishment actions which are unknown to shoppers. Prior to the store visit, shoppers are therefore uncertain about the remaining days of validity of the product they would find on the shelves. Only upon arriving at the store does the shopper observe the remaining days of validity of the product. As the shopper's perception of the product's gross value at the time purchase is determined by the remaining days of validity, the product's perceived value would vary from visit to visit. In this paper we investigate how the expiration date set by the manufacturer impacts the degree of fluctuation in product's perceived value across store visits and how this, in turn, impacts consumers' shopping behavior. Specifically, how frequently should they visit the store, and how much of the product should they buy when they get there? Would this rational shopping behavior differ under longer versus shorter expiration dates? We examine the effect of the product expiration date on the value chain, focusing on pricing, retail shelves replenishment policy, consumption and product waste.

**Candida Ferreira**

Professor, University of Lisbon, Portugal

## **The Impact of Financial Integration on Economic Growth: A Global Analysis Using Panel Data**

This study contributes to the discussion about the impact of financial integration on economic growth by analysing an unbalanced panel dataset that covers 193 countries from 1960 to 2021. Data on financial integration were sourced from the Global Financial Development Database, while control variables representing macroeconomic conditions were obtained from the World Development Indicators. The findings from panel estimations confirm the important role of macroeconomic conditions and demonstrate that financial integration significantly contributes to economic growth; however, the effects reported depend heavily on the measures used to represent financial integration. Specifically, the results show a positive impact of the indicators measuring the access to and depth of financial institutions and markets to per capita Gross Domestic Product (GDP) growth. In contrast, higher bank concentration and increased bank efficiency – measured by the bank lending-deposit spread as well as the bank cost-to-income ratio – are negatively related to economic growth. Additionally, the study presents mixed results regarding financial stability indicators. While an increase in liquid assets relative to deposits and short-term funding is associated with a negative impact on economic growth, improvements in financial stability – measured by the bank Z-score and the ratio of bank credit to bank deposits – significantly contribute to foster per capita GDP growth. Based on these findings, the paper outlines some implications and recommendations related to financial integration policies.

**Susana Garrido**

Associate Professor, University of Coimbra, Portugal

**Maria Bernardo**

MSc Student, University of Coimbra, Portugal

&

**Carmina Nunes**

Adjunct Professor, Instituto Politécnico de Setúbal, Life Quality  
Research Center, GOVCOPP, Portugal

## **Unlocking Circular Economy Potential in the Agro-Industrial Sector: Evidence from Case Studies**

This study aims to analyse the state of the art of the agro-industrial sector in Portugal regarding the implementation of circular practices. It explores the types of circular practices adopted, as well as the barriers and challenges faced by companies. The research focuses on the Circular Economy (CE) as a crucial strategy for mitigating environmental impacts and promoting the efficient use of resources.

The theoretical foundation is supported by a comprehensive literature review covering Circular Business Models and the valorisation of agro-industrial waste. The empirical methodology relies on a qualitative approach based on multiple case studies developed with sustainable and circular Portuguese brands within the agro-industrial sector. Through an integrated analysis of these qualitative case studies, the study aims to identify the circular practices implemented by companies in the sector, along with the main barriers and opportunities associated with their adoption.

A key outcome is the identification of critical success factors that should guide the effective implementation of circular practices in the agro-industrial sector. The final investigation will present actionable results and recommendations relevant to entrepreneurs and policymakers. This research is particularly important for addressing the limitations of the linear economy model, focusing specifically on the Portuguese agro-industrial sector, which holds significant economic weight. By promoting circular economy thinking, the study supports the transition toward sustainability, helping companies reduce waste and emissions while creating sustainable value aligned with economic, social, and environmental objectives.

The originality of this research lies in its sector- and country-specific scope, addressing a clear gap in the literature by analysing the implementation of Circular Economy practices within the Portuguese agro-industrial sector—an area of high economic relevance yet limited

empirical examination. It provides a holistic contribution by combining the identification of circular practices with an analysis of the barriers, opportunities, and particularly the critical success factors that shape circular implementation. Its empirical value is strengthened through multiple qualitative case studies involving sustainable and circular Portuguese brands, offering contextualised and comparative insights.

**Marvin E. Gonzalez**

Associate Professor, College of Charleston, USA

## **Analysis of the Food Supply Chain: Difficulties, Challenges and Solutions in North Macedonia**

This study analyzes the main challenges affecting the food supply chain in North Macedonia, with a focus on transportation efficiency, stakeholder collaboration, information technology adoption, sustainability practices, and quality management. Efficient food supply chains are essential for maintaining product quality, ensuring food security, and supporting economic development. However, logistics systems in developing and transition economies often face structural limitations that reduce performance and reliability. The objective of this research is to identify the primary inefficiencies within North Macedonia's food logistics network and propose practical strategies that improve supply chain coordination, strengthen logistics operations, and enhance the competitiveness of the national food system.

The study uses a mixed-method research design that combines primary and secondary data to provide a comprehensive analysis of the country's food supply chain environment. Primary data was collected through a structured survey distributed among key stakeholders, including logistics providers, transportation companies, agricultural producers, and other actors involved in food distribution. The survey instrument was developed using insights from supply chain and logistics literature and was adapted to the operational context of North Macedonia. To ensure cultural accuracy and improve response quality, the questionnaire was translated into Macedonian by a native collaborator and offered in both English and Macedonian. Secondary data was obtained from government reports, academic literature, and industry studies, allowing benchmarking of national logistics practices against regional and global standards.

The findings reveal several challenges that affect the performance and reliability of the food supply chain. Transportation inefficiencies represent a major constraint, leading to higher logistics costs and reduced delivery reliability. Limited collaboration among stakeholders also weakens coordination across production, distribution, and retail stages. The research identifies gaps in digital infrastructure and information systems that restrict data sharing, traceability, and real-time decision making. Quality management practices remain inconsistent across organizations, contributing to variability in product quality, weak food safety protocols, and limited traceability mechanisms.

Sustainability practices are also uneven across the sector, reflecting constraints in resources, training, and institutional support. In addition, the study identifies barriers to technology adoption, including cybersecurity concerns and a shortage of skilled professionals capable of managing digital logistics systems.

Based on these findings, the study proposes several recommendations to improve supply chain performance. These include establishing standardized quality metrics, strengthening collaboration among supply chain stakeholders, and investing in digital infrastructure that supports traceability and information sharing. The research also encourages the adoption of sustainable agricultural and logistics practices that improve resource efficiency and reduce environmental impact.

Although the study focuses on North Macedonia, which may limit the generalizability of the findings, it provides important insights into the challenges faced by emerging logistics systems. The results offer practical guidance for policymakers and industry stakeholders seeking to improve logistics efficiency, strengthen supply chain coordination, and enhance the resilience of the food distribution network. Overall, the study contributes to the literature on food supply chain management by presenting an in-depth analysis of logistics challenges in North Macedonia and proposing strategies that support the development of a more efficient, sustainable, and competitive food supply chain.

**Gil Greenstein**

Senior Lecturer, Head of M.Sc. Program, Holon Institute of Technology  
(H.I.T), Israel

**Integration between a Multicriteria Decision Making  
(MCDM) Method and Designing of AI Based Decision  
Support Systems (DSS)**

This Research deals with the principle of Multi-Criteria-Decision-Making (MCDM). The principle of MCDM was addressed by practitioners during Decision-Making processes.

In fact, the framework and structure of Decision Support Systems (DSS) originally was set decades ago to ease the decision-making processes in semi-structured decision scenarios (when the decision rule could not be fully automated). In the last years, the improvement of generative Artificial Intelligence (AI) enables us to deal with issues that in the past were addressed by human decision-making processes.

In this research it is shown how implementation processes of Decision Support Systems (DSS) try to manage one of the issues of bounded rationality: the inability to weigh tangible and intangible criteria of utility to a one-dimensional utility function. Since human considerations are limited in unstructured situations, this research portrays methods to ease the calculation of ranking order of human preferences.

The current research tries to illuminate how to integrate the principle of MCDM into a comprehensive method for analysis of an analytical model which instructs how to design a DSS properly in the AI era. The purpose of this research is to develop and show a Meta-Model for processes of Analysis and Design of DSS. This Meta-Model should integrate between DSS, Usage of Gen. AI tools and decision. The implementation of this Meta-model should bridge the Gap that prevents us from making automatic (structured) decisions. The Meta-Model portrays the integration between generative AI tools and The Ranking order of Untangible utility consideration. The Meta-Model will try to clarify the following issues:

1. In which stages, during the implementation stages of DSS, generative AI tools should be integrated by us in the modeling of DSS.
2. What could be the added value of those AI tools (in comparison to an exclusive usage of human decision-making).

In summary, the modeling of Integration of generative could lead us to better understanding of knowing-how to address scenarios of uncertainty and conflicts between contradictory purposes and goals, while we design AI based decision support systems.

**Ellina Grigorieva**

Professor, Texas Woman's University, USA

## **Methods of Solving Complex Math Problems**

This presentation explores effective methods for expanding mathematics learning beyond the mechanical application of standard formulas and developing genuine abstract and original thinking. Based on the author's book series "Methods for Solving...", published by Birkhauser-Springer Nature, the presentation will focus on methods for engaging students in solving complex mathematical problems that require creative synthesis of ideas from various areas of mathematics, rather than relying on standard, predetermined solution paths. The goal is to provide teachers with tools to better understand and appreciate the creative potential inherent in solving mathematical problems.

Participants will learn:

- Select and combine complex problems: Include complex, multifaceted problems, often taken from high-level mathematics competitions, that stimulate mental activity and avoid routine algorithmic approaches.
- Encourage multiple perspectives: Help students explore different approaches to solving the same problem by illustrating how mathematical concepts are closely related (e.g., the relationship between algebra, geometry, and number theory).
- Develop intuition and proofreading skills: Create a supportive, non-intimidating classroom environment that encourages the combined use of deductive reasoning and mathematical intuition, including an emphasis on rigorous proof construction.

**Reza Hamzaee**

BOG-Distinguished Professor Emeritus, Missouri Western State  
University & President/CEO, RMH Econometrics/Bus Management  
Consultants, Inc., RMD Hamzaee Econometrics International  
Consultants, LLC., USA

**Airport-Airline Optimization Methodology via AI -  
Blockchain Application**

Airline sustainability, airport efficiency, passengers' net gain and social optimality would be a matter of a great incorporation of human technical and intellectual talents towards an all winning economic and financial arrangement. That cannot be easily imagined without a system of law and order and a successful implementation of ethical and moral principles and culture. The author has analyzed the efficiency of blockchain technology, AI, and airport-airlines integration, each in separate published studies. In this study, the theoretical focus is on the four essential players - airlines, airports, AI, and blockchain technology for optimization of collective social gain through internalization of the existing externalities among airlines, airports, and passengers. This would best be implemented via an interactive financial strategy, in which airports and airlines would be independently run, but commonly owned, as in a holding-company concept. The stakeholders, airports, airlines, and passengers of all kinds could reduce their costs and optimize their net gains. Through lower airfare, airlines can serve more passengers, who would use more of the two-tier airports' landside and airside services. All that can be effectively operationalized through the advantageous integrated application of AI and blockchain technology within the merged airlines and airports, say, Airportlines. Using this proposed model, one may apply stepwise regression along with linear programming procedures, to explore optimal airport fees and allocation of resources through a collective cost minimization and/or revenue maximization, including those of airlines, airports, and the general customers, through some mandatorily established optimal government regulations.

**Anica Hunjet**

Vice-Rector for Scientific and Artistic Work and International  
Cooperation, University North, Croatia

**Boris Jurič**

EPEU d.o.o., Croatia

&

**Dijana Vuković**

Associate Professor, University North, Croatia

## **Towards a Model of Sustainable Management of the Adriatic Islands: A Macromarketing Approach and the Role of Stakeholders**

The Adriatic islands represent spatially, resource- and demographically sensitive communities whose development requires careful alignment of economic, social and environmental goals. In this context, sustainable development is imposed as the fundamental framework for the future management of island destinations, especially in the areas of tourism, agriculture, fisheries and mariculture. Starting from a macromarketing perspective, this paper analyses the possibilities of establishing a model of sustainable management of the Adriatic islands that would take into account the specificities of island areas, the need to preserve their indigenoussness and the importance of coordinated action of key stakeholders. The paper aims to examine whether sustainable development can be viewed as a development landmark for the Adriatic islands and to what extent macromarketing can contribute to the formation of a more efficient and coherent model of island development management. Special emphasis is placed on the role and mutual relations of sustainable development stakeholders, including local governments, tourist boards, tourist agencies, the hotel and catering sector, family farms, local action groups and the local population.

The empirical part of the paper is based on qualitative research conducted using in-depth interviews on five Croatian Adriatic islands: Dugi Otok, Krk, Lošinj, Mljet and Vis. The research results indicate that stakeholders largely recognize sustainable development as a desirable and necessary direction for the development of the islands, but at the same time warn of several structural limitations, such as depopulation, seasonality, transport isolation, infrastructure deficiencies, lack of labor and insufficiently high-quality communication between stakeholders. The need for stronger coordination of local and national levels of governance, better use of EU funds, strengthening local development capacities and more active inclusion of the resident population in

decision-making processes is particularly emphasized. In conclusion, the paper confirms that sustainable management of the Adriatic islands is not possible without an integrated approach that connects macromarketing instruments, territorial specificities and the participatory role of stakeholders. A management model is proposed that is based on the principles of sustainability, inter-stakeholder cooperation, resource protection and strengthening the quality of life of the island population, while respecting the specificities of each island.

**Frederic Jallat**

Professor, ESCP Business School, France

## **Beyond Good Intentions - The Mental Barriers to Green Hospitality**

Our research examines the psychological barriers and unconscious biases that prevent decision-makers and managers in the Southeast Asian hotel sector from prioritising and adopting environmental sustainability initiatives.

Through a detailed analysis of cognitive biases and organisational barriers, the research focuses specifically on the Singapore hotel industry while drawing out wider implications for the region and the whole industry.

The study uses a mixed-methods approach, primarily qualitative research through semi-structured interviews with key stakeholders at two major hotels in Singapore: The Oasia Hotel Downtown and the York Hotel Singapore.

The research identifies several critical cognitive biases, including status quo bias, present bias and optimism bias, which significantly influence sustainability decision-making at different levels of the organisation.

Key findings reveal that while executives tend to exhibit strategic biases such as optimism bias and confirmation bias, operational staff are more likely to favour status quo bias and lack of awareness.

The study also shows how these psychological barriers interact with organisational structures to create complex challenges for the implementation of sustainability.

The research contributes to the existing literature by providing a detailed examination of how cognitive biases manifest themselves in hospitality sustainability efforts.

It concludes with practical recommendations for overcoming these barriers through improved staff training programmes, enhanced collaboration and structural organisational changes to support sustainability initiatives.

**Reynold James**

Associate Professor, Zayed University, UAE

**Are the High Risk-Taking American Entrepreneurs Averse  
to Risk Taking in the UAE's Business Environment?  
A Conceptual Study**

The UAE attracts ethnic entrepreneurs from across the world with its level playing field, comprised of largely similar benefits and challenges. Interestingly, within this leveled entrepreneurial landscape, a significant majority of the large and reputed privately owned businesses that originated as small entrepreneurships, are owned by South Asian entrepreneurs (James et al., 2024). Conspicuously absent, are businesses of comparable stature operated by American nationals, despite the bright prospects for earning profits in the country. Why is this so, is a question worthy of deeper examination.

The foregoing situation is ironical. Why? Since on the one hand the UAE's institutional environment for business is reportedly weak and characterized by uncertainty (Ghak and Zarrouk, 2022; Kolb, 2015), while on the other, risk-taking Americans (Hofstede, 2011) who should be thriving entrepreneurs in the UAE's uncertain business environs, seem quite risk averse within it. Further, why are Americans cautious as entrepreneurs in the UAE's uncertain environs, while present in sizeable numbers as highly paid employees within the same context?

This conceptual paper seeks to theoretically explicate the foregoing underexplored situation. Concomitantly, it explores whether the Americans' recalcitrance towards investing in the UAE is to an extent attributable to their binary logic (Hibbs, 2022), that runs counter to the UAE's high uncertainty environment, more amenable to fuzziness (Dimitrov, 2002).

**Ioannis Kallianiotis**

Professor, University of Scranton, USA

## **New Monetary Policy: Is this the Appropriate One?**

The objective of this research is to measure the social benefits of the new Monetary Policy after 2008. We want to determine its effectiveness and efficiency, its social costs and social benefits, and to evaluate its optimality and its appropriateness. We are using different policy rules, correlation, causality, and a VAR model, to test the effectiveness and efficiency of monetary policy by testing the effects of policy instruments ( $i_{FF}$ ,  $MB$ ,  $M^S$ ) on the objective variables, prices (CPI), unemployment ( $u$ ), growth of GDP (RGDP), stock market (DJIA), long-term interest rate ( $i_{10YTB}$ ), and trade account (TA). By measuring the bail in cost on depositors and the bail out cost on taxpayers, we can have an indicator of its appropriateness and optimality. The empirical results show that the most of the public policy tools do not have a significant effect on the objective variables. The benefits, lately, are insignificant and the social cost enormous and the reason might be the incompetence, the corruption or the control of the policy makers. They must know what the true objective of their policy is, but they cannot satisfy it, which is the maximization of the social welfare, the wellbeing in every sector in the lives of the citizens of the country. There is a need to fix all these dysfunctional institutions and improve our democratic system. What their new liberal public policies have caused to people is just uncertainty, divisions, an enormous social cost, and pessimism for the future. After the 2024 elections and the new President in the U.S., some people had started to become more optimistic, but so far there are not any improvements. We must go back to our traditional policies and to our 3,000 years old moral philosophy and to our 2,000 years old Revealed Truth, which represent our value system, civilization, culture, faith, hope, and education and promote love for our people. Public policies must prevent crises and satisfy the current, the future, and eternal needs of humans (persons), our citizens.

**Dana Kangalakova**

Senior Researcher, Institute of Economics, Science Committee of the  
Ministry of Science and Higher Education, Kazakhstan

**Zaira Satpayeva**

Associate Professor and Senior Researcher, Institute of Economics,  
Science Committee of the Ministry of Science and Higher Education,  
Kazakhstan

&

**Aisulu Moldabekova**

Senior Researcher, Institute of Economics, Science Committee of the  
Ministry of Science and Higher Education, Kazakhstan

**The Impact of Income on Inequality in the Context of  
Kazakhstan's Social Policy: An Empirical Analysis**

The income level determines the quality of life of the population. Due to large income disparities, social inequality arises, leading to social problems. In this regard, this article aims to analyze the relationships among income levels, unemployment, and inequality in Kazakhstan for the period 2000-2024. The article uses statistical and econometric methods, in particular, least squares (OLS). The statistical base is based on data from the National Bureau of Statistics of the Republic of Kazakhstan. As a result, it was revealed that income levels and unemployment rates have a statistically significant impact on inequality in Kazakhstan. At the same time, unemployment shows a steady positive effect, enhancing income differentiation. In this regard, to reduce social inequality, social policies should be reviewed, with an emphasis on creating new jobs and increasing the income of the population, thereby improving the quality of life. The practical significance of this study lies in the fact that the results can become a guideline for the development of government measures to improve the social life of the population, and the theoretical significance lies in the fact that the results can become the basis for deeper and expanded research to identify the problems of current social policy in Kazakhstan.

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**Argiro Kliamenakis**

Assistant Professor, University of Ottawa, Canada

**Bianca Grohmann**

Professor, Concordia University, Canada

&

**Onur Bodur**

Professor, Concordia University, Canada

## **Acquiring Socially Responsible Brands: When it Helps and when it Hurts CSR Perceptions**

This research examines how firms' strategies for adding socially responsible brands to their portfolios, through acquisition versus in-house development, shape consumers' perceptions of corporate social responsibility (CSR) and related behavioral intentions. Building on signaling theory and identity signaling theory, we show that brand expansion strategy functions as a firm-level CSR signal that is interpreted through the lens of consumers' identity signaling, specifically, the extent to which they rely on socially responsible brands to express their values and identities. Because developing a socially responsible brand is more costly than acquiring one, it signals stronger CSR commitment. However, the effectiveness of this signal depends on the brand's symbolic value – its role in consumers' identity expression – and on how the acquisition is structured and communicated. Consumers who depend on highly symbolic brands for identity expression are particularly sensitive to actions that could alter the brand's meaning, prompting closer scrutiny of ownership changes and perceived shifts in values or practices.

Across seven studies using student and consumer samples, the paper provides converging evidence for this framework. Studies 1a-1c show that, relative to developing a socially responsible brand, acquisition lowers firm-level CSR perceptions when the brand is highly symbolic but not when symbolic value is low. Study 2 extends these effects to behavioral outcomes, demonstrating that acquisitions of highly symbolic socially responsible brands reduce intentions to invest in the firm and to purchase its other brands, even when the firm's prior CSR record is strong.

Study 3 identifies brand credibility – defined as the extent to which the brand is seen as able to deliver on its socially responsible value promise – as the key mechanism. Acquisitions (vs. development) of highly symbolic socially responsible brands reduce brand credibility, in turn diminishing firm CSR perceptions.

Strategies to mitigate the downside of acquiring highly symbolic socially responsible brands is then examined. Study 4 shows that brand architecture matters: following such an acquisition, positioning the brand within a house-of-brands architecture (vs. an endorsed architecture linking it visibly to the corporate brand) preserves perceived brand autonomy and enhances firm CSR perceptions for highly symbolic brands. Study 5 focuses on post-acquisition communication. When symbolic brand value is high, communication that emphasizes intrinsic, product-related cues (e.g., continued commitment to eco-friendly materials) increases brand credibility and firm CSR perceptions, whereas communication centered on extrinsic cues (e.g., leadership continuity) does not. When symbolic value is low, both intrinsic and extrinsic cues are effective.

Theoretically, the research integrates firm-level signaling and consumer identity signaling, showing that the effectiveness of CSR-related signals depends on how they intersect with consumers' identity goals. It also extends work on consumer responses to acquisitions by shifting the focus from the acquired brand to the acquiring firm and by contrasting acquisition with development as alternative expansion strategies. Managerially, the findings highlight that acquiring highly symbolic socially responsible brands can backfire for CSR positioning unless firms protect brand autonomy (e.g., via a house-of-brands strategy) and use product-focused post-acquisition communication to reassure consumers that the brand's social responsibility values remain intact.

**Plamen Koev**

Professor, San Jose State University, USA

**Jorge Delgado**

University of Zaragoza, Spain

**Ana Marco**

University of Alcala, Spain

**Juan Manuel Pena**

University of Zaragoza, Spain

**José-Javier Martines**

University of Alcala, Spain

&

**Raquel Viana**

University of Alcala, Spain

## **Accurate Computations with Totally Nonnegative Matrices of Any Rank**

We will present new algorithms for performing virtually all computations with totally nonnegative matrices to high relative accuracy regardless of whether the matrix is singular generalizing the results of Koev (2007) for nonsingular totally nonnegative matrices.

The algorithms achieve high relative accuracy by completely avoiding subtractions and thus preserving the high relative accuracy. The matrix computations include the inverse, the eigenvalues, the SVD, the Schur complement, a submatrix, as well as any minor.

The new algorithms also include for the first time the computation of the singular vectors to high relative accuracy. It also completes computations in the nonsingular case, such as submatrices (and the properties thereof) which can be singular even when the initial matrix isn't.

**Matthew Lunde**

Assistant Professor, University of Minnesota Duluth, USA

## **My Sustainability Isn't Really Mine: Material Friction and Environmental Dependence in Sustainable Consumption**

How do sustainable consumption practices persist over time? This study challenges psychological models that assume practices become self-sustaining through values, habits, or norms (Stern 2000; Ajzen 1991; Wood and Neal 2016) by revealing that sustainable consumption depends on continuous material enforcement rather than on progressing toward psychological autonomy. Drawing on 65 interviews with tiny house residents and 15 builders across 25 U.S. states, I theorize material friction as infrastructural governance that eliminates unsustainable alternatives through spatial arrangements rather than consumer persuasion.

The central empirical finding is striking: participants who maintained sustainable practices for up to seven years experienced complete practice dissolution within days when material constraints disappeared. Seth (age 59, Ohio) lived in his tiny house for seven years, yet when staying at his sister's conventional home, he "fell back into old patterns within days." His confession—"my sustainability isn't really mine, it's the house's"—reveals practices as materially constituted rather than psychologically internalized (Miller 2010). This pattern, replicated across participants regardless of duration or commitment, exposes the limits of frameworks assuming eventual autonomy.

The research study introduces environmental dependence to describe how sustainable practices persist through continuous material structuration. Material friction operates through three entangled mechanisms. Decision friction couples acquisition with divestment—bringing new items necessitates the removal of existing possessions (Gregson et al. 2007). Feedback visibility makes consumption consequences immediately visible while eliminating concealment infrastructure (Hawkins 2006; Strengers 2011). Infrastructure absence eliminates default pathways through physical impossibility—missing garages preclude car ownership, and absent storage prevents accumulation (Star 1999; Latour 1992). Together, these mechanisms produce what Latour terms "durable asymmetries," material arrangements persisting independent of individual motivation.

Environmental dependence operates through three defining characteristics that distinguish it from psychological internalization. First, practices dissolve immediately when constraints disappear,

regardless of duration. Second, practices persist through negative affect—resentment, exhaustion, anxiety—rather than positive reinforcement (Bandelj 2009), what I term reluctant sustainability. Third, practices require permanent enforcement rather than achieving eventual autonomy. Participants described consumption as “exhausting,” “suffocating,” and requiring their houses to “force” them, revealing sustainable living not as a virtue producing satisfaction but as affective endurance.

However, material friction operates unequally across social positions, exposing whose sustainability receives celebration and whose constraint remains invisible (Bourdieu 1984; Sayer 2005). The sample’s demographic concentration—predominantly white, middle-class, educated—proves analytically productive for revealing which forms of sustainability receive research attention. All participants possessed buffering resources enabling voluntary adoption: employment, credit, family support, and storage alternatives. What functions as cultural capital for voluntary simplifiers becomes a deprivation for marginalized populations. For communities of color historically subjected to involuntary spatial constraint through redlining and eviction (Alexander 2010; Desmond 2017), identical material conditions signify not ethical distinction but structural violence. Contemporary sustainability markets aestheticize friction through tiny house programming, minimalist brands, and Instagram valorization, commodifying constraint itself (Maniates 2001; Giesler and Veresiu 2014) while obscuring whose bodies become sites of celebrated sustainability versus pathologized deprivation.

This research advances consumer culture theory (Arnould and Thompson 2005) and practice theory (Shove et al. 2012) by revealing: (1) ethical subjects emerge from material infrastructure rather than preceding it; (2) absence structures practices as powerfully as presence; (3) materials prove more powerful than emotions in determining consumption outcomes. For sustainability governance, these findings reframe the central question: rather than asking how to cultivate environmental citizens, environmental dependence asks whether democratic societies will accept permanent material governance that eliminates unsustainable alternatives—and, critically, which constraints are implemented.

**Robert Mackalski**

Associate Professor, University of Nebraska-Lincoln, USA

**Seth Polsley**

Assistant Professor, University of Nebraska-Lincoln, USA

&

**Kasey Linde**

Director of Teaching, Learning and Accreditation, University of  
Nebraska-Lincoln, USA

### **Making the Case:**

## **The Impact of Case Studies and Experiential Learning on Brand Equity and Employment Interest**

This study explores the impact of case studies and experiential learning on brand equity and employment interest, within the context of an undergraduate marketing class. Using a quasi-experimental study design, the researchers assigned two groups of students to read the same marketing case on a popular local brand. The treatment group interacted with the case protagonist (a brand representative) and sampled the product in class prior to evaluation, while the control group did not have these experiential encounters until later. Results showed increased brand equity among both groups who read the case study, as measured via Net Promoter Score (NPS), with significantly more improvement in brand equity with the treatment group. Employment interest also increased in both groups, especially with the experiential additions. The findings suggest that experiential components such as guest speakers and product sampling enhance the impact of case-based learning on both brand equity and employment interest in the brand.

**Gohar Marikyan**

Full Professor, SUNY Empire State University, USA

## **Mathematics Education Worldwide**

My research topic focuses on the level of mathematical knowledge worldwide and ways to improve it. Evaluating the mathematical competency of the global population is complex because it varies significantly across countries, age groups, education levels, and whether we are measuring school students or adults. Additionally, the level of mathematical knowledge varies widely, ranging from basic numeracy and arithmetic to advanced calculus. There is no precise global percentage for mathematical proficiency, as no single organization tests every country using the same criteria for what constitutes “proficiency beyond basic arithmetic.” However, based on international adult skills surveys, educational data, and numeracy research, we can draw some conclusions. Research indicates that approximately 18–20% of adults in the surveyed countries possess only very basic numeracy skills. Furthermore, about 60–75% of the world’s population likely lacks strong proficiency beyond basic arithmetic. This implies that most people can manage addition, subtraction, simple multiplication and division, and everyday money calculations. Additionally, data suggests that 20–35% of individuals are comfortable with percentages, algebra, and statistics; 5–15% demonstrates strong STEM-level mathematical reasoning; and only 1% possess knowledge of advanced university-level mathematics. These statistics are concerning, as a solid understanding of basic mathematics is essential for making informed decisions in everyday life, such as managing finances, cooking, and planning activities. Moreover, studying mathematics fosters analytical thinking, which is crucial in all careers. Mathematics is also widely applicable in both the arts and sciences. Given these challenges, it is important to explore the underlying reasons for poor mathematical knowledge worldwide. How can this issue be addressed? What strategies are most effective? Is it possible to devise a universal improvement plan?

**Aisulu Moldabekova**

Senior Researcher, Institute of Economics, Science Committee of the  
Ministry of Science and Higher Education, Kazakhstan

**Dana Kangalakova**

Senior Researcher, Institute of Economics, Science Committee of the  
Ministry of Science and Higher Education, Kazakhstan

&

**Zaira Satpayeva**

Associate Professor and Senior Researcher, Institute of Economics,  
Science Committee of the Ministry of Science and Higher Education,  
Kazakhstan

**Household Consumption Expenditure and Credit Burden  
Patterns: An Empirical Regional Analysis of Kazakhstan**

This article examines patterns of household consumption expenditure and credit burden in Kazakhstan in the context of expanding consumer lending, with a focus on regional and settlement-level differences. The study aims to identify structural features of regular and irregular expenditures, assess territorial differentiation in credit burden, and analyse how credit use is linked to household consumption strategies and subjective well-being. The empirical basis is a nationally representative survey of the population aged 18 and over (N = 2000), conducted in August–September 2024. The multi-stage stratified sample covers all regions of Kazakhstan and is proportionally distributed by type of settlement (republican cities, regional centres, small towns, rural areas), gender, age and major ethnic groups. This design ensures representativeness for key territorial and socio-demographic strata and allows consistent comparison with official household budget indicators. The article distinguishes between regular monthly expenditures (food, out-of-home food, utilities, transport, debt servicing, housing, education, insurance, cultural activities, spending on pets and others) and irregular annual expenditures (savings, leisure and tourism, durable goods, car maintenance, festive spending, support to relatives, clothing and footwear). The findings show that total regular expenditures are highest in rural areas and republican cities, and lowest in small towns, while expenditure structures exhibit strong territorial specificity. In large cities, housing and out-of-home food account for a higher share, whereas in rural areas spending on pets and credit servicing is more significant. Across all settlement types, food, debt servicing, education and housing form the core expenditure categories, but household size reshapes their relative shares. The comparison of expenditure patterns and credit

burden with subjective assessments of well-being demonstrates that consumer lending operates as a mechanism smoothing visible differences in consumption standards across income groups, while simultaneously increasing indebtedness and financial vulnerability.

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**Luciane Mulazani dos Santos**

Full Professor, Santa Catarina State University (UDESC), Brazil

### **Mathematics Teacher Training in a Pedagogy Course: A Narrative Research on Memories in Relation to Mathematics**

This paper discusses the teaching of mathematics in Basic Education. It debates the training of mathematics teachers that takes place in Pedagogy courses, that is, the training of teachers who will teach mathematics to children from Early Childhood Education to the 5th grade of Elementary School. Its objective is to present the results of a research that investigated how the memories and feelings of future teachers – in relation to mathematics – (referring to the period when they were students in Basic Education) affect their expectations for teaching mathematics when they enter the profession. The research had a qualitative approach. It was carried out with the participation of 22 Pedagogy students who were taking the course “Mathematics and Teaching” at a public university in Southern Brazil. The study design followed the procedures of narrative research (Clandinin & Connelly, 2011). Interviews were conducted with the participants, which were recorded, transcribed, and subsequently analyzed using the paradigmatic model of narrative analysis (Bolívar Botía, 2002). Analysis of the narratives revealed common elements among the events experienced by the participants. During a group activity, these elements were presented to them to stimulate reflection on how memories and feelings about mathematics influence their expectations about how their teaching actions will be when they teach mathematics in Basic Education in the future. In the debate, the group's conclusions were discussed in light of ideas about creative insubordination (D’Ambrósio & Lopes, 2015), producing suggestions on how to face the challenges of being a mathematics teacher and how to break with traditional models of mathematics teaching, for the benefit of students. The research results showed that mathematics classes in Basic Education were reported as negative experiences. Most of the memories about mathematics revealed by the students were associated with feelings of fear: dread of making a mistake; nervousness before and after school tests; pressure to succeed in the subject; austerity of teachers; fear of failure; feelings of inadequacy and incompetence. The strategies proposed by the participants to address these situations were: the teacher having an attentive and careful eye towards the students; the teacher seeking to understand the students' life context; the teacher conducting assessments as a continuous and

formative process; the teacher being concerned with the emotional well-being of the students; the teacher using different methods and materials to explain mathematics. The research also showed that critical reflection on mathematics teaching – motivated by the narratives of memories from teachers in training – was important for the discussion process about the profession of the teacher who teaches mathematics in the early school years. Reflection on teaching practice in mathematics, through the memories of Pedagogy students, was a movement that enabled an evaluation of future pedagogical actions. The participants brought the narrated facts of their experiences and the perception of how necessary it is to change the way mathematics is taught.

**Ampalavanar Nanthakumar**

Distinguished Teaching Professor, State University of New York at  
Oswego, USA

**Some Properties of the Generalized Pareto Distribution**

Here in this paper, we will study the conditions needed for certain properties of the generalized Bivariate Pareto Distributions to hold. Towards, this we will use the following notations.

Let  $X_1, X_2$  follow a Bivariate Pareto Distribution where the following notations mean the joint probability or marginal probability.

$$F_{12}(x_1, x_2) = P(X_1 \leq x_1, X_2 \leq x_2) \quad (1)$$

Then the marginal distributions are given by

$$F_1(x_1) = P(X_1 \leq x_1) \quad (2)$$

$$F_2(x_2) = P(X_2 \leq x_2) \quad (3)$$

We investigate the conditions that are needed for some of the properties to hold such as BISR (Bivariate Increasing Success Rate), PUOD (Positive Upper Orthant Dependence), NUOD (Negative Upper Orthant Dependence), PLOD (Positive Lower Orthant Dependence), NLOD (Negative Lower Orthant Dependence), RTI (Right Tail Increasing), RTD (Right Tail Decreasing), RCSI (Right Corner Set Increasing) in the context of the two generalized Bivariate Pareto Distributions given below.

The results of this investigation will be presented during the ATINER conference on Statistics (June 29 - July 2, 2026).

**Sankaran - Nair Bivariate-Pareto Distribution (SNBP):**

$$F_{12}(x_1, x_2) = P(X_1 \leq x_1, X_2 \leq x_2) = 1 - (1 + \alpha_1 x_1)^{-\theta} - (1 + \alpha_2 x_2)^{-\theta} + (1 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_0 x_1 x_2)^{-\theta},$$

where  $\theta > 0$  (4)

**Bivariate Pareto Distribution (Modified):**

$$F_{12}(x_1, x_2) = 1 - \left(1 + \left(\frac{x_1 - \theta_1}{\theta_1}\right)\right)^{-\alpha} - \left(1 + \left(\frac{x_2 - \theta_2}{\theta_2}\right)\right)^{-\alpha} + \left(1 + \left(\frac{x_1 - \theta_1}{\theta_1}\right) + \left(\frac{x_2 - \theta_2}{\theta_2}\right) + \beta \left(\frac{x_1 - \theta_1}{\theta_1}\right) \left(\frac{x_2 - \theta_2}{\theta_2}\right)\right)^{-\alpha} \quad (5)$$

where  $\beta > 0$  is the dependance parameter. Also note that  $x_1 > \theta_1$  and  $x_2 > \theta_2$ .

**Margarita Nyfoudi**

Associate Professor, University of Birmingham, UK

## **Dialogic Interactions in the Era of Intense Teleworking: A Conceptual Model and Research Agenda for Trust Dynamics**

The aim of this paper is to examine workplace dialogic interactions under intense teleworking conditions and, in particular, the constituent role that trust plays in the effective replication of face-to-face dialogic discourses online. Albeit the role of trust has been extensively studied in interpersonal exchanges (e.g., Lewicki et al., 2006; Kong, Dirks, & Ferrin, 2014; Nienaber et al., 2015, Lu, Kong, Ferrin, & Dirks, 2017) and online communication (Kim & Peterson, 2017, Wang, Min, & Han, 2016; Breuer, Huffmeier, & Hertel, 2016), it is less clear how intense teleworking tempers interpersonal trust and subsequently, workplace dialogic interactions. Specifically, we draw on Mayer, Davis, and Schoorman's (1995) model to explicate the central role of the stages of trust development in trust-informed dialogic interactions. Our focus falls on three workplace exchanges, peer-to-peer, manager-to-employee, and manager-to-team, as the three most common exchanges in the contemporary workplace. We encounter three main outcomes: performance-related, developmental, and social, and also highlight the challenges of trust development and dialogic discourse for workplace relationships established and cultivated exclusively online. The study has three major contributions. First, it extends our understanding of the instrumental role trust plays in interpersonal relationships and, specifically, in constructive, dialogic discourses (Whitener et al., 1998, Zittoun, 2014; Markova & Gillespie, 2008). Second, our paper adds to the literature on workplace dialogic interactions (e.g., Tsoukas, 2009; MacIntosh et al., 2012; Baralou & Tsoukas, 2015) by exploring how they could unravel within an environment of extreme teleworking. Finally, this work raises the question of accessibility and whether the abrupt and haphazard mandate for obligatory teleworking has excluded certain groups of employees from the benefits of dialogical discourses.

**Martin O'Brien**

Professor, University of Wollongong, Australia

### **Private Versus Public Sector Wage Leadership: Incorporating the Role of Asymmetry**

Until recently the analysis of private and public sector wages was focused on the estimation of public sector wage premiums using microeconomic data. Approximately a decade ago a new line of enquiry emerged, analysing the co-movements, dynamics and spillovers between private and public sector wages using macroeconomic time series data. Often based on wage leadership theory, such analyses typically employed vector error correction models (VECMs) to identify and quantify aspects of the interrelationship between private and public sector wages. While the Scandinavian model asserted that the private sector should be the wage leader, empirical analyses of European economies provided mixed results, with the public sector often identified as the wage leading sector. However, results varied across studies, seemingly dependent upon both the model specification as well as time period analysed. In order to obtain a more thorough and nuanced understanding of wage setting patterns and the dynamics between private and public sector wage time series, the current study analyses the role of asymmetry and non-linear adjustment to wage shocks using a threshold vector error correction model (TVECM) specification. Using quarterly data from 1998 to 2025 for Australia as a whole, as well as for eight individual States and Territories, results show that the dynamic adjustment of private and public wages to wage shocks are dependent upon both the sign and size of such shocks. These findings provide important insights into why wage adjustments between private and public sectors vary over time in response to different economic conditions and in response to the nature of different wage shocks. These findings provide insights into understanding of wage dynamics and the relationship between private and public wages, providing important policy implications for public wage setting as a macroeconomic management tool.

**Lucky Otame**

Lecturer, Bournemouth University, UK

&

**Mehdi Chowdhury**

Professor, Bournemouth University, UK

## **Migration and Remittance Decisions: Evidence from a Recursive Bivariate Probit Model of Bangladeshi Households**

Literature suggests that migration and remittance decisions are interdependent within households, yet empirical studies that jointly model these processes remain limited. While remittance behaviour is often shaped by family ties, the initial decision to migrate is widely believed to depend on household socioeconomic conditions. These dynamics suggest a potentially endogenous relationship between migration and remittance flows. This study examines this relationship using a recursive bivariate probit model applied to nationally representative data from the Bangladesh Household Income and Expenditure Survey (HIES) 2016. Two binary outcomes are jointly estimated: whether a household sends a migrant abroad and whether it receives remittances. The models control for household socioeconomic characteristics, demographic structure, rural-urban location, education, gender of the household head, asset ownership, safety nets, and exposure to shocks. The results reveal a strong and statistically significant recursive relationship between migration and remittance receipt, with migration substantially increasing the probability that households receive remittances. Household income also positively influences migration decisions, indicating that financial capacity facilitates international migration. The findings suggest that migration serves as an important household income-diversification and risk-management strategy. Policy measures that reduce financial barriers to migration, strengthen safe migration frameworks, and improve remittance systems could enhance the developmental benefits of migration.

**Erica Patente Nascimento**

Professor, State University of Northern Paraná (UENP), Brazil

**Eric Noventa de Souza**

PhD Student, State University of Northern Paraná (UENP), Brazil

**Marcela Ribeiro de Albuquerque**

Professor, State University of Northern Paraná (UENP), Brazil

&

**Leonardo José Oliveira e Silva Rosalem**

Professor, State University of Northern Paraná (UENP), Brazil

## **Heuristics and Bounded Rationality in Behavioral Economics: A Systematic Mapping Study**

Behavioral economics emerged as a response to the limitations of traditional economic models, which assume perfectly rational agents and efficient markets. By incorporating insights from cognitive and social psychology, this approach seeks to understand how individuals make economic decisions, considering factors such as heuristics, cognitive biases, emotions, and social norms. This article proposal aims to conduct a systematic mapping of the role of cognitive heuristics in behavioral economics, with an emphasis on the bounded rationality of economic agents. The work will be guided by the theoretical foundations of authors such as Herbert Simon, Daniel Kahneman, and Amos Tversky, whose contributions question the traditional model of full rationality and propose a more realistic approach to decision-making. Its applications range from public policies to personal finance, marketing, education, and health, revealing the complexity of human behavior in economic choices. The article will map the main theoretical debates on the topic, seeking to identify existing gaps in the literature, explore interdisciplinary contributions between economics and cognitive psychology, and reflect on the implications of these approaches for understanding economic behavior. It intends to identify and analyze the main types of heuristics – such as representativeness, availability, and anchoring – and investigate how these mechanisms influence economic choices in different contexts. It is considered that heuristics function as rules of thumb that, although simplifying the decision-making process, can generate systematic biases. The adopted methodology will be a literature review, with the aim of locating, classifying, and systematizing relevant existing studies, both Brazilian and international, utilizing national and international academic databases, as well as reference management tools.

**Rudi Penne**

Full Professor, University of Antwerp, Belgium

&

**Ivan De Boi**

Postdoctoral Researcher, University of Antwerp, Belgium

## **The Axis of Ruled Surfaces of Revolution, 3D Laser Scanners, and Laser Dot Conics**

Ruled surfaces are surfaces that are swept by a straight line moving in Euclidean 3-space.

Classic examples are generated by rotating a line around a fixed axis, yielding a one-sheeted hyperboloid of revolution, a circular cone or a circular cylinder (except for some degenerate planar cases). These ruled surfaces of revolution have been the inspiration for various artists and architects. But our interest is mainly motivated by sensors and other devices that make use of rotating lasers.

We cope with situations where we can control (and know) the angles of rotation of the moving laser, which is moreover assumed to be measurable in at least three different positions. Let us represent the angles of the rotating laser by points on the (unit) circle. The core of our research is a simple but very stable affine combination of three points, with rationally parametrized coefficients that merely depend on the relative angles, generating the circumscribed circle. We previously published the observation that these affine coefficients can be copy-pasted for the (normalized) **Plücker coordinates** of the corresponding measured laser positions, predicting other laser positions. In the same spirit we now present an affine combination of three points, depending on relative angles, that generates the center of the circumscribed circle. Again, the formula is simple, but the award is nice, since it can be applied to the lines of a ruled surfaces of revolution, recovering the central axis. Both observed formulas, initially meant for circles, appear to be very useful in the calibration of and the reconstruction by 3D (laser) scanning.

But this is not the end of the story. After having transferred the circle relations to the rulers of a surface of revolution, we can return to points by intersecting these rulers by a random plane. In general, this intersection yields a **conic**, rather than a pure circle, but nevertheless the same formulas (generating new points or recovering the point on the central axis) remain valid, under the condition that we consider **weighted intersections**. Not only for applications, but also from a geometrical point of view, it is interesting to generate the points of a conic by affine combinations of **three** points (with given angles of revolution).

As a matter of fact, the presented circle relations tell a never-ending story. Indeed, when we take a picture of these previously obtained (weighted) conic points, then this is equivalent with constructing a cone with top equal to the camera center (assuming a pinhole model). And guess what? The same affine relations survive, now applied to the rulers of the cone, again after adapting the weights. On its turn, the final image is a planar intersection of this cone, implying a conic subject to the same relations once again.

**Musa Pinar**

Professor, Valparaiso University, USA

&

**Tulay Girard**

Professor, Penn State Altoona, USA

## **Examining the Importance of Macro and Micro Country Branding Dimensions: Do They Differ by Consumer Demographics?**

Recently, nation branding has become strategically essential for countries seeking to achieve and sustain success in the competitive global marketplace (Anholt, 2007; Kotler & Gertner, 2002). Fan (2006) explains that nation branding involves using branding and marketing communication strategies to enhance a country's image. It functions as a form of soft power (Nye, 2004) – a marketing tool that attracts residents, tourists, businesses, investors, and trade partners (Anholt, 2005; Dinnie, 2008; Kotler & Gertner, 2002). Moreover, it can strengthen a country's economic position by drawing foreign investment and improving its trade balance (Loo & Davies, 2006).

Hao et al. (2021) provide a comprehensive review of the branding literature and note that the field of nation branding remains fragmented, having evolved along diverse theoretical and methodological paths over the past two decades. Building on this, He et al. (2021) identified macro, micro, and nation-brand equity as key conceptual and measurement approaches representing an integrated view of nation branding. However, He et al. did not specify the dimensions of the constructs that provide scale measures for the macro, micro, and nation-brand equity factors. Instead, they suggested using an importance scale to measure these dimensions.

Drawing on the literature, Pinar et al. (2025) identified specific dimensions of macro factors, micro factors, and nation brand equity, showing that each can be measured across multiple aspects. The macro factors include the economy, technology, governance, politics, society, and trust. The micro factors are product quality, exports, tourism, and foreign direct investment (FDI). The country brand equity dimensions are brand awareness, brand associations, perceived quality, and brand loyalty.

In a study, Duran-Tekoglu et al. (2026) developed a survey instrument to measure the dimensions of macro factors, micro factors, and nation brand equity that were identified by Pinar et al. (2025). They conducted a pretest study using these macro, micro, and country brand

equity dimensions, with a 7-point importance scale ranging from 1 (very unimportant) to 7 (very important). Their factor analysis, based on 185 pretest surveys, showed that the macro factor had six distinct dimensions: technology, government, trust, society, economy, and politics; the micro factors had four distinct dimensions: tourism, exports, global performance, and foreign direct investment (FDI); and country brand equity had three dimensions: perceived quality, country image, and brand awareness. This study incorporates these dimensions to evaluate the importance of these factors in building a strong national brand. The specific objectives are to:

- 1) Examine the importance of the dimensions of a) macro factors, b) micro factors, and c) country brand equity.
- 2) Assess whether respondent demographics such as gender, age, education, and income influence the importance assigned to macro, micro, and country brand equity dimensions; and
- 3) Discuss the implications of the findings for nation branding and country brand equity.

We conducted a survey using the macro, micro, and country brand equity factors that were identified by Duran-Tekoglu et al. (2026). The survey link was sent to Prolific members. We collected 465 usable surveys. This data set was used to address the research objectives (ROs) of this study. As an initial analysis, a one-sample test for the importance of these dimensions was conducted using a neutral value of four (4) as the benchmark on the 7-point scale. Results show that all dimensions are significantly higher than the mid-value (4) at  $p < .01$ , indicating that each is viewed as important in building a strong nation brand. Additional analysis will be conducted to address the ROs and present the results for each RO. The study will also discuss the implications of the findings for country branding.

**Zbigniew Polanski**

Professor and Head, Department of Economic Policy and Monetary  
Theory, SGH Warsaw School of Economics, Poland

&

**Mikołaj Szadkowski**

Professor, SGH Warsaw School of Economics, Poland

## **Central Bank Profits, Liquidity, Risks, and Money Creation**

Given recent experience of many industrialized countries' central bank losses, the starting point of the study is to answer the question under which conditions the existence of seigniorage, i.e., income from the creation of money, guarantees a positive financial result (profit) of a central bank. In other words, under what circumstances is seigniorage insufficient for a central bank to make a profit?

Based on the concept of endogenous creation of credit money, stating that the lending action of the commercial banking sector is the basic premise for the creation of money, the analysis in the paper, based on simple modelling and stylized balance sheets, allows the following conclusions to be drawn.

First, when the central bank only conducts conventional monetary policy (i.e. it is implemented exclusively by means of an interest rate while the bank is focusing its activities on shaping the liquidity of the banking sector), the central bank makes a profit, but de facto it does not create money in the economy in the sense of M1-M3 monetary aggregates (this is done by the commercial banking sector).

Second, if the central bank performs additional tasks (e.g., managing foreign reserves or conducting unconventional monetary policy), then the central bank's financial result is affected by various additional financial risks (exchange rate, interest rate, credit) related to assets and liabilities that appear on its balance sheet. When the central bank undertakes these additional tasks, money creation in the economy is influenced by the sector with which the central bank transacts. If its counterparty is the commercial banking sector and the purchase of domestic debt securities or other (e.g., foreign) financial assets by the central bank takes place, then money is not created, but the financial result and the associated risk are transferred from the banking sector to the central bank. In other cases, i.e., when the central bank transacts with the non-bank sector, it directly creates money in the economy.

Third, the ratio of the banking sector's excess liquidity or deficit liquidity to the money stock can be an indicator of the degree to which the central bank performs tasks unrelated to conventional monetary

policy. Thus, it may be an indicator of the exposure of the central bank's financial result to fluctuations related to a factor other than the central bank's reference rate. We show, based on IMF data, that over the last two decades there has been a worldwide increase in the involvement of central banks in the performance of tasks other than conventional monetary policy.

**Andrei Radulescu**

Senior Researcher, Institute for World Economy, Romanian Academy,  
Romania

&

**Iulia Monica Oehler Sincai**

Senior Researcher, Institute for World Economy, Romanian Academy,  
Romania

## **The European Economic Convergence in CEE - Structural Developments and Challenges**

The countries in Central and Eastern Europe have recorded a remarkable European economic convergence process over the past decades. The high speed of the convergence was fuelled by the consequences of their integration within the European Union, including the massive inflows of capital and technology, with a positive impact on the annual potential growth pace. We point out that this convergence process was also influenced by the structural weaknesses in the Western part of the European Union, which determined a severe deterioration of the annual growth pace following the outbreak of the Global Financial Crisis (GFC).

If we consider the four largest economies in the region, it can be noticed the high speed of the convergence of Romania, where GDP/capita at PPS as a percentage of the EU average, has almost doubled since 2006 (the year before the EU membership). There followed Poland, Hungary, and Czechia, if we estimated the average annual growth pace in GDP/capita at PPS as a percentage of the EU average since 2004.

However, a slowing down of the economic convergence of CEE towards the EU average can be noticed since the beginning of this decade, an evolution determined by the consequences of the world shocks in the period of the Great Transformations - the coronavirus pandemic, the geopolitical tensions, and the erosion of multilateralism.

This paper applies standard econometric tools, including the Cobb-Douglas production function, and uses the databases of Eurostat and the International Monetary Fund (IMF) to assess the structural developments in terms of the European economic convergence process in the largest four economies in CEE in the past three decades, the period 1996-2025.

According to the results of the econometric analysis, the annual potential growth pace has been slowing down in the CEE countries in recent years, in the context of the consequences of the world's shocks.

Furthermore, there are important differences among the CEE countries in terms of the contribution of the production factors to the annual potential growth rates, determined by the policy mix under implementation in each country.

Overall, our analysis points out the need for a new model of European economic convergence in CEE, based on qualitative forces (instead of quantitative items), including the continuity of the structural reforms, a better allocation of domestic resources, an acceleration of the implementation of technological progress, and a stronger regional economic integration.

**Mignon Reyneke**

Associate Professor, TIAS Business School, Tilburg University,  
The Netherlands

**Federica Ceccarelli**

Researcher, TIAS Business School, Tilburg University, The Netherlands  
&

**Gillian Wright**

Professor, TIAS Business School, Tilburg University, The Netherlands

## **Is Green the New Gold? How Identity and Values Shape Sustainability Perceptions in Luxury among Gen X and Gen Z**

Luxury brands are increasingly embedding values of sustainability and ethical practices into their core organizational culture and policies driven by consumer demand for transparency and social responsibility. Major luxury groups, such as Kering, have pioneered initiatives to develop sustainable materials and reduce environmental impact, showcasing their commitment to corporate social responsibility (Hemonnet-Goujot, Kessous, and Magnoni, 2022).

The growing emphasis on sustainability in the luxury sector reflects broader societal shifts towards environmental awareness and ethical consumption. As consumers become more conscious of the impact of their purchases, luxury brands have adapted to meet these expectations, driven by media scrutiny, regulatory pressures, and the need for brand differentiation through sustainable practices (Roper et al., 2013; Athwal et al., 2019).

In today's rapidly evolving luxury market, sustainability has become pivotal in shaping consumer behaviour and brand strategies (Seo and Buchanan-Oliver, 2019). As luxury brands increasingly integrate sustainable practices, understanding how different generational cohorts perceive and interact with these initiatives is critical. While previous studies have documented the general trend towards sustainability in luxury brands and generational differences between Millennials and Generation Z (Kapferer and Michaut-Denizeau, 2019), there is a notable gap in understanding how these sustainability practices are perceived and engaged with differently by Generation X and Z.

Given the importance of understanding the market to shape effective business strategies and adapt to ongoing changes, particularly with the generational shift of two major market segments (D'Arpizio et al., 2019), this research explores the different perceptions of sustainability practices in luxury brand consumption between Generation X and Generation Z.

To achieve this, the research aims to answer the following research question:

*What are the differences in perception of sustainability practices in luxury brand consumption between Generation X and Generation Z?*

In order to answer this question, three sub-questions were explored:

1. What is the perception of luxury sustainability practices amongst Gen X and Gen Z through the lens of brand value and social identity?
  - 1) How does sustainability in luxury brands impact the purchase behaviour of Gen X and Gen Z?
  - 2) How do Gen X and Gen Z engage with communication around sustainable luxury brands?

To answer the above research questions, a qualitative method was employed by conducting in-depth, semi-structured interviews with participants from both cohorts to investigate the drivers of these groups' perceptions of, and engagement with, sustainability initiatives in the luxury market.

Through the application of Consumer Value Theory and Social Identity Theory the findings reveal significant differences: Generation X values authenticity, quality, and long-term brand loyalty, viewing sustainability as an integral, yet not overemphasized, aspect of luxury brands. In contrast, Generation Z prioritize social identity and ethical considerations, which are heavily influenced by "green conspicuousness," where sustainability enhances social value and drives purchasing decisions. The study also highlights varying levels of engagement with sustainability practices, with Generation X showing skepticism towards sustainability as a marketing strategy, while Generation Z demand greater transparency and active communication from brands.

**Marcela Ribeiro de Albuquerque**

Professor, State University of Northern Paraná (UENP), Brazil

**Luis Ricardo da Silva Miguel**

Student, State University of Northern Paraná (UENP), Brazil

&

**Erica Patente Nascimento**

Professor, State University of Northern Paraná (UENP), Brazil

## **Financialization and the Supplementary Health System in Brazil: A Bibliographic Study**

The supplementary health sector in Brazil (the private healthcare system) has become increasingly susceptible to the impacts of financialization, a process wherein financial logic dictates the operation of markets and social services. Understanding this phenomenon is critical, as the capital accumulation processes of healthcare providers in Brazil may influence public access to rights guaranteed by the 1988 Federal Constitution. This qualitative and bibliographic research aims to survey and analyze academic studies addressing the presence of financialization within the Brazilian supplementary health system. The study draws upon scientific articles, dissertations, and theses sourced from national and international academic databases. The methodology entails the construction of a theoretical-analytical framework grounded in political economy, emphasizing key concepts and perspectives on the subject. The research is justified by the necessity of understanding how financialization shapes the supplementary health sector and its potential to exacerbate inequalities in healthcare access. The findings include a bibliographic synthesis that contributes to the critical development of social actors and enriches the academic discourse on the relationship between healthcare provision, markets, and financialization in the Brazilian economy.

**Hemmat Safwat**

Director, Energy Development Services, Greece

## **Competitiveness of European Countries**

The paper (part I) applies the recently introduced Knowledge-Energy Index (KEI), which is calculated as the ratio of a nation's annual average hourly wage (AWH, €/h) to its annual electricity price (AEP, €/kWh). Using robust data for European nations from 2020 to 2024, KEI estimates were computed for twenty-six countries and classified into four groups. Group 1, comprising nine nations, has the lowest KEI range; Group 2, with eight nations, represents the next level; Group 3 includes four nations at the third KEI level; and Group 4 comprises five nations with the highest KEI range. The paper emphasizes the importance of using a consistent methodology to determine both AWH and AEP.

Part I also highlights the need to strengthen human capital (HC) and intellectual capital (IC) to support higher AWH while working to reduce AEP. Together, these actions provide a pathway to a higher KEI and a stronger competitive position. Part I further notes that many nations' competitiveness is vulnerable to energy-price fluctuations; therefore, countries must address this risk to preserve or improve their competitive standing.

In part I, twenty-six countries were grouped into four competitiveness levels. Part II examines the nations' economic structure and profile underlying its KEI level. The analysis covers both general country indicators (9 categories with subcategories) and specific private-sector industries indicators (4 categories with subcategories). The presentation follows a common structure which enables easy and efficient comparisons between nations. The main source of the data is Eurostat as was used in part I to keep the uniformity of the data. When additional data were warranted; the additional sources were identified. The confidence level in the data was discussed. By presenting these economic profiles, the paper clarifies the factors that create distinctive effects on higher competitiveness. Part II adds to the reinforcement of the KEI approach of part I.

**Cigdem Sahin Basfirinci**

Professor, Trabzon University, Türkiye

## **Consumer Acceptance of Cultured Meat in Türkiye: Making Sense of the Unnatural**

Cultured meat represents one of the most radical innovations in contemporary food systems, calling into question deeply embedded cultural assumptions about meat, nature, and food production. Produced through cell-based technologies in laboratory settings, cultured meat is promoted on the grounds of environmental sustainability and animal welfare, while simultaneously provoking public debate due to concerns related to naturalness, food safety, and the extent of technological intervention in food. Existing research has largely focused on Western European and North American contexts, leaving consumer perceptions and acceptance of cultured meat in culturally distinct and meat-centric societies relatively underexplored. This study addresses this gap by examining consumer acceptance of cultured meat in Türkiye through the lens of meaning-making and individual differences.

The research is based on a large-scale survey conducted with 1,511 consumers in Türkiye. Rather than conceptualizing acceptance solely as a willingness to adopt or purchase a novel food product, the study approaches consumer acceptance as a multi-layered interpretive process shaped by cultural norms, moral reasoning, and the symbolic meanings attributed to food. Accordingly, the analysis focuses on consumers' perceptions of naturalness, ethical evaluations, trust in food technologies, and the perceived legitimacy of cultured meat as "real meat."

In addition to exploring these core perceptions, the study examines whether such interpretations vary according to consumers' levels of conservatism, age, and educational attainment. These socio-demographic and value-based characteristics are considered central to understanding how different consumer groups negotiate the tensions introduced by radical food innovations. Difference-based analyses are employed to explore potential variations in perceptions, interpretations, and behavioral orientations across these groups, without advancing predetermined assumptions regarding the direction or magnitude of such differences.

The study further extends the notion of consumer acceptance by examining behavioral orientations toward cultured meat, including willingness to try, purchase intentions, and inclination to purchase under

specific conditions. Particular attention is paid to the role of contextual factors such as price considerations, trust in regulatory frameworks, availability of information, and perceived safety assurances. By incorporating these dimensions, the study seeks to illuminate how acceptance is not a fixed or binary outcome but rather a conditional and negotiated stance that may evolve depending on situational and institutional cues.

Rather than offering definitive conclusions, this research aims to capture the complexity, ambivalence, and uncertainty that characterize consumer responses to cultured meat. Conceptually, it contributes to marketing and branding scholarship on radical innovations and contested consumption by framing acceptance as an ongoing process of cultural and moral negotiation. Empirically, it seeks to broaden the cultured meat literature by providing insights from Turkiye, a context in which food traditions, ethical sensibilities, and skepticism toward technological intervention intersect in distinctive ways.

*This research forms part of a project supported by TÜBİTAK (Project No. 224K049) within the framework of COST Action 18105, focusing on consumer acceptance and market perceptions of cultured meat in Turkiye.*

**Zaira Satpayeva**

Associate Professor and Senior Researcher, Institute of Economics,  
Science Committee of the Ministry of Science and Higher Education,  
Kazakhstan

&

**Dana Kangalakova**

Senior Researcher, Institute of Economics, Science Committee of the  
Ministry of Science and Higher Education, Kazakhstan

**Development of Kazakhstan's Innovation Infrastructure in  
the Context of Digitalization**

The innovation infrastructure is a key factor in modernizing Kazakhstan's economy. This study examines the development of innovation infrastructure in Kazakhstan amid digital transformation. The study is based on a qualitative approach combining content analysis to identify policy priorities and a case study methodology to demonstrate the practical implementation of digital technologies across innovation infrastructure facilities. The findings reveal that IT startups are the main element of national innovation systems in the context of digitalization, and the development of Kazakhstan's innovation infrastructure is characterized by the emergence of new institutional elements, including the Astana Hub, regional IT hubs, business incubators, and accelerators. While Kazakhstan has made significant progress in developing institutional support mechanisms, a gap remains in the adoption of advanced digital tools, particularly at the regional level. Although digital solutions such as online acceleration programs and cloud technologies are increasingly used, especially in educational processes, there is a need to expand access to innovation services beyond geographic constraints. The study concludes that the future development of the innovation infrastructure will increase enterprises' digital maturity, expand access to digital innovation support tools, and integrate regional and national digital platforms into a unified system for interaction among innovation participants.

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**Robert Schneider**

Distinguished Service Professor, State University of New York at  
Brockport, USA

## **Using Competitive Sport to Develop Entrepreneurial Skills**

A form of experiential learning, competitive sport supports an entrepreneurial mind-set while establishing skills similar to those skills necessary to succeed as an entrepreneur. Successful entrepreneurship characteristics including learning, adjusting, and building resistance were found to take place from experiential learning (Geleske, 2019). Personality traits of athletes align with entrepreneurial success (Steinbrink et al., 2020) and those who engaged in the experience of sport were found to acquire entrepreneurial thinking (Matsankos et al., 2020). Expanding entrepreneurship through the use of competitive sport calls for an implementation process grounded in points identified by McCole et al. (2022) who focused on helping sport participants understand the connection between skills gained from sport and how to apply those same skills to a future profession centered on entrepreneurship.

**Samuel Seaman**

Professor, Pepperdine University, USA

## **Engaging the Next Generation: A Strategic Imperative for Credit Unions in the Social Media Era**

Over half of Gen Z express concerns about their financial security, a dread twice as prevalent as amongst Baby Boomers. This heightened apprehension may be compounded by their primary reliance on social media for financial advice. Relying on digital sources for advice presents a paradox: an unprecedented opportunity for financial institutions to connect with and educate a vast, digitally savvy audience; yet also a considerable challenge given the varied quality and objectivity of content from Financial Influencers on these platforms. The conjunction of Gen Z's financial insecurity and their digital native habits, has revealed an urgency for credit unions to adapt their communication strategies. Credit unions, with their inherently member-centric mission and deep community roots, are uniquely positioned to address the financial needs of Gen Z and build lasting trust in this evolving digital landscape...enhanced by the power of Pattern Recognition and Machine Learning. Their foundational values align naturally with Gen Z's demand for authenticity, social responsibility, and transparent practices. In order to effectively engage this demographic, however, credit unions must adapt their communication strategies; embracing dynamic content formats, such as short-form video, leveraging humor and authentic storytelling, and fostering genuine two-way conversations. This circumstance is not merely a marketing opportunity; it represents a strategic opportunity for long-term relevance and fulfillment of the credit union mission.

Given the general lack of social media savvy among traditional financial institutions, we have sought opportunities to inform our readers. We have analyzed over 270,000 social media posts from credit unions, banks, digital-forward financial institutions, and finfluencers. With a focus on credit unions, our report provides one of the first comparative analyses of how these financial institutions are faring in their online impact with Gen Z. We also provide actionable strategies to help credit unions effectively engage Gen Z on social media, measure content resonance, and ultimately enhance their financial well-being. Based on the results in our report, credit unions (any business really) will be able to shape content to their desired social media platforms, understand the characteristics of compelling content, and employ

strategies used by other major players, such as finfluencers and digitally native financial institutions, to achieve social media success.

**Nitya Singh**

Associate Professor & Chair, Department of Management, Salisbury  
University, USA

## **The Institutional Paradox: Stability, Power, and Change in Emerging Political Economies**

This paper examines how political stability moderates the developmental and distributive effects of Foreign Direct Investment (FDI), offering direct implications for multinational corporations (MNCs) operating in increasingly complex global environments. Against the backdrop of rising authoritarianism, democratic backsliding, and renewed debates about the political foundations of economic development, the study asks whether political stability genuinely delivers inclusive outcomes or instead conceals institutional vulnerabilities that shape inequality, human development, and strategic risk for MNCs. While political stability is widely assumed to create a favorable climate for investment, this paper argues that the relationship is more nuanced. Stability may reduce uncertainty and facilitate long-term planning for firms, but its developmental payoffs depend heavily on the quality of governance and the presence of institutions capable of distributing gains broadly across society.

To investigate these dynamics, the paper adopts an interdisciplinary framework that integrates theoretical and empirical insights from Economics, International Business, and Political Science. We employ a time-series dataset derived from publicly available international sources to test hypotheses linking FDI inflows to two key developmental outcomes—inequality, measured through the Gini coefficient, and human development, assessed via the Human Development Index (HDI)—conditional on varying levels of political stability. The empirical strategy enables us to identify not only whether FDI contributes to development, but also how the institutional environment shapes the direction and magnitude of these effects over time.

In addition to the quantitative analysis, the paper incorporates comparative evidence from India and Mexico to illustrate how the interaction between FDI and political stability differs across emerging-market contexts. India's long-standing democratic institutions, despite episodes of political volatility, have generally enabled more transparent regulatory processes and stronger civil-society oversight. These factors can enhance the developmental spillovers of FDI, particularly in technology-intensive sectors. Mexico, by contrast, exhibits periods of institutional fragility linked to security challenges and uneven

governance capacity, which create opportunities for elite capture and limit the broader distribution of FDI gains. These contrasting cases underscore that stability alone does not determine developmental outcomes; the nature and inclusiveness of the underlying political institutions matter significantly.

Our findings indicate that political stability tends to reduce operational risk for MNCs by supporting macroeconomic predictability, policy continuity, and a more conducive environment for long-term investment. However, the developmental benefits of stability are uneven. In countries lacking robust redistributive institutions, FDI may reinforce existing inequalities even when the macro-political environment appears stable. Conversely, in contexts of instability, the risks of elite capture, corruption, and weakened regulatory oversight intensify, diminishing the developmental impact of FDI and amplifying reputational and operational risks for firms.

Overall, the study advances political risk analysis for emerging-market entry by demonstrating that political stability is necessary – but not sufficient – for generating sustainable and inclusive FDI outcomes. It emphasizes the need to consider institutional inclusiveness, governance quality, and the sectoral composition of FDI when evaluating long-term opportunities and risks. For both scholars and managers, the framework offered here provides a strategic lens through which to align investment decisions with equitable and sustainable development trajectories in host countries.

**Radmila Stevanovic**

PhD Student, University of Belgrade, Serbia

&

**Miloš Milosavljević**

Professor, University of Belgrade, Serbia

## **The Evolution of Influencer Credibility Dimensions in the Skincare Industry: A Systematic Literature Review (2020–2026)**

The skincare market has experienced a structural transformation in recent years, shifting from an industry primarily driven by aesthetics toward one increasingly shaped by scientific literacy, ingredient transparency, and consumer education. As consumers have become more attentive to product ingredients and efficacy, digital platforms have emerged as critical spaces for information exchange. Within this ecosystem, social media influencers (SMI) play a pivotal role—not merely as promoters, but as intermediaries whose credibility significantly affects consumer decision-making processes.

This paper presents a systematic literature review of skincare influencer credibility dimensions, covering the period from 2020 to 2026. The objective is to synthesize contemporary research findings and identify how traditional credibility dimensions have evolved within digitally mediated environments. The study draws upon peer-reviewed journal articles indexed in major academic databases and applies a structured selection and screening process to ensure methodological rigor.

The review categorizes existing research across core credibility dimensions, including knowledge, relatability, helpfulness, self-confidence and articulation. Particular attention is given to how these dimensions have been reconceptualized in recent literature. The paper further examines how these credibility dimensions interact with stages of the consumer decision-making process, from need recognition to post-purchase evaluation, thereby explaining variations in persuasive effectiveness among influencers.

The study contributes to the literature by integrating fragmented findings into a consolidated conceptual framework of influencer credibility tailored to the skincare industry. It also highlights research gaps relevant to emerging markets, particularly Southeast Europe, where empirical data on the relationship between influencer credibility and purchase intention remain limited. By offering a structured credibility map, this paper provides a foundation for future empirical

research and practical guidance for marketing strategists operating in increasingly knowledge-driven consumer environments.

**Codruta Simona Stoica**

Professor, "Aurel Vlaicu" University of Arad, Romania

## **On Algebraic Behaviors in the Stability Theory**

The traditional idea of polynomial stability pertains to systems whose trajectories or energies decrease to zero at a rate comparable to a negative exponent of time. Although this terminology is common in the theories of evolution equations, operator theory, and semigroup literature, in this work we utilize the term algebraic stability, emphasizing the power-law nature of the decay. This perspective places algebraic stability naturally between two established asymptotic regimes: exponential stability, characterized by solutions that diminish at a consistent geometric rate, and sub-exponential stability, which encompasses polynomial or algebraic rates and even slower decay rates like logarithmic decay.

This study aims to develop a framework for characterizations within a cohesive nonuniform context for the algebraic stability of dynamical cocycles. Specific generalizations concerning the results obtained earlier for skew-evolution semiflows are demonstrated within the nonuniform context of dynamical cocycles.

**Szabolcs Szekeres**

Member, Hungarian Economics Association, Hungary

**Social Discount Rate Dilemmas in Benefit-Cost Analysis**

Because discounting both imputes the capital costs of investment projects and intertemporally weighs their benefits, no project-independent discount rate can perform both functions to everyone's satisfaction. Discounting by the Social Time Preference Rate (STPR) results in undervalued capital costs, while discounting by the Social Opportunity Cost Rate (SOCR) results in undervalued future benefits – at least in the eyes of those making the opposite choice, as generally  $STPR < SOCR$ . A two-rate discounting method is proposed that uses the SOCR only to compute capital costs but not to discount net benefits, and uses the STPR only to discount net benefits but not to compute capital costs. If there is agreement on the value of the SOCR, there will be agreement on which projects are feasible, because no project that is unable to recover capital costs will have net benefits. This brings the two discounting schools to a practical agreement on the important question of project feasibility. Regardless of the value of the STPR, the SOCR is the hurdle feasibility rate. The question left thereafter is how to discount net benefits to compute an appropriate net present value (NPV). The choice depends on the objective of the analysis.

- If the objective is to maximize the allocative efficiency of a public sector budget, then net benefits should be discounted by the SOCR, for that would prioritize projects that convert present resources into net benefits in the most efficient way possible.
- If the objective is to measure the impact of projects on consumers' welfare, then net benefits should be discounted by the STPR. Results of an experimental capital market model corroborate that this is the method whereby consumers' willingness to pay is most accurately measured.

The dilemma thus disappears completely, as the choice of discount rate to be used in this second step becomes unambiguous.

Two-rate discounting is the conceptual equivalent of Social Time Preference discounting with the appropriate shadow pricing of capital (SPC), an adjustment that is seldom undertaken in practice, resulting in overstated NPVs. Two rate discounting is more accurate than conventional SPC adjustment, however, because it correctly measures

the capital use of specific projects rather than relying on economy-wide estimates.

The Ramsey equation, which is currently a common basis for the estimation of the STPR, is a tautology that cannot predict STPRs. This is shown by an experimental capital market model. To measure welfare impact correctly, the STPR should be derived from savers' and borrowers' revealed preferences.

**Henry Thompson**

Emeritus Professor, Auburn University, USA

&

**Alexi Thompson**

Assistant Professor, South Carolina State University, USA

## **Tariffs and Factor Prices with Flexible Energy Supply**

The recent increases in import tariffs mark at least an attempted major change in US trade policy with discretion shifting to the Executive branch and Congress losing authority. The strong energy intensity of US manufactures suggests including energy as a factor of production. Energy as the third factor moves capital to the middle of factor intensity with tariffs on manufactures favoring an increased price of energy and decreased wage. Factor price substitution, however, plays a role along with factor intensity in the adjustments. If capital and energy are complements in production, tariffs could raise the price of energy and diminish demand for capital favoring increased wages. Factor proportions trade theory generally treats factor supplies as perfectly inelastic but also considers perfectly elastic supply. The present paper introduces the intermediate case of upward sloping energy supply. The demand for energy is sensitive to factor prices and output levels with full utilization. Energy supply depends on optimal depletion versus shortsighted income maximization. The general equilibrium theory is simulated with 2023 data for a range of constant elasticity of substitution CES along with sensitivity to weak capital-energy complements. The model is also tested in estimates with annual US data for 1997-2023. The simulations and error correction estimates are compared with flexible, perfectly inelastic, and perfectly elastic energy supplies.

**Ricardo Timaran-Pereira**

Professor, Universidad de Nariño, Colombia

**Jonathan Viveros-Córdoba**

Systems Engineer, Universidad de Nariño, Colombia

&

**Andrés Calderón Romero**

Assistant Professor, Pontificia Universidad Javeriana, Colombia

## **Hybrid Address Normalization Using NLP and Large Language Models for Public Health Geospatial Analysis**

Accurate geolocation of epidemiological records is essential for reliable spatial analysis in public health research. Nonetheless, traditional deterministic geocoding approaches struggle when confronted with informal address formats, misspellings, or syntactic inconsistencies, leading to substantial data loss and reduced analytical quality. This study presents the development of a hybrid address normalization framework integrated into the YACHAY-SIG platform and applied to the Population-based Cancer Registry of Pasto (RPCMP). The proposed architecture operates through a dual-stage workflow. In the initial stage, a PostGIS-based geocoding engine processes addresses that comply with standardized naming conventions. Subsequently, records that remain unresolved are handled by an intelligent recovery layer that incorporates Natural Language Processing techniques and semantic similarity analysis using TF-IDF and Word2Vec embeddings to detect and correct textual inconsistencies. To ensure feasibility in environments with constrained computational resources, supervised fine-tuning was conducted via Low-Rank Adaptation (LoRA) across multiple Large Language Models. Experimental evaluation demonstrated notable gains in normalization and geocoding performance. Among the tested configurations, the Llama-3.2-3B-Instruct model delivered the most consistent results, achieving a normalization accuracy of 99.40%. At the system level, geospatial recovery improved from an initial 33.02% to 55.13%, effectively distinguishing semantic resolution improvements from inherent cartographic limitations of the study area. Overall, the proposed solution enhances the reliability of geospatial analyses in oncological surveillance and introduces a scalable data engineering approach applicable to other public-sector information systems.

**Asdren Toska**

Co-Founder and Director, Toska Electronics, Kosovo

&

**Flokart Aliu**

Professor, University of Prishtina, Kosovo

## **Leveraging AI-Enabled Marketing to Build Dynamic Capabilities in Early-Stage Startups**

This study investigates the role of AI-enabled marketing in early-stage startups, drawing on Dynamic Capabilities Theory and focusing on the constructs of sensing, seizing, and transforming. Existing studies have primarily focused on large firms and performance, leaving aside process-based contexts and the perspectives of startups in the early stages of operation.

The study follows a qualitative interpretive approach, relying on multiple case studies. To answer the research questions, a semi-structured interview was designed and conducted with 10 early-stage startups. The respondents of this study were the founders and co-founders of the early-stage startups.

The findings suggest that AI-enabled marketing mainly strengthens sensing, whereas seizing is more limited due to startups' resource constraints. While transforming (reconfiguring) appears more dominant in the startup context, it is driven by the adaptation and reallocation of resources. An overlap is observed between seizing and transforming. Startups focus more on continuous adaptation than on aggressive exploitation of opportunities.

This study contributes to the literature by extending Dynamic Capabilities Theory with empirical evidence (case-based) in the context of early-stage startups in Kosovo. The study emphasizes that AI not only affects performance but also the development of organizational capabilities, showing that the capacity to transform (reconfigure) capability can be dominant under conditions of limited resources. Additionally, the study provides contextual insights from an emerging market (Kosovo), enabling comparisons with other markets.

**Tzu-wei Tsai**

Professor and Dean, College of Design, National Taichung University  
of Science and Technology, Taiwan

## **From Empathy Mapping to Immersive Experience: Participatory Narrative Design for Emotional Audience Engagement**

This study explores how empathy-driven immersive experience design can enhance emotional audience engagement within the context of experiential communication and socially engaged storytelling. As immersive projection and interactive media technologies become increasingly adopted in exhibitions, brand experiences, and public engagement events, many immersive environments continue to prioritize visual spectacle and technological novelty over emotional resonance and meaningful audience participation. To address this issue, this study proposes a user-centered immersive narrative framework integrating empathy mapping, participatory storytelling, and immersive interaction design.

A graduate-level creative design project, *Reclaiming the Light*, was selected as the primary case study. The project focused on the emotional experiences and psychological trauma associated with abandoned stray dogs. Rather than presenting the issue through conventional informational communication, the project transformed emotional narratives into immersive spatial experiences designed to foster empathy, emotional reflection, and participatory engagement.

During the design process, students first employed Empathy Maps and Journey Maps to investigate emotional states, fears, expectations, and experiential touchpoints related to the subject. These emotional insights were then translated into immersive storyboards, visual sequences, and interactive narrative scenarios. Interactive technologies including Kinect, TouchDesigner, Unity, and Resolume Arena were integrated to create audience-responsive experiences within a 180-degree projection environment.

The immersive installation encouraged audiences to move beyond passive viewing and engage emotionally and physically with the narrative environment. Through spatial projection, interactive visual feedback, and participatory storytelling, audiences were invited to experience emotional tension, isolation, hope, and recovery from the perspective of the narrative subject. Research data included project documentation, student reflective feedback, and audience

questionnaires evaluating emotional engagement, immersive perception, and participatory experience.

The findings indicate that empathy-based design methods can significantly support the transformation of immersive media from technology-centered presentation toward emotionally meaningful audience experiences. Empathy mapping helped students shift from issue-based expression to deeper emotional understanding, while immersive participation enhanced audience involvement and emotional connection. The study further suggests that immersive narrative experiences may function as effective experiential communication strategies capable of strengthening emotional engagement, social awareness, and audience participation.

This research contributes to emerging discussions in experiential marketing and immersive experience design by demonstrating how empathy-driven participatory narratives can support emotionally engaging and socially responsive immersive experiences.

**Long Wang**

Professor, Kennesaw State University, USA

&

**Jun Ji**

Professor, Kennesaw State University, USA

## **Construction of Finite Tight Frames via Singular Value Decomposition**

Finite tight frames are used widely for many applications. An important problem is to construct finite frames containing specified elements as needed in real world applications. In this paper we provide a stable method for such purpose. We establish an identity for constructing equi-norm tight frames from the specified elements and present a method for generating equi-norm tight frame explicitly from the outcome of the singular value decomposition of the matrix of the given elements. Under certain conditions, the number of columns of the unit-norm tight frames generated by our method reaches the minimum bound, improving the result in literature. Finally, we illustrate our method through a numerical example.

**Shuangbao Wang**

Professor & Chair, Department of Computer Science, Morgan State  
University, USA

## **csNavigator: An Agentic AI Application for Enhanced Student Advising and Learning Support**

csNavigator, an innovative agentic AI application, provides 24/7 student advising and support with organizational-specific resources that would otherwise not be possible in generative AI models such as ChatGPT. The application was built on the Google Gemini 3 agentic AI platform. It ingests input with its multi-model approaches so text, image, audio, and video data can be processed at the same time instead of going through separate models, thus improving its reasoning accuracy. The application can also extend its use to corporations and organizations as an internal AI system.

Learning occurs in colleges and universities following a 24/7 cycle, as students have different study schedules. When students need help with their learning, they turn to instructors and teaching or lab assistants. When an issue arises, such as course registration, override requests, course substitutions, or grade inquiries, they usually turn to their advisers or department head. For students, they hope to get answers immediately, no matter if the matter is for learning or to resolve an issue. However, instructors and faculty work on a regular schedule. Few people monitor their classes after working hours. Many put a 24/48 hour response time. This causes a gap between students who need help and how soon they can be helped or advised. Artificial intelligence (AI) is reshaping every major sector of the U.S. economy, creating an urgent national need for educational institutions to equip learners with the skills required to thrive and to lead in an AI-driven world. AI-related careers are among the fastest-growing and highest-demand fields, but employers report persistent shortages of workers with AI competencies.

Developed on Google Gemini 3 agentic AI platform, csNavigator turns input into tokens, feeds tokens into the transformer, predicts the next token, chains prediction into output, thinks using multi-models and routes token to only a specialized subset of the neural network. The thinking phase generates lots of hidden reasoning tokens to simulate the human brain's neuron activities. The results show that only a small portion of neurons are activated, which means less resources are consumed.

The new multi-model approach takes text, images, audio, and videos in ingesting (thinking) processing. Previously, each goes through a

different model, thus reasoning was fragmented instead of a comprehensive approach with unified understanding.

As an innovative agentic AI application, iNavigator.ai improves student success by providing 24/7 advising and support of departmental resources that would otherwise not be possible on generative AI models such as ChatGPT/OpenAI.

The application can also extend its use to corporations and organizations as an internal AI system.

**Yong Wang**

Professor, North China Electric Power University, China

## **Traveling Salesman Problem and Hamiltonian Principle**

The traveling salesman problem (TSP) is a well-known NP-hard problem in combinatorial optimization and closely related to many other NP problems in science and engineering, such as crystallography, gene sequencing, vehicle routing, drilling of printed circuit boards, job sequencing and computer wiring. However, there is a lack of efficient method for computing the optimal Hamiltonian cycle (OHC) and OHC edges. Inspired by the Hamiltonian principle, which is widely applied to various dynamic systems, the variation function of frequency is proposed and computed with the optimal  $i$ -vertex paths for each edge. The probability function was defined based on the frequency for evaluating the optimality of each edge. Moreover, according to the Hamiltonian principle, the frequency and probability of an OHC edge do not change significantly as its weight increases to some extent. A linear function was built to increase the weight of an edge and show the frequency and probability changes. An algorithm is provided to find the OHC edges based on frequency and probability changes. The results demonstrated that more than  $n/2$  OHC edges were found for a TSP instance of size  $n$ . This discovery illustrates that the Hamiltonian principle also works for TSP using edge frequency and probability.

**Nesreen Weshah**

Instructor, Southern Alberta Institute of Technology (SAIT), Canada

**Aghnia Krishti**

Master's Student, University Canada West, Canada

&

**Leonardo Lynch**

Master's Student, University Canada West, Canada

## **Risks of Artificial Intelligence (AI) in Sustainable Construction Management: An AI-Agile Risk Management Framework**

Artificial Intelligence (AI) is increasingly being used in the construction industry to improve sustainability, risk management, and efficiency, reflecting the digital revolution occurring in the sector. However, the use of AI is associated with several risks, such as data privacy issues, algorithmic bias, and excessive dependence on predictive systems. These challenges are particularly evident in sustainable building management, where long-term environmental objectives must be balanced against immediate efficiency gains. While many researchers have discussed sustainability and AI in construction separately, there is a lack of studies that integrate both fields with a strong emphasis on risk management.

This study addresses this knowledge gap by proposing an AI-powered Agile Risk Management Framework for sustainable construction scenarios. AI-related risks include power consumption challenges, overreliance on automation, and privacy violations. Sustainability in construction projects includes environmental effectiveness (e.g., emissions, materials, energy), social fairness, and long-term flexibility. Agile practices considered most relevant include Scrum, iterative feedback loops, and adaptive planning for risk management.

The research question is: in sustainable construction, what are the main risks linked to AI adoption and how can Agile practices help to manage those risks? Hypothesis: In AI-driven sustainable construction projects, the application of the Agile Management Framework significantly enhances risk identification and mitigation.

The methodology for this research follows a mixed-methods design using both qualitative and quantitative approaches. Semi-structured interviews will be conducted with around 15 industry experts such as AI developers, project managers, and sustainability officers, each with five to seven years of experience in construction projects. Experts will be

drawn from professional associations such as PMI and the Canadian Construction Association, to ensure diversity in expertise and reduce selection bias. In addition to the semi-structured interviews, a short survey will be conducted to complement the qualitative results and provide mixed-methods triangulation.

Regarding data collection, primary data will be collected from the interviews, and secondary data from case documents. Thematic analysis will then be conducted using NVivo or MAXQDA. Next, the framework will be developed based on expert input and the literature review. Validation will be conducted through expert interviews in a pilot case study. The anticipated findings from this research include: 1) A comprehensive risk classification of AI applications in sustainable construction, 2) A validated Agile Risk management framework that can guide construction firms and the project managers, and 3) Practical recommendations to balance sustainability within digital construction projects with innovation.

In conclusion, this study aims to provide a structured, adaptable framework that supports safer and more sustainable AI adoption in construction, contributing both practical guidance for industry and a theoretical foundation for future research.

**Evangelos Xevelonakis**

Professor, HWZ Zurich University of Applied Sciences in Business  
Administration, Switzerland

## **Hybrid Topic-Based Sentiment Analysis for Customer Experience Analytics**

Organizations increasingly collect large amounts of unstructured textual data from sources such as customer reviews, service feedback, and social media conversations. Transforming this information into actionable insights for managing customer experience remains a key challenge for marketing analytics.

This study proposes a hybrid analytical framework that combines topic modelling and sentiment analysis to analyse customer feedback systematically. First, semantically coherent topics are identified using embedding-based topic modelling techniques such as BERTopic built on contextual representations generated by BERT. In a second step, sentiment analysis is applied to quantify the emotional orientation of customer feedback within each topic.

This approach enables organizations to identify not only the main themes discussed by customers but also how these themes influence customer experience perceptions. Using real-world customer feedback data, the framework reveals key drivers of customer satisfaction and dissatisfaction, including service quality, pricing perceptions, and delivery performance. The proposed method provides marketing decision makers with a scalable approach to transform large volumes of textual feedback into actionable insights for improving customer experience and supporting data-driven marketing strategies.

**Shahrzad Yaghtin**

Assistant Professor, ESDES Business School, Université Catholique de  
Lyon, France

**Joel Mero**

Associate Professor, University of Jyväskylä, Finland

&

**Teck Ming Tan**

Associate Professor, Oulu Business School, University of Oulu, Finland

**Keep Pace with Blockchain to Witness Transformation in  
B2B Interactions**

The emergence of blockchain technology has been recognized as a critical turning point in organizing business collaborations. Blockchain has proved its remarkable potential to disrupt the traditional methods of business collaborations. Given the specific needs and expectations of business customers and the high switching costs and interdependence that lead to vulnerability between exchange parties, building trust plays an important role in strengthening B2B relationships. In this regard, blockchain technology has shown its huge potential to establish trust and foster authentic B2B interactions. Blockchain technologies can also transform the way B2B organizations perform business by enhancing the likelihood of relational exchange and interactions. In this context, blockchain facilitates buyer-seller contacts by enabling direct transactions using cryptocurrencies, fostering increased levels of disintermediation, and negating the need for reconciliations using smart contracts and private blockchains. Additionally, blockchain can assure firms about the integrity of data and the authenticity of the message content. Furthermore, while many B2B companies experience numerous difficulties in tracking supply through various life cycles, blockchain has shown its remarkable potential to provide novel solutions for the efficient implementation of cross-border supply chains and managing circular supply chains that can lead to value creation for the suppliers, vendors, and other actors, and improve customer satisfaction. Blockchain technology can also be leveraged to foster B2B social interactions by offering the opportunity to organize blockchain-based trade shows and events, as well as leveraging blockchain-based metaverse, and facilitating the formation of B2B communities. Moreover, blockchain can assist companies in creating secure peer-to-peer interactions to foster reciprocal feedback in buyer-seller interactions. However, there is still a lack of understanding within academic literature on how blockchain might affect interactions within B2B ecosystems.

This paper, therefore, seeks to offer preliminary evidence and real-world examples that elucidate how blockchain technology can potentially transform B2B interactions. In this research, we adopt Murphy and Sashi's model, which outlines the main dimensions of interactivity, including buyer-seller contacts, message content, social interaction, and reciprocal feedback in B2B contexts, to introduce blockchain-based solutions that can potentially affect each dimension of interactivity. This article, therefore, offers several important examples of blockchain-based solutions that can transform B2B interactions. Furthermore, the article presents a research agenda that includes critical research questions for encouraging future studies on this important subject. To the best of the authors' knowledge, no previous study has focused on improving B2B interactions by leveraging blockchain-based solutions. The study of this underexplored topic also offers interesting insights for B2B firms to take benefit from opportunities provided by blockchain technology to develop relationships with business customers and other important stakeholders.

**Yie-Jing Yang**

Professor, Shih Hsin University, Taiwan

### **The Influence of Prior Corporate Image and News Valence on Public Perceptions: Halo Effects, Devil Effects, and Perceived Corporate Hypocrisy**

This study examines how prior corporate images and subsequent news exposure shape public perceptions through the halo and devil effects. Based on 258 valid samples, the results indicate that I-Mei, a Taiwanese company with a favorable prior image, elicited a halo effect, whereas Ting Hsin, a Taiwanese company with an unfavorable prior image, experienced a devil effect when exposed to negative news. Further analyses of the halo effect reveal that I-Mei benefited from a benefit-of-the-doubt /shield effect, as well as from both within-domain and between-domain inference effects. In terms of public perceptions, even when respondents were exposed to negative news about I-Mei, their evaluations of I-Mei's CSR image, product perceptions, and purchase intentions remained more favorable than those of respondents exposed to either positive or negative news about Ting Hsin. However, the benefit of the doubt/shield aspect of the halo effect appears to influence only cognitive evaluations, without directly affecting purchasing behavior. The halo effect also has a partial mediating effect.

**Roman Yavich**

Associate Professor, Ariel University, Israel

**What Affects Teachers' Use of Technology?  
Teacher Beliefs Regarding Technology, Teachers'  
Technological Skills, or Available Sources of Support?**

Many studies examine teachers' use of technology, but not many examine what factors promote such use. The current study examines the effect of several factors on technology use by teachers. A questionnaire on this topic was given to 120 male and female teachers from Israel. It was found that teacher beliefs in the effectiveness of technology use in education, as well as support for such use by parents of school students, promote teacher use of technology in education. Teachers' technological knowledge and skills, support from the school management and from Education Ministry supervisors, and the availability of technological support were not found to promote teachers' use of technology in education. It is recommended to conduct programs and workshops that will educate teachers on the usefulness of technology in education and promote parent-teacher cooperation. The study may greatly help to promote the use of technology in teaching and education, which may greatly improve student learning.

**Jinmei Yuan**

Professor, Creighton University, USA

## **The Role of Continuity in Set-Based Thinking: Discovering the Nature of Numbers Taught by the Nine Chapters on Mathematical Art in Ancient China**

Cantor's Set Theory reveals a rich field of transfinite sets, in which both totality and individual objects within the whole could be plurally thought of as a unit. This unit may be either finite or infinite. Time and intuitive understanding gain important positions in the development of human knowledge. Set Theory provides an explicit framework for grasping the nature of numbers.

Ancient Chinese mathematicians excelled at set-based thinking, a skill enhanced by their practice with pictographic characters while engaging in Chinese language games. In dealing with an ever-changing world, understanding the concept of continuity was one of the essential principles practiced by ancient Chinese mathematicians when studying and teaching of numbers. Guided by Cantor's theory of sets, the author of this paper re-evaluates the contributions of Chinese mathematician Liu Hui 劉徽 (fl. 3rd century CE) in his explanation of integers in *The Nine Chapters on Mathematical Art*, one of the oldest texts on applied mathematics in China. The author argues that, without knowledge of modern set theory, ancient Chinese mathematicians practiced set-based thinking and used sets to clearly define positive and negative numbers, as well as the number of zero.

Having analyzed the Chinese concept of numbers, 數 *shu*, from an etymological perspective, the author demonstrates that while Cantor's naive set theory opens health discussions on the foundations of mathematics, Liu Hui had assigned two colors, red and black, as general sets representing positive and negative numbers. He applied these sets in calculations to solve everyday problems related to the nature of numbers many centuries ago. The connotation of the pictographic character 數 *shu* is rooted in the idea of sets. Chinese characters are constructed through sets—the units of radicals. The habit of thinking in sets is cultivated through learning Chinese pictographic characters.

The conclusion of this paper is that, evidently, in the history of learning numbers, practice often precedes theory. Theory of Sets offers valuable insight, with a much better understanding, into reasoning methods of ancient Chinese mathematicians, allowing for a more accurate evaluation of their contributions.

**Maroussa Zagoraiou**

Full Professor, University of Bologna, Italy

**Alessandro Baldi Antognini**

Full Professor, University of Bologna, Italy

**Rosamarie Frieri**

Researcher, University of Bologna, Italy

&

**Sara Cecconi**

Teaching Assistant, University of Bologna, Italy

## **Rethinking Biomarker Cutoffs in Precision Medicine**

Continuous biomarkers play a central role in personalized medicine and enrichment clinical trials, where identifying the subgroup of patients who benefit most from a treatment is essential. Nevertheless, biomarkers are often categorized using data-driven quantiles such as the median, a practice that may compromise both scientific rigor and patient welfare. By adopting the design-based framework recently proposed by Baldi Antognini et al. (2025) for estimating biomarker thresholds on a continuous scale, we examine the ethical and economic consequences of replacing the optimal model-derived cutoff with the empirical median.

Our findings indicate that median dichotomization can substantially misclassify the benefiting subpopulation and it may assign a considerable proportion of patients to the inferior therapy. This ethical cost is particularly concerning in personalized medicine, where individualized decisions are fundamental.

In addition to ethical considerations, threshold selection has important economic implications. For instance, when the more effective treatment is also less costly, optimal model-based thresholds enhance both ethical outcomes and economic efficiency. Conversely, when the superior treatment is more expensive, median-based rules may reduce costs, but at the expense of exposing more patients to suboptimal care, thereby revealing a clear trade-off between economic savings and ethical responsibility.

Our results show that simple empirical dichotomization of continuous biomarkers is not appropriate for modern enrichment strategies. The use of the model-based approach for threshold estimation proposed by Baldi Antognini et al. (2025) better integrates methodological rigor with ethical and economic considerations in personalized clinical research.

## References

- Papanikos GT, Thompson H, Gkounta O (2026) *Economic Theory, Policy & Applications. Abstract Proceedings of the 21<sup>st</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT, Papanikou A (2025) *Economic Theory, Policy & Applications. Abstract Proceedings of the 20<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT, Gkounta O (2024) *Economic Theory, Policy & Applications. Abstract Proceedings of the 19<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Thompson H, Gkounta O (2023) *Economic Theory, Policy & Applications. Abstract Proceedings of the 18<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Thompson H, Gkounta O (2022) *Economic Theory, Policy & Applications. Abstract Proceedings of the 17<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2021) *Economic Theory, Policy & Applications. Abstract Proceedings of the 16<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2020) *Economic Theory, Policy & Applications. Abstract Proceedings of the 15<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2019) *Economic Theory, Policy & Applications. Abstract Proceedings of the 14<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2018) *Economic Theory, Policy & Applications. Abstract Proceedings of the 13<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2017) *Economic Theory, Policy & Applications. Abstract Proceedings of the 12<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2016) *Economic Theory, Policy & Applications. Abstract Proceedings of the 11<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2015) *Economic Theory, Policy & Applications. Abstract Proceedings of the 10<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2014) *Economic Theory, Policy & Applications. Abstract Proceedings of the 9<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2013) *Economic Theory, Policy & Applications. Abstract Proceedings of the 8<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2012) *Economic Theory, Policy & Applications. Abstract Proceedings of the 7<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2011) *Economic Theory, Policy & Applications. Abstract Proceedings of the 6<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.
- Papanikos GT (2010) *Economics. Abstract Proceedings of the 5<sup>th</sup> Annual International Symposium*. Athens: Athens Institute.