The 15th InTraders International Conference On Multidisciplinary Studies Proceeding Book

Editorial Board

Dr. Johana HOLT
Dr. Mihaela POP

InTraders Academic Platform

www.intraders.org

Publisher

Kürşat ÇAPRAZ

The 15th InTraders International Conference On Multidisciplinary Studies
18-19 May 2026 (Hybrid), Universitatea Bioterra, Bucharest, Romania

e-ISBN: 978-625-92035-6-0

Editorial Board

Dr. Johana HOLT, “Titu Maiorescu” University, Romania
Dr. Mihaela POP, “Titu Maiorescu” University, Romania

Publisher

Kürşat Çapraz, Türkiye

The 15th InTraders International Conference On Multidisciplinary Studies Proceeding Book

e-ISBN: **978-625-92035-6-0**
DOI: https://doi.org/10.66793/intraders15proceeding

Edition: First Edition, 14 July 2026, Kırklareli, Türkiye

Language: English

© All rights reserved. The copyright of this book belongs to Kürşat ÇAPRAZ, who published the book according to the provisions of Turkish Law No. 5846—not sold with money. It cannot be reproduced or copied by any electronic or mechanical recording system or photocopy without the publisher's permission. However, a short citation can be done by showing the source. University Libraries and similar public institutions may add books to databases provided they are open and free to access without permission.

The authors allow the Publisher to publish this article under a Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) license. Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) license allows the work to be shared, copied, and reproduced in any size and format other than for commercial use, including re-editing, transforming, and building upon the original work, provided that it is properly cited.

Author(s) has/have; Patent rights, intellectual property rights, including copyright, of the author(s) or, if any, of the author(s) employer are reserved.

InTraders accepts the Open Access Principles outlined in the Budapest Open Access Initiative (BOAI), and accordingly, InTraders provides instant open access to its content, adopting the principle that making scientific publications accessible to researchers will increase the global sharing of knowledge. InTraders has accepted the Budapest Open Access Initiative and allows readers to read, download, copy, distribute, print and use the articles in the book for any legal purpose.

Publisher
Kürşat ÇAPRAZ
InTraders Academic Platform
Sakarya, Turkey
www.intraders.org

Licensed by CC BY-NC 4.0

Evrak Tarih ve Sayısı: 15.04.2026-E.220615

T.C.
SAKARYA UYGULAMALI BİLİMLER ÜNİVERSİTESİ REKTÖRLÜĞÜ
Uygulamalı Bilimler Fakültesi Dekanlığı

2025 AİLE YILI

Sayı : E-95649561-903.07-220615 15.04.2026
Konu : Kongre Düzenleme Kurulunda Görev Alma
(Prof. Dr. Asena BOZTAŞ)

İLGİLİ MAKAMA

Fakültemiz Uluslararası Ticaret ve Finansman Bölümü öğretim üyesi Prof. Dr. Asena BOZTAŞ, 18-19 Mayıs 2026 tarihlerinde Universitatea Romania ev sahipliğinde Bioterra, Bucharest'de gerçekleştirilecek "The 15th InTraders International Conference On Multidisciplinary Studies Kongresi"nde Kongre Düzenleme Kurulunda Üniversitemiz adına Akademisyen Temsilcisi olarak görev almıştır.

Bilgilerinizi ve gereğini arz/rica ederim.

Prof. Dr. Sinan ESEN
Dekan

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Pin Kodu :12122 Belge Takip Adresi : https://ebys.subu.edu.tr/enVision/Validate_Doc.aspx?eD=BS55EV2610&eS=220615
Merkez Mah., Şehit Fahrettin Azak Cad., No:28/3, 54650 Kaynarca, SAKARYA
Telefon No:0 264 616 04 14 Faks No:0 264 616 00 14
e-Posta:ubyo@subu.edu.tr Elektronik Ağ:www.subu.edu.tr
Kep Adresi:sakaryauygulamalibilimler@hs01.kep.tr
Bilgi için: Kubilay GÖKOĞLU
Unvanı: Birim Evrak Sorumlusu

Organizing Committee

Assoc. Prof. Dr. Fatma Fidan	Sakarya University	Türkiye
Rector Prof. Dr. Floarea NICOLAE	Universitatea Bioterra, Bucuresti	Romania
Vice Rector. Dr. Lucian CHIȚULESCU	Universitatea Bioterra, Bucuresti	Romania
Dean, Assoc. Prof. Dr. Liza Alili Sulejmani	International Balkan University	N. Macedonia
Dean, Dr. Cristian DRĂGHICI	Universitatea Titu Maiorescu	Romania
Prof. Dr. ADRIANA SCHIOPOIU BURLEA	University of Craiova	Romania
Lecturer Phd Gabriel UNGUREANU	Universitatea Bioterra, Bucuresti	Romania
Lecturer PhD Daniel ENE	Universitatea Bioterra, Bucuresti	Romania
Prof. Dr. Ramazan Tiyek	Kırklareli University	Türkiye
Assoc. Prof. Dr. Mehtap Demir	Kırklareli University	Türkiye
Assoc. Prof. Dr. Hakan Eygü	Atatürk University	Türkiye
Prof. Dr. Rashmi Gujrati	NAAC Assessor National Assessment and Accreditation Council Bangalore	India
Dr. Marinică Tiberiu Șchiopu	University of Delhi	India
Prof. Dr. Hakan Murat Arslan	Düzce University	Türkiye

Lect. Sobia Hassan	Lahore College for Women University	Pakistan
Assoc Prof. Dr. İnanç Kabasakal	Ege University	Türkiye
Lect. Dr. Mihaela POP	Titu Maiorescu University	Romania
Asst. Prof. Dr. Joanna HERNIK	West Pomeranian University of Technology	Poland
Assoc.Prof. Dr. Vatuiu TEODORA	Titu Maiorescu University	Romania
Lect. Dr. Hina Zahoor	İstanbul Gelişim University	Türkiye
Prof. Dr. Asena Boztaş	Sakarya University of Applied Sciences	Türkiye
Asst. Prof. Huriye Yıldırım Çinar	Van Yüzüncü Yıl University	Türkiye
Lect. Celal ALPDOĞAN	Sakarya University of Applied Sciences	Türkiye
Dr. Ruxandra Victoria PARASCHIV	Titu Maiorescu University	Romania
Lecturer PhD Lucian CHIȚULESCU	Bioterra University	Romania
Lecturer PhD Florentina EREMIA	Bioterra University	Romania
Assistant Lecturer PhD Valerică BÂNDAR	Bioterra University	Romania
Lecturer PhD Razvan Daniel COȚIANU	Bioterra University	Romania
Lecturer PhD Ștefan BOBOC	Bioterra University	Romania

Conference Secretariat		
Kürşat Çapraz	InTraders Academic Platform	Türkiye
Şule ARABACI	Sakarya University	Türkiye
Bianca Maria Buleteanu	University of Medicine and Pharmacy „Victor Babeș", Timișoara	Romania
Lect. Raveenthiran Vivekanantharasa	Faculty of Education, The Open University of Sri Lanka	Sri Lanka
Conference Student Team		
Gamze Aktaş	Sakarya University	Türkiye
Tuğçe Arkat	Sakarya University	Türkiye
Gökçe Demirbaş	Sakarya University	Türkiye
Gökçe Karataş	Sakarya University	Türkiye
Ecem İlayda Şentürk	Sakarya University	Türkiye
Saliha Dilruba ERBAY	Sakarya University	Türkiye
Rabia Çakır	Sakarya University	Türkiye

Advisory Board

Asst. Prof. Dr.	Hina Zahoor	İstanbul Gelişim University, Türrkiye
Asst. Prof. Dr.	Andrijana Bojadzievska Danevska	International Balkan University, Macedonia
Asst. Prof. Dr.	NATALIJA SHIKOVA	International Balkan University, Macedonia
Assoc. Prof. Dr.	ALEKSANDRA PORJAZOSKA KUJUNDZISKI	International Balkan University, Macedonia
Assoc. Prof. Dr.	Ahu COŞKUN ÖZER	Marmara University, Türkiye
Prof. PhD.	SHENER BILALLI	International Balkan University, Macedonia
Assoc. Prof. Dr.	ASENA BOZTAŞ	Sakarya University of Applied Sciences, Turkey
Prof. Dr.	MAGDALENA MIHAI	University of Craiova, Romania
Prof. Phd.	ADRIANA SCHIOPOIU BURLEA	University of Craiova, Romania
Prof. Dr.	CRISTIAN OVIDIU DRAGAN	University of Craiova, Romania
PhD. Faculty Member	TAHİR BENLİ	Muğla sıtkı Koçman University, Turkey
Assoc.Prof.Dr.	TEODORA VATUIU	Titu Maiorescu University Bucharest, Romania
Lect. PhD.	DINUCA ELENA CLAUDIA	Titu Maiorescu University Bucharest, Romania

Scientific Board of InTraders Academic Platform

Prof. Dr.	Mia Torres-Dela Cruz	STI College Baguio, Philippines
Prof. Dr.	**A.Varadaraj**	**Meası Instıtute Of Management, India**
Prof. Dr.	**Berna Balcı İzgi**	**Gaziantep University, Turkey**
Prof. Dr.	**Leena Jenefa**	**Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, India**
Prof. Dr.	**Mohammed Dawabsheh**	**Arab American University, Palestine**
Prof. Dr.	**Svetlana Rastvortseva**	**University HSE, Russia**
Assoc.Prof.Dr.	**Arsena Gjipali**	**University Of Tirana, Albania**
Assoc.Prof.Dr.	**Bernard/Dosti**	**University Of Tirana, Albania**
Assoc.Prof.Dr.	**Rahali Amina Souad**	**Higher school of management, Tlemcen, Algeria**
Assoc.Prof.Dr.	**Clipa Otilia**	**Stefan Cel Mare From Suceava, Romania**
Assoc.Prof.Dr.	**Doriana Dervishi**	**University Of Tirana, Albania**
Prof. Dr.	**Hakan Murat Arslan**	**Düzce University, Turkey**
Assoc.Prof.Dr.	**Ivana Dražić Lutilsky**	**University Of Zagreb, Croatia**
Assoc.Prof.Dr.	**Jeton Mazllami**	**South East European University, Macedonia**
Assoc.Prof.Dr.	**Joanna Hernik**	**West Pomeranian University Of Technology in Szczecin, Poland**
Assoc.Prof.Dr.	**Lidiia Pashchuk**	**Taras Shevchenko National University Of Kyiv, Ukrania**
Assoc.Prof.Dr.	**Ljubisa Stefanoski**	**International Balkan University, Macedonia**
Assoc.Prof.Dr.	**Ljupco Eftimov**	**Ss. Cyril And Methodius University, Macedonia**

Assoc.Prof.Dr.	**Naiana Tarca**	**University of Oradea, Romania**
Assoc.Prof.Dr.	**Savo Ashtalkoski**	**University Fon – R . Macedonia**
Assoc.Prof.Dr.	**Stefan Toma**	**University of Pitesti, Romania**
Assoc.Prof.Dr.	**Esra Çıkmaz**	**Gaziantep University, Türkiye**
Assoc.Prof.Dr.	**Teodora Vatuiu**	**Titu Maiorescu University Bucharest, Romania**
Lecturer PhD	**Johana Holt**	**Titu Maiorescu University Bucharest, Romania**
PhD.Faculty Member	**Abid Rashid**	**The Islamia University Of Bahawalpur, Pakistan**
Prof. Dr.	**Asena Boztaş**	**Sakarya University of Applied Sciences**
PhD.Faculty Member	**Darko Lazarov**	**University Goce Delchev, Macedonia**
PhD.Faculty Member	**Dawid Dawidowicz**	**West Pomeranian University Of Technology in Szczecin, Poland**
PhD.Faculty Member	**Dejan Zdraveski**	**University "St. Kliment Ohridski"-Bitola, Macedonia**
PhD.Faculty Member	**Edgardo Sica**	**University Of Foggia, İtalya**
PhD.Faculty Member	**Faisal Rana**	**Effat University, Jeddah, Saudi Arabia**
PhD.Faculty Member	**Feriyal Aslam**	**Pakistan Institute Of Development Economics, Pakistan**

PhD.Faculty Member	**Irena Ashtalkoska**	**Fon University Skopje, Macedonia**
PhD.Faculty Member	**Irina Badea Raluca**	**University of Craiova, Romania**
PhD.Faculty Member	**İbrahim Taha Dursun**	**Sakarya University**
PhD.Faculty Member	**Liza Alili Sulejmani**	**International Balkan University, Macedonia**
PhD.Faculty Member	**Ljubisa Stefanoski**	**International Balkan University, Macedonia**
PhD.Faculty Member	**Monika Angeloska-Dichovska**	**University St. Kliment Ohridski Bitola, Macedonia**
PhD.Faculty Member	**Nadeem Talib**	**National University Of Modern Languages Islamabad, Pakistan**
PhD.Faculty Member	**Natalija Shikova**	**International Balkan University, Macedonia**
PhD.Faculty Member	**Omar Khalid Bhatti**	**Iqra University, Pakistan**
PhD.Faculty Member	**Satyanarayan Kothe**	**University Of Mumbai, Hindistan**
PhD.Faculty Member	**Suhail/Ghouse**	**Dhofar University**
PhD.Faculty Member	**Umar Hayat**	**University Of Swat**
PhD.Faculty Member	**Vesna Stanković Pejnović**	**Institute for Political Studies, Belgrade, Serbia**
PhD.Faculty Member	**Yurdagül Meral**	**İstanbul Medipol University**
PhD. Lect.	**Biljana Chavkoska**	**International Balkan University, Macedonia**

PhD. Lect.	**Denisa Mamillo**	**European University Of Tirana, Albania**
PhD. Lect.	**Dinuca Elena Claudia**	**Titu Maiorescu University Bucharest, Romania**
PhD. Lect.	**Ertila Druga**	**European University Of Tirana, Albania**
PhD. Lect.	**Madalina-Teodora Andrei**	**Spiru Haret University, Bucharest, Romania**
Assoc Prof. Dr.	**Muhammet Yunus Şişman**	**Kütahya Dumlupınar University**
Assoc Prof. Dr.	**İnanç Kabasakal**	**Ege University**
Lecturer Phd	**Aurel Ion GUGU**	**Bioterra University, Romania**
Lecturer Phd	**Valentina Gabriela LAZIN**	**Bioterra University, Romania**
Lecturer Phd	**Valerica BINDAR**	**Bioterra University, Romania**
Lecturer Phd	**Maria Madalina JURCOVAN**	**Bioterra University, Romania**
Lecturer PhD	**Georgeta BURLACU**	**Bioterra University, Romania**
Lecturer PhD	**Andrei MARIN**	**Bioterra University, Romania**
Lecturer PhD	**Bogdan Marian MITRIC**	**Bioterra University, Romania**

Statement of Responsibility

The legal and scientific responsibility of the manuscripts belongs to the authors. The 15th InTraders International Conference On Multidisciplinary Studies, 218-19 May 2026 (Hybrid), Universitatea Bioterra, Bucharest, Romania, provides the Republic of Türkiye, Council of Higher Education "International Conference" criteria. **The 15th InTraders International Conference On Multidisciplinary Studies** was held on 18-19 May 2026 (Hybrid), Universitatea Bioterra, Bucharest, Romania

Declaration

InTraders herby would like to declare that from all participants coming from Romania, Albania, North Macedonia, Indonesia, India, Pakistan, Chile, Maldives, Kosovo, Uganda, Montenegro, Czech Republic, Azerbaijan, Türkiye and ensuring international academic participation. more than half of the studies belong to countries different than Türkiye and from more than 5 different countries as mentioned above. 27 studies from Türkiye is presented, 50 studies from out of Türkiye is presented by foreign researchers. 65% is from out of Türkiye, 35 % is from Türkiye. It provides the Republic of Türkiye, Council of Higher Education "International Conference" criteria.

Appreciation

I am gratified to have the honour to put forward the vote of thanks to all the Congressional

Coordinators, Congressional Committees, and Authors who provided intensive work performance for the Conference.

InTraders organizes two conferences annually, one in Spring and one in Autumn. All conference proceedings are indexed in the EBSCO and Proquest Ebook databases.

We are member of Crossref: InTraders Academic Platform

The results of our indexing application reports indicate that our conference system has been updated and migrated to an open journal system infrastructure. All studies will be assigned a DOI, and blind peer review and all other processes will be conducted via https://conference.intraders.org/index.php/intraders. The system will automatically and transparently include rejection/acceptance statistics and time statistics. Indexing applications will be resubmitted following these system improvements.

The next event: The 16th InTraders International Conference on Sustainable Global Trade and Economics 26-27 October 2026, Kırklareli University, Babaeski Campus, Türkiye

Düzenlediğimiz tüm kongreler akademik teşvik ve doçentlik başvuru kriterlerini sağlamıştır.

Publishing opportunity in InTraders International Trade Academic Journal (Indexed in TRDizin, EBSCOhost, ERIH PLUS, Sherpa Romeo)

The Congress aims to include papers from academics and private-sector managers. The written language is English.

Thank you for your great work, dear friends. Last, my little motivators, Emre and Yunus ÇAPRAZ, are great….

A beautiful congress with more than international congress criteria is waiting for all of you. I wish to meet you all at these new international conferences…

Kürşat ÇAPRAZ
Secretary of InTraders Academic Platform
www.intraders.org

Aim & Scope

The 15th InTraders International Conference On Multidisciplinary Studies

InTraders aims to be able to publish scientific research of researchers; aims to create a platform that will contribute to academic development and increase the number of qualified academic studies.

Conference main topics

Social Sciences Titles: Sociology, Psychology, Communication Studies, Journalism, Public Relations, Advertising, Social Work, Philosophy, History, Economics, Business Administration, Labor Economics, Human Resources, International, Finance, Econometrics, Political Science and Public Administration, Law, Islamic Economics and Finance, Management Informatics Systems, Health Management, International Trade, Logistics, Sports Science Studies, Sports, Nutrition

Education Titles: Distance Education, Higher Education, Teaching and Learning, E-learning, Lifelong Learning

Health Science Titles: Nursing, Midwifery topics.Engineering Titles: artificial intelligence, software, computer sciences, and industrial engineering topics.

InTraders Conferences is a well-known international that publishes original and scientific research in the field of education and social sciences. The language, science, legal and ethical responsibility of the articles published in the journals belongs to the authors. Articles published in the conference books cannot be used without reference.

Open Access, Copyright, Licensing

The authors allow the Publisher to publish this article under a Creative Commons Attribution-

NonCommercial 4.0 International (CC BY-NC 4.0) license. Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) license allows the work to be shared, copied, and reproduced in any size and format other than for commercial use, including re-editing, transforming, and building upon the original work, provided that it is properly cited.

InTraders accepts the Open Access Principles outlined in the Budapest Open Access Initiative (BOAI), and accordingly, InTraders provides instant open access to its content, adopting the principle that making scientific publications accessible to researchers will increase the global sharing of knowledge.

The author(s) has/have; Patent rights, and intellectual property rights, including copyright, of the author(s) or, if any, of the author(s) employer are reserved.

Publication Policy

1. InTraders Conferences are international, peer-reviewed and scientific conferences. It publishes in accordance with the publication principles listed below.

2. InTraders aims to contribute to the development of science at the national and international levels by creating a platform where scientific studies can be published.

3.InTraders; It publishes original scientific research in the fields of educatona and social scienses topics.

4. InTraders publishes scientific studies in English language.

5. InTraders publishes, it offers all issues in the archive section of its congress pages free of charge to open access; https://www.intraders.org/archive/

6. The author/authors declare and undertake that the article submitted to InTraders for evaluation for publication has not been published, accepted for publication, or sent to another journal for publication, in Türkiye and/or abroad, in Turkish or any other language before.

7. Author(s) has/have; Patent rights, intellectual property rights, including copyright, of the author(s) or, if any, of the author(s) employer are reserved.

8. All legal and scientific responsibilities regarding the content of the articles published in InTraders belong to the author(s).

9. InTraders does not pay royalties for work.

10. InTraders receives registration fee that mentioned in “registration fee“section.

11. InTraders published articles can be quoted by showing the source.

12. InTraders permits readers to read, download, copy, distribute, print and use for any legal purpose the articles in the InTraders Books by citing the source.

13. InTraders undertakes not to publish in violation of publication ethics and all articles submitted to the InTraders are subject to plagiarism/similarity control by the editor.

14. Whether the article submitted to InTraders is covered; The editor checks whether it is uploaded to the system correctly/completely and whether the article is prepared properly.

15. InTraders double-blind referee evaluation system is used. The "positive" opinion of at least two referees is sought for the acceptance of the article for publication. If one of the referees gives a "positive" and the other a "negative" opinion, the article is sent to a third referee. The editor completes the referee evaluation process by sending two "positive" referee opinions to the Editorial Board.

16. The Editorial Board makes the final decision for the publication of all articles that have two "positive" referee opinions.

17. For the articles accepted for publication, a "Certificate of Acceptance for Publication" signed by the editor is sent upon the request of the author.

18. Uses information such as names, titles and e-mail addresses shared on the journal website only for the stated purposes of this InTraders Organization; It is not used for any other purpose or made available to other people.

19. InTraders accepts the Open Access Principles set forth in the Budapest Open Access Initiative. InTraders has accepted the Budapest Open Access Initiative.

20. InTraders is committed to applying publication ethics to the highest standards and to following the practise guide prepared by the Committee on Publication Ethics (COPE: Committee on Publication Ethics).

21. InTraders is licensed under a Creative Commons (CC) Attribution 4.0 International License.

Publication Ethics Statement

InTraders Conferences are international, peer-reviewed and scientific conferences.

InTraders consists of internal and external stakeholders. Internal stakeholders; Boards and authors, while their external stakeholders are readers. Internal stakeholders apply publishing ethics to the highest standards. It implements the standards announced on the InTraders website. It ensures that internal stakeholders comply with the specified criteria. Legal and scientific responsibility belongs to the authors.

InTraders applies publishing ethics to the highest standards. InTraders follows the Code of Conduct and Best Practice Guidelines for Journal Editors and Code of Conduct for Journal Publishers practice guides prepared by the Committee on Publication Ethics (COPE: Committee on Publication Ethics), providing advice on all aspects of publishing ethics.

The primary ethical responsibilities of InTraders editors, reviewers and authors are listed below.

Responsibilities of the Secretariat

The secretariat is responsible for pre-control processes. Preflight operations; It consists of formal compliance of the article with the InTraders standards, grammar check and similarity report processes.

The secretariat distributes the positive articles for the above-mentioned pre-control procedures to the referee board.

The secretariat is responsible for whether the article submitted to the InTraders is uploaded to the system following the formal rules requested. The Secretariat invites the necessary corrections by contacting the author in case of formal inconsistency. The secretariat rejects the articles not completed within the time allowed for the required modifications.

The secretariat checks the article with the similarity program or requests the similarity report from the author. The InTraders contacts the author to revise the papers outside the similarity limits. The Secretariat rejects the article if the necessary corrections are not completed within the specified time. The secretariat checks grammar with language programs. Requests correction for typos. If the necessary modifications are not completed within the time specified by the Secretariat to the author, the article is rejected by the Secretariat.

The preliminary examination of the articles is completed by notifying the referees of the reports of the studies that do not have deficiencies or whose deficiencies are completed.

Editor's Responsibilities

The editor should be responsible for everything published in the InTraders Books. Therefore,

the editor; should continually strive to improve the quality of InTraders; they must defend freedom of expression; they should always be ready to issue corrections, clarifications, rebuttals and apologies if necessary.

When accepting or rejecting an article for publication, the editor has the right to make a final decision considering the article's importance, originality and clarity, as well as the validity of the study and its suitability for the InTraders scope.

The editor should not reverse the acceptance decision for the article unless a severe problem is detected with the article application.

Editors should publish how the peer-review process works in the ınTraders Books and be ready to defend any deviations noticed in this process.

Editors should publish article submission and acceptance dates to the InTraders Books; The deadlines specified in the InTraders web must be respected.

Editors must respond promptly to complaints. There should be other steps that the complainant can take if they are not satisfied with the response.

Editorial decisions should not be influenced by a person's nationality, ethnicity, religious belief, political opinion, gender or race.

Editors should request referees to inform themselves of any conflict of interest before evaluating a work.

Editors should ask the referees to express their opinions on the article's originality and be cautious against plagiarism.

Editors should ensure that the referee's comments are conveyed to the authors in full, as long as they do not contain offensive and insulting remarks.

Editors should refrain from applying to referees who exhibit unsuccessful refereeing, are constantly delayed in their evaluations, or use rude language. They should also inform the publisher to remove referees who display this attitude from the board.

Editors should strive to ensure that the peer-review process is fair and impartial and that reviews are completed on time.

Editors must take necessary action when encountering a situation that does not comply with publication ethics or when an accusation is received. This obligation also covers past issues.

In no way should the editor put forward any implicit or explicit condition in accepting the articles submitted by the authors for publication in the InTraders Books.

The editor should not use any part of the data or reports of submitted and unpublished articles

for his own research.

Referee Responsibilities

The referee contributes to the editorial process by expressing his views for increasing the scientificity of the article and publishing the article. It acts as a referee with the awareness that it contributes to the development of science.

A double-blind referee evaluation system is used in the InTraders Conferences. In this context, referees should not know the authors' identities; authors should not search for identities; should not contact the authors directly.

A referee invited to make a peer review should notify the editor as soon as possible of his decision as to whether he can act as a referee for the relevant article.

Does not have the necessary qualifications to evaluate the article; The referee who thinks or realizes that he cannot give his opinion within the agreed time should immediately inform the editor and withdraw from the refereeing process.

The referee should treat and evaluate the article confidentially. No explanations about the article should be made to others except for what is allowed; The issue should not be discussed.

The referee should evaluate the originality of the article he accepted for consideration.

The referee should evaluate the article according to scientific criteria; should act impartially and consistently throughout the process. He should not make personal criticism and should not use language that is far from courtesy.

The referee should not use the information and/or idea obtained during the evaluation of the article for his own benefit.

Reviewers must clearly and concisely state all comments and/or questions to the authors and/or the article.

Author's Responsibilities

Authors are responsible for everything in the article submitted to the InTraders. Authors should

collect and interpret research data using simple, unbiased and scientific methods. Scientific research should use accurate and undistorted data.

The raw data of the research should be kept by the author; It should be easily accessible during and after the evaluation process.

The author should not submit a simultaneous article to more than one place. Likewise, the author should not submit any published article to another places for review.

The author should prepare his article following the InTraders writing rules, upload it to the InTraders as desired, and follow the review process closely.

The author should not disaggregate the research results in a way that violates the integrity of the research and should not publish it in more than one issue.

Everyone who contributes to the research should be on the list of authors. Those who do not have active contributions should not be included in the list of authors.

The author should carefully consider the referee's suggestions for the article and make the desired corrections. The author should be able to criticize the referee's recommendations within the limits of courtesy.

The author must guarantee that the works submitted are original. If the author has used the work of others in his research, he should clearly show them in his study using an appropriate citation method. The author should avoid all forms of plagiarism and the possibility of plagiarism.

The author must be able to present all relevant information regarding the requested article and make the requested corrections promptly.

The author knows that he/she cannot withdraw the article that has been given acceptance information. The report cannot be requested to be removed for any reason after the acceptance notification. The final decision is made by the Editorial Board**.**

The 15th InTraders International Conference On Multidisciplinary Studies 18-19 May 2026 (Hybrid), Universitatea Bioterra, Bucharest, Romania, Accepted List & Program

Goup A 09:00-09:40 18 May 2026

Keynote Speakers	**Prof. Dr. Tulus Suryanto, Universitas Islam Negeri Raden Intan Lampung, Indonesia**
	Dr. Instructor Sobia HASSAN, Lahore College For Women University, Pakistan
	Asst. Prof. Dr. Miheala POP, Titu Maiorescu University, Romania
	Dr. Bîndar Valerică, Bioterra University from Bucharest, Romania
	Dr. Gugu Aurel Ion, Bioterra University from Bucharest, Romania

No	Author	Title	University	Country
Goup A 10: 00-!0:50 18 May 2026 Session Manager: Prof. Dr. Asena Boztaş				
72	Matei-Cernăianu Alice Dalina, MateiCernăianu MarioAlbert	WEAKNESSES IN THE FUTURE ECONOMY	Titu Maiorescu University", Politehnica University,	Romania
2	Prof. Dr. Asena BOZTAŞ	Environmental Diplomacy and Circular Economy: A New Foreign Policy Tool for States	Sakarya University of Applied Sciences	Türkiye
3	Haris Muminovic, Andrijana Bojadjievska Danevska,Fatime Ziberi	Financial Insecurity: Fostering or hindering Personal Growth and Engagement	University of Donja Gorica, Podgorica, Montenegro, International Balkan University	Montenegro, N. Macedonia
4	Ali Mustofa, Lect. Erike Anggraeni	Consumption Behavior of Muslim Communities in the Digital Era from the Perspective of Islamic Economic Ethics	Universitas Islam Negeri Raden Intan Lampung	Indonesia

5	Igballe Miftari-Fetishi, Ekrem Destanov, Fatime Ziberi, Sonaj Bilal	Leisure Time Patterns and Management Among University Students: Challenges and Opportunities for Innovative Teaching and Wellbeing Support	International Balkan University, Skopje	N. Macedonia

Goup A 11:00-11:50 18 May 2026 Session Manager: Prof. Dr. Asena Boztaş				
6	Design Engineer Orhan Dedeoğlu, Dr. Ali Osman Güney, Design Engineer, Şenol Çalışkan	A Comparative Study on the Structural Performance of Bus Handrails with Different Wall Thicknesses via Finite Element Method	Orhan Dedeoğlu Karsan Otomotiv Sanayii ve Tic. A.Ş., Bursa Teknik Üniversitesi, Makine Mühendisliği Bölümü,Şenol Çalışkan Karsan Otomotiv Sanayii ve Tic. A.Ş.	Türkiye
7	Dr. Jurcovan Mădălina, Dr. Lazin Valentina	Sodium Nitrite's Impacts on Consumer Health and Food Safety	Bioterra University Bucharest	Romania
8	İrem KARAKURT, Prof. Dr. Hakan EYGU	The Relationship Between Macroeconomic Factors and the Stock Market: An Empirical Study of the United States	Atatürk University	Türkiye
9	Iqbal, Lect. M. Iqbal	Conceptual Framework of Empowerment and Graduation In Islamic Social Finance: A Bibliometric Systematic Review	Universitas Islam Negeri Raden Intan Lampung, Universitas Islam Negeri Raden Intan Lampung	Indonesia
10	Assoc. Prof. Durba Roy, Ashutosh Tripathi	Agri-Food Systems And National Security: A Strategic Analysis For India	I.T.S School Of Management	India
Goup A 12:00-12:50 18 May 2026 Session Manager: Prof. Dr. Asena Boztaş				
22	Asst. Prof. Dr. Hina Zahoor	Human Dignity in Algorithmic Workplaces: Autonomy, Recognition, and Justice in AI-Mediated Management	Istanbul Gelisim University.	Türkiye
12	MEHRAJ HUSSAIN PARA	Chronotopes Of The Future: Temporality, Memory, And Narrative Identıty In Contemporary Science Fiction	Azad College of Arts, Science and Commerce, Rauza Bagh, Chhatrapati Sambhajinagar, Maharashtra	India

13	Ahmad Mufti Salim,Lect. Moh. Bahrudin	Regulatory Governance: Integrating Local Government and Philanthropic Institutions For Sustainable Economic Empowerment	Universitas Islam Negeri Raden Intan Lampung, Universitas Islam Negeri Raden Intan Lampung,	Indonesia
14	Dimas Pratomo, Prof. Dr. Tulus Suryanto	Alternative Income For Higher Education Through Waqf: A Sage Of The Development A Waqf Management Model	UIN Raden Intan Lampung	Indonesia
15	Irini Arapi (Sylari), Eftimi Sylari	Bringing Movement into Reading Lessons: EFL Teachers' Perspectives in Albanian Primary Schools	University of Tirana, Faculty of Foreign Languages	Albania

Goup A 13:00-13:50 18 May 2026 Session Manager: Prof. Dr. Asena Boztaş				
16	Merve İÇÖZ, Döndü Sevimli Güler	Current Approach to Vaginal Birth After Cesarean: Candidate Selection, Counseling, and Shared Decision-Making	Sakarya University, Sakarya University of Applied Sciences	Türkiye
17	Ast. Prof. Dr. Döndü Sevimli Güler, Merve İÇÖZ	Redesigning Antenatal Care: Risk-Adapted, Hybrid, And Midwifery Continuity-Based Models	Sakarya University of Applied Sciences, Sakarya University	Türkiye
18	Prof. Dr. Hakan Murat ARSLAN	A Multi-Criteria Solution Proposal for Office Location Selection Problem in New Generation Working Model: EntropyEDAS Hybrid Approach	Düzce Üniversity	Türkiye
19	Melike Tarancı	Assessment of Occupational Musculoskeletal Risks in the Context of Workplace Ergonomics: A Participatory Ergonomics Approach	Sakarya University	Türkiye
20	Yasemin Yıldız, Assoc. Prof. Dr. Zekiye Turan	Global Fertility Crisis: Causes, Consequences, And Multidimensional Policy Approaches	Sakarya University	Türkiye
Goup A 14:00-14:50 18 May 2026 Session Manager: Prof. Dr. Asena Boztaş				
21	Feride Sevil Koçak	MEANINGFUL WORK	Sakarya University	Türkiye
11	Prof. Dr. Hakan EYGU	The Role of Total Labour Force Participation in Economic Growth in Turkey	Atatürk University	Türkiye
23	Fatma Sena Yıldırım	Challenges Faced by Women from Turkic Republics in the Labor Market: A Research in Sakarya	Sakarya University	Türkiye

24	Tajudeen Sanni, Barbar Ntambirweki, Ampulira Ronald	Free Ports, Blue Carbon, and FPIC: Reconciling Climate Mitigation Projects with Indigenous Public Participation in Coastal Marine Zones	Grotius School of Law, Uganda Pentecostal University	Uganda
25	Marzia Kabir, Asst. Prof. Dr. Murat Ulubay	ORGANIZATIONAL READINESS FOR ADOPTING AI-BASED REPORTING TOOLS: A CASE STUDY OF THE DEPARTMENT OF FISHERIES, BANGLADESH	Ankara Yıldırım Beyazıt University	Türkiye

Goup A 15:00-15:50 18 May 2026 Session Manager: Prof. Dr. Asena Boztaş				
37	Prof. Dr. Asena BOZTAŞ	Circular Economy and International Trade Regimes: Are Green Standards a New Wave of Protectionism?	Sakarya University of Applied Sciences	Türkiye
27	Tamara Roblero, Andrés Soto-Bubert, Prof. Dr. Roberto Acevedo	Recovery Of Rare Earth Elements From Ferric–Apatitic Tailings In Chile: Mineralogy, Extraction Routes, Quantitative Separation, Life-Cycle Performance And Project Economics	Universidad San Sebastián. Santiago	Chile
28	Prof. Dr. Hakan Murat ARSLAN	Performance Evaluation of AI-Powered Assistants: A Hybrid Fuzzy AHPPROMETHEE Approach	Düzce Üniversity	Türkiye
29	Assistant professor, Dr. iur. Sergiu-Catalin OLTEANU	Protection of employees in the event of employer insolvency - an analysis of the rules of the European directive in light of the CJEU case law	Bioterra University, Bucharest	Romania
30	Andrés Soto- Bubert, Rashmi Bhardwaj, Surbhi Sharma, Prof. Dr. Roberto Acevedo	Public Policies, Salt Flats and Lithium Extraction Technologies: Challenges and Perspectives for Energy Transition in South America	Universidad San Sebastián. Santiago, Institute of Mathematics and Applications UK, University, Guru Gobind Singh Indraprastha University, Delhi,	Chile, India, Chile
Goup A 16:00-16:50 18 May 2026 Session Manager: Prof. Dr. Asena Boztaş, Session				
31	Yaren TOZOĞLU, Prof. Dr. Hakan EYGU	An Examination of the Relationship between Employment, Fertility and Higher Education Enrolment in Turkey	Atatürk University	Türkiye

33	Assistant professor, Dr. iur. Sergiu-Catalin OLTEANU	Legal protection of employees in the event of collective redundancies - an analysis of the rules of the European directive in the light of the CJEU case law	Bioterra University, Bucharest	Romania
34	Sena Hatice SARIALTIN, Analyst	A Qualitative Study On Development Of An Integrated Logistıcs Product Model	Independent Researcher	Türkiye
35	Dr. Ayaz Ul Haq	No-Growth Value and Stock Fair Value in Pakistan: Empirical Evidence from Quarterly Data (2013–2025)	CBSR Pakistan	Pakistan
32	Dr. Marinică Tiberiu Şchiopu	Mihai Eminescu's Nature Poetry: An Ecocritical Perspective	Romanian Language Institute, Romania & University of Delhi, India	Romania, India

Goup B 10:00-10:50 18 May 2026 Session Manager: Assoc. Prof. Dr. Tajudeen Sanni,				
73	Prof. Dr. Hakan Murat ARSLAN	Evaluation of Investment Projects in Hybrid Power Plant Installation: A CRITIC-DEMATEL Based Decision Model	Düzce Üniversity	Türkiye
26	Assoc. Prof. Dr. Nikola Dacev	The Impact of Digital Tools on Civic Engagement and Democracy in North Macedonia	International Balkan University	N. Macedonia
38	Lect. Ast. Edita Mustafa	Determinants of Financial Development in North Macedonia	International Balkan University, Skopje	N. Macedonia
39	Yusuf Bactiar, Lect. Mardhiyah Hayati	Islamic Trade Finance and Export Competitiveness in OIC Countries	Raden Intan State Islamic University of Lampung	Indonesia
40	Lect. Mohamed Noordeen Mohamed Imtiyaz	Developing a Sustainable Salam based agricultural financing in Maldives: A Qualitative Inquiry of Stakeholders Perspective	Qasim Ibrahim School of Business, Villa College	Maldives
Goup B 11:00-11:50 18 May 2026 Session Manager: Assoc. Prof. Dr. Tajudeen Sanni				
42	Furkan Nurişah Yalçın, Batuhan Akyıldız,Yusuf Zafer Berber, Dr. Sema Anık	DEVELOPMENT OF A MOBILE APPLICATION FOR ANALYZING ANTHROPOMETRIC DATA OF ADOLESCENTS REGISTERED IN FITNESS CENTERS (FIT GENÇ)****	Özel Kartal Yesevi Vocational and Technical Anatolian High School	Türkiye

43	Serhat Tuna Atalay, Dr. Sema Anık	DIETPRO	Özel Kartal Yesevi Vocational and Technical Anatolian High School	Türkiye
41	Desi Nurhabibah, Lect. Syamsul Hilal	Islamic Financial Literacy and the Financial Behavior of the Digital Generation: A Qualitative Study on the Knowledge–Behavior Gap in the Digital Context	Universitas Islam Negeri Raden Intan Lampung	Indonesia
44	Amelia Anwar, Heni Noviarita	Advanced Islamic Finance Strategies: Accelerating Indonesia's Halal Economic Transformation In The Digital Era	Raden Intan State Islamic University	Indonesia
45	Aishat Nazeeha Mohamed, asst. Prof. Abdulrahman Abubakar	THE IMPACT OF E-GOVERNMENT SERVICE PLATFORMS ON PUBLIC SERVICE DELIVERY EFFICIENCY IN SELECTED LOCAL COUNCILS OF NORTHERN MALDIVES	Qasim Ibrahim School of Business, Villa College	Maldives

Goup B 12:00-12:50 18 May 2026 Session Manager: Assoc. Prof. Dr. Tajudeen Sanni				
46	Assoc. Prof. Dr. İnanç KABASAKAL, Assist. Prof. Dr., Sertaç ÇAKI, Lect. Laman GULIYEVA, İsmayil SHIRINZADE	FINANCIAL OUTLOOK OF THE HOTEL AND SIMILAR ACCOMMODATION SUBSECTOR IN TÜRKİYE: RISK ASSESSMENT USING ALTMAN Z-SCORE MODEL	Ege University,Ege University, Azerbaijan State University of Economics (UNEC). Technical University of Liberec, CZECH REPUBLIC	Türkiye, Türkiye,Azerbaijan, Czech Republic
47	Adolfo Sanjaya1, M. Adam Wijaya, M Yacub Ariya	Islamic Views on Cryptocurrency	Islamic University Raden Intan Lampung State, Bandar Lampung	Indonesia
48	Sinta Bela, Andri Arzali, Wandi, Tejo Waskito	Analysis of Environmental Law Aspects Reviewed from Positive Law and Sharia Maqashid	Sekolah Tinggi Ekonomi dan Bisnis Islam Lampung	Indonesia
49	Dr. Laura Macarovschi	The Issue of Spouses' Partition of Pets THE ISSUE OF SPOUSES' PARTITION OF PETS — A Study in Civil Law and Family Law —	Bioterra University Bucharest	Romania
50	Maya Meilia, Umi Khulsum, Angela Yohana Safitri, Diki Saputra	Sustainable Consumption Behavior: A Planned Behavior Theory Perspective	Sekolah Tinggi Ekonomi dan Bisnis Islam Lampung	Indonesia

Goup B 13:00-13:50 18 May 2026 Session Manager: Assoc. Prof. Dr. Tajudeen Sanni				
51	Assoc. Prof. Dr. Mehtap DEMİR	The Evolution of Collective Bargaining Levels in Türkiye: Institutional Structure and Practical Realities	Kırklareli University	Türkiye
52	Dr. Laura Macarovschi	CONSIDERATIONS ON PARENTAL ALIENATION Family Law Article	Bioterra University Bucharest	Romania
53	Adib Fachri, Lect. Syamsul Hilal	The Role of Green Waqf in Sustainable Development Based on the Sustainable Development Goals (SDGs) in Indonesia	Universitas Islam Negeri Raden Intan Lampung	Indonesia
54	Research Assistant Muhammet Ali Yapıcı	From Evrak-ı Nakdiye to Republican Banknotes: The Credibility of Paper Money in Turkey, 1915–1939	İstanbul University	Türkiye
55	Mutiara Eka Putri, Meilia Risna, Novita, Putri Yolanda, Kiara Basmala Putri, Yuli Saputri	The Development of the Digital Economy: An Analysis of Challenges and Innovation in the Technological Era	Sekolah Tinggi Ekonomi dan Bisnis Islam Lampung	Indonesia

Goup B 14:00-14:50 18 May 2026 Session Manager: Assoc. Prof. Dr. Tajudeen Sanni				
56	Dr. Havva BÖREKCİ ŞAHAN	A Historical Analysis of the USA's Role on the FATF's Evolving Agenda	Ministry of Treasury and Finance	Türkiye
57	Alvena Shahid 1 , Prof. Dr. Roberto Acevedo	Artificial Intelligence-Enabled Smart Systems for Sustainable Healthcare and Environmental Monitoring: Socio-Economic Perspectives	Universidad San Sebastián. Bellavista 7. 8420524. Santiago	Chile
58	Aghesna Rahmatika Kesuma, Samsul Bakri, Ratna Dewi Puspita Sari, Yeni Susanti, Reza Ronaldo, Arsyad Sobby Kesuma	Intersections of Climate Change, Environmental Degradation, and Maternal Health: A Systematic Review of Health System Resilience and Policy Implications	Sekolah Tinggi Ekonomi dan Bisnis Islam Lampung, Lampung University, Lampung, Ushuluddin Faculty, Raden Intan Lampung State Islamic University	Indonesia
59	Asst.Prof. Dr. Hatice Sarıaltın	The Onboarding Process in New-Generation Human Resource Management: A Phenomenological Study	Sakarya University of Applied Sciences	Türkiye

60	Assoc. Prof. Dr. Sezen Ismail	Consumer Anxiety and the Performance of Identity in George Saunders' The Semplica-Girl Diaries	International Balkan University	N. Macedonia
Goup B 15:00-15:50 18 May 2026 Session Manager: Assoc. Prof. Dr. Tajudeen Sanni				
61	Anas Malik, Lect. Ruslan Abdul Ghofur	Construction of Economic Justice Values in an Islamic Perspective on the Economic Practices of Urban Muslim Communities	Universitas Islam Negeri Raden Intan Lampung	Indonesia
62	Assoc. Prof. Dr. Mehtap DEMİR	The Conceptual Limits of Sectoral Trade Union Organization: The Case of Türkiye	Kırklareli University	Türkiye
63	Rifal Rinaldi, Pertiwi Utami, Anjali Sriwijbant	Analysis of Obstacles and Strategies for Implementing Financial Technology in Islamic Banking Services: A Case Study of BSI KC Jakarta Saharjo, South Jakarta	Sekolah Tinggi Ekonomi dan Bisnis Islam Lampung	Indonesia
64	Assistant professor, Dr. iur. Sergiu-Catalin OLTEANU	Protection of employees in the event of a transfer of the undertaking - an analysis of the rules of the European directive in the light of the CJEU case law	Bioterra University, Bucharest	Romania
65	M. Iqbal, Lect. Evi Ekawati	Development of Alternative Financing Models in Islamic Banking for Halal Micro, Small, and Medium Enterprises (MSMEs) in Indonesia	Raden Intan State Islamic University of Lampung, Universitas Islam Negeri Raden Intan Lampung	Indonesia

Goup B 16:00-16:50 18 May 2026 Session Manager: Assoc. Prof. Dr. Tajudeen Sanni				
66	Mudzakir Ilyas, Lect. Moh. Bahrudin	The Role of Islamic Boarding Schools and Higher Education Institutions in Developing A Community-Based Halal Industry Ecosystem	Universitas Islam Negeri Raden Intan Lampung	Indonesia
67	Mihaela POP	Cross-Border Data Processing by Artificial Intelligence and the Efficiency of EU Legal Norms	"Titu Maiorescu" University	Romania
68	Dr. Sheenu Arora, Dr. Namita Mishra	Artificial Intelligence and Sustainable HRM: Transforming Workforce Management for the Future	Tecnia Institute of Advanced studies, New Delhi, I.T.S School of Management	India

69	Trian Hermawan, Nurani, Muhammad Akmansyah	Integrated Islamic Educational Organizing Model: Integrating Sharia Sources, Organization Theory, and Educational Governance	Universitas Islam Negeri Raden Intan Lampung	Indonesia
70	Gülgün ÇİĞDEM, Funda KARA, Şule EKUKLU	The Impact of Global Economic Policy Uncertainty (GEPU) on Türkiye's Macroeconomic Dynamics: A VECM Approach	İstanbul Gelişim University	Türkiye
Goup B 17:00-17:40 18 May 2026 Session Manager: Assoc. Prof. Dr. Tajudeen Sanni, Session				
71	Ariyanto, Moh. Fakhrurozi, Multi Rahmah, Nurul Ulfa Kurnia Annisa, M. Djidin	Digital Transformation of Islamic Microfinance (BMT) and Its Impact on Financial Inclusion in Indonesia	Sekolah Tinggi Ekonomi dan Bisnis Islam Lampung, Institut Teknologi dan Bisnis Diniyyah Lampun	Indonesia
1	Dr. Ezgi Doğan, Prof. Dr. Burhan Doğan	The Behavioural Impact of Inflation Expectations on the Consumer Confidence Index in Turkey: An Econometric Analysis	Yuksek Ihtisas University, Anadolu University	Türkiye
36	Dr. Albana Jeminaj	Sustainable Development, Digital Society, Human Values and the Future of Knowledge	Infinitive Academy	Kosova
74	Antonius EFTENOIU	Interferences Between Tax Law and Insolvency Proceedings: The Limits Between Tax Optimization Practices and the Principle of Good Faith	Universitatea Titu Maiorescu, Faculty of Law and Economic Sciences – Târgu Jiu	Romania
75	Dr. Dumitru Dinu	THE PARTICULARITIES OF ADMINISTRATIVE CONTROL IN ROMANIA	Bioterra University Bucharest	Romania
76	Dr. Bindar Valentin	CRIME PREVENTION IN THAILAND AND ROMANIA Comparative criminological analysis	Bioterra University Bucharest	Romania
77	Dr. Gugu Aurel Ion, Munteanu Florin Cristian	GRAPHOSCOPY AND THE MAIN FEATURES OF HANDWRITING	Bioterra University Bucharest	Romania

Keynote Speaker

Prof. Dr. Tulus Suryanto, Universitas Islam Negeri Raden Intan Lampung, Indonesia

Dr. Instructor Sobia HASSAN, Lahore College For Women University, Pakistan

Asst. Prof. Dr. Miheala POP, Titu Maiorescu University, Romania

Dr. Bîndar Valerică, Bioterra University from Bucharest, Romania

Dr. Gugu Aurel Ion, Bioterra University from Bucharest, Romania

Best Paper Awards

Tamara Roblero, Andrés Soto-Bubert, Prof. Dr. Roberto Acevedo RECOVERY OF RARE EARTH ELEMENTS FROM FERRIC–APATITIC TAILINGS IN CHILE: MINERALOGY, EXTRACTION ROUTES, QUANTITATIVE SEPARATION, LIFE-CYCLE PERFORMANCE AND PROJECT ECONOMICS Universidad San Sebastián. Santiago Chile

M. Iqbal, Lect. Evi Ekawati Development of Alternative Financing Models in Islamic Banking for Halal Micro, Small, and Medium Enterprises (MSMEs) in Indonesia Raden Intan State Islamic University of Lampung, Universitas Islam Negeri Raden Intan Lampung Indonesia

Assistant professor, Dr. iur. Sergiu-Catalin OLTEANU Protection of employees in the event of a transfer of the undertaking – an analysis of the rules of the European directive in the light of the CJEU case law Bioterra University, Bucharest, Romania

Dr. Havva BÖREKCİ ŞAHAN A Historical Analysis of the USA's Role on the FATF's Evolving Agenda Ministry of Treasury and Finance Türkiye

Assoc. Prof. Durba Roy, Ashutosh Tripathi Agri-Food Systems And National Security: A Strategic Analysis For India I.T.S School Of Management, India

Young Researcher Incentive Awards

Yasemin Yıldız, Global Fertility Crisis: Causes, Consequences, And Multidimensional Policy Approaches, Sakarya University, Türkiye

Sena Hatice SARIALTIN, Analyst, A Qualitative Study On Development Of An Integrated Logistıcs Product Model, Independent Researcher, Türkiye

Contents

Organizing Committee 1
Advisory Board 4
Scientific Board of InTraders Academic Platform 5
Statement of Responsibility 9
Declaration 9
Appreciation 9
Aim & Scope 10
Conference main topics 11
Open Access, Copyright, Licensing 11
Publication Policy 12
Publication Ethics Statement 13
Responsibilities of the Secretariat 14
Editor's Responsibilities 14
Referee Responsibilities 16
Author's Responsibilities 16
Conference Program 17
Keynote Speaker 27
Best Paper Awards 27
Young Researcher Incentive Awards 28
Contents 29
Bringing Movement into Reading Lessons: EFL Teachers' Perspectives in Primary Schools in Tirana, Albania 31
Irini Arapi(Sylari), Eftimi Sylari
Mihai Eminescu's Nature Poetry: An Ecocritical Perspective 48
Marinică Tiberiu Şchiopu
REDESIGNING ANTENATAL CARE: RISK-RESPONSIVE, HYBRID, AND CONTINUITY-BASED MIDWIFERY MODELS. 60
Döndü Sevimli Güler , Merve İçöz
The Behavioural Impact of Inflation Expectations on the Consumer Confidence Index in Turkey: An Econometric Analysis 68
Ezgi Doğan, Burhan Doğan
Financial Insecurity: Fostering or hindering Personal Growth and Engagement 76
Haris MuminovicAndrijana Bojadjievska Danevska Fatime Ziberi

Human Dignity in Algorithmic Workplaces: Autonomy, Recognition, and Justice in AI-Mediated Management 91

Hina Zahoor

The Impact of Macroeconomic Factors on Stock Prices in the US Economy: ARDL Bounds Test and Toda-Yamamoto Causality Analysis 105

İrem KARAKURT, Hakan EYGU

Leisure Time Patterns and Management Among University Students: Challenges and Opportunities for Innovative Teaching and Wellbeing Support 114

Igballe Miftari-Fetishi, Ekrem Destanov, Fatime Ziberi, Sonaj Bilal

Protection of employees in the event of employer insolvency - an analysis of the rules of the European directive in light of the CJEU case law 133

Sergiu-Cătălin OLTEANU

Legal protection of employees in the event of collective redundancies - an analysis of the rules of the European directive in the light of the CJEU case law 142

Sergiu-Cătălin OLTEANU

Protection of employees in the event of a transfer of the undertaking - an analysis of the rules of the European directive in the light of the CJEU case law 149

Sergiu-Catalin OLTEANU

The Role of Total Labour Force Participation in Economic Growth in Turkey 158

Hakan EYGU

Cross-Border Data Processing by Artificial Intelligence and the Efficiency of EU Legal Norms 166

Mihaela POP

A Comparative Study on the Structural Performance of Bus Handrails with Different Wall Thicknesses via Finite Element Method 179

Ali Osman Güney Orhan Dedeoğlu Şenol Çalışkan

The Effects of Fertility and Higher Education Enrollment on Employment in Turkey: An ARDL Analysis for the Period 2001–2022 197

Yaren TOZOĞLU, Hakan EYGU

THE GLOBAL FERTILITY CRISIS: CAUSES, CONSEQUENCES, AND MULTIDIMENSIONAL POLICY APPROACHES 208

Yasemin Yıldız, Zekiye TURAN

CURRENT APPROACHES TO VAGINAL BIRTH AFTER CESAREAN SECTION: CANDIDATE SELECTION, COUNSELING, AND JOINT DECISION-MAKING 216

Merve İÇÖZ , Döndü Sevimli GÜLER

Bringing Movement into Reading Lessons: EFL Teachers' Perspectives in Primary Schools in Tirana, Albania

Irini Arapi(Sylari)[1], Eftimi Sylari[2]

DOI: https://doi.org/10.66793/intraders15proceeding1

Abstract

Maintaining students' attention during reading activities remains a persistent challenge in primary English as a Foreign Language (EFL) classrooms. When attention declines, learners often struggle to process and interpret written information effectively. Recent educational and cognitive research highlights the potential of integrating physical movement into classroom instruction as a means of supporting engagement and mental readiness for learning.

This study explores how movement-based strategies are perceived by primary school EFL teachers in Tirana, Albania when incorporated into reading instruction. Using a structured questionnaire, the research examines teachers' experiences with integrating physical activity into reading lessons, the contexts in which these strategies are applied, and their perceived influence on learners' engagement and comprehension.

The results indicate that teachers generally associate purposeful movement with improved classroom engagement and greater student focus during reading tasks. Activities such as role-play, gesture-based interaction, and short physical exercises were commonly perceived by teachers as supportive of sustained attention and text understanding. Teachers also report that these strategies contribute to a more dynamic classroom environment and encourage active participation in reading-related activities.

The findings suggest that movement-integrated instruction may represent a valuable pedagogical approach for supporting reading comprehension in primary EFL settings. Incorporating physical engagement into language lessons may help create learning conditions that promote concentration and deeper interaction with texts. Further investigation using classroom-based observational and experimental methods could provide additional insight into the long-term impact of such practices on reading development.

Keywords: movement-based learning, reading comprehension, attention, EFL classrooms, primary education, Tirana, Albania

INTRODUCTION

Reading comprehension is a fundamental component of foreign language learning and plays a central role in the development of literacy skills among young learners. In primary EFL classrooms, reading activities provide opportunities for students to expand vocabulary, develop language awareness, and engage with meaningful texts. However, sustaining learners' attention during reading lessons is often difficult, particularly when instructional

[1]PhD candidate/ EFL teacher, Department of English Language, Faculty of Foreign Languages, University of Tirana, Albania irini.arapi.fgjhdr@unitir.edu.al ORCID ID: 0009-0006-7073-0756
[2]EFL teacher, Department of English Language, Faculty of Foreign Languages, University of Tirana, Albania eftimisylari@gmail.com

activities are repetitive or require prolonged periods of passive participation.

Over the last decade, interest has grown in the relationship between physical activity and learning. Educational researchers have examined how movement can influence attention, engagement, and classroom behavior, while cognitive scientists have explored the connections between bodily activity and mental processes. This growing body of research challenges the traditional assumption that learning occurs primarily through sedentary classroom work and suggests that physical engagement can play a meaningful role in supporting cognitive performance.

Within language education, movement is commonly incorporated through activities such as role-play, storytelling, gesture-supported communication, vocabulary enactment, and movement-based games. These approaches are particularly relevant for young learners, who often benefit from interactive and multisensory learning experiences. Rather than functioning solely as classroom energizers, movement activities can become part of the instructional process itself by helping learners interact with language in more active ways.

Although research on physically active learning has expanded substantially during the past decade, much of the existing literature has concentrated on measuring student outcomes such as attention, cognitive performance, and academic achievement. Comparatively less attention has been given to teachers' perspectives regarding how movement-based approaches are implemented within everyday classroom practice. This limitation is particularly evident in EFL reading instruction, where teachers play a central role in adapting instructional strategies to the realities of curriculum requirements, classroom management, and learner needs. Furthermore, little empirical evidence exists regarding how Albanian primary school teachers perceive movement-integrated reading instruction. Consequently, important questions remain concerning the practical feasibility, perceived effectiveness, and contextual challenges associated with movement-based learning in Albanian EFL classrooms. By addressing this gap, the present study contributes both local and international insight into the implementation of physically active learning.

This study explores how primary school EFL teachers in Tirana perceive movement-integrated reading instruction. Specifically, it examines how teachers describe the influence of movement on student attention and participation, the ways in which movement activities are incorporated into reading lessons, and the challenges associated with their use. By focusing on teachers' experiences rather than student outcomes, the study contributes to a better understanding of how movement-based approaches are interpreted and applied within Albanian primary education.

The study is guided by the following research objectives:

1. To examine teachers' perceptions of the relationship between physical movement, student attention, and reading engagement.
2. To identify the movement-based activities most commonly used during reading instruction.
3. To explore the practical challenges teachers encounter when implementing movement-integrated learning in primary EFL classrooms.

LITERATURE REVIEW

Physical Activity and Cognitive Function

Interest in the relationship between physical activity and learning has increased considerably over the years. Researchers from education, psychology, and neuroscience have examined whether movement can influence cognitive processes that support academic performance, including attention, memory, and executive functioning. While findings are not entirely consistent, a substantial body of research suggests that physical activity can contribute positively to children's readiness to learn.

Recent European research has further emphasized the growing importance of physically active learning as an educational approach capable of integrating movement and academic instruction within everyday classroom practice (Bailey et al., 2023). Several studies have reported improvements in attentional control and cognitive performance following physical activity. Earlier classroom-based research also demonstrated that brief movement interventions can increase students' on-task behavior during lessons, suggesting that physical activity may support attentional readiness in educational settings (Mahar et al., 2006). Hillman et al. (2009), for example, found that a brief period of aerobic exercise improved aspects of cognitive control among school-aged children. Similarly, classroom-based interventions reviewed by Donnelly et al. (2016) indicated that physically active learning environments may support both cognitive functioning and academic engagement.

At the same time, evidence regarding academic achievement is less conclusive. Some investigations have reported positive effects on learning outcomes, while others have found stronger effects on classroom behavior and attention than on academic performance itself. Syväoja et al. (2022) argue that the relationship between physical activity and achievement is influenced by multiple factors, including the nature of the activity, implementation quality, and characteristics of the learning environment. Recent systematic reviews and meta-analyses likewise report generally positive effects of physically active lessons on student engagement, physical activity, and selected academic outcomes, although the magnitude of these effects varies considerably across studies and educational settings (Norris et al., 2020; Watson et al., 2019). These findings further support the view that movement can contribute to learning, while highlighting the importance of implementation quality and instructional design.

One important distinction emerging from this literature concerns the difference between movement that is integrated into instruction and movement that occurs independently of academic tasks. Activities that require students to engage physically with learning content appear to produce stronger educational outcomes than general activity breaks. Mavilidi et al. (2018) suggest that movement is most effective when it contributes directly to the learning process rather than functioning solely as a means of increasing physical activity.

Taken together, existing research indicates that movement can support conditions associated with effective learning, particularly attention and engagement. However, current evidence does not support a simple conclusion that physical activity automatically leads to improved academic performance. The educational value of movement appears to depend largely on how it is incorporated into classroom instruction.

Movement-Based Learning in EFL Classrooms

Movement has long been used in language teaching, particularly through Total Physical Response (TPR), introduced by Asher (1969). TPR is based on the idea that comprehension develops before production and that physical responses can strengthen language learning and memory.

Today, movement-based instruction extends beyond TPR to include role-play, dramatization, gestures, collaborative games, and storytelling. Research suggests that integrating movement into learning tasks can enhance participation and collaboration (Shoval, 2011), making it especially valuable in primary EFL classrooms.

Studies generally associate movement-based activities with greater motivation, engagement, and participation. However, researchers differ on whether these benefits result mainly from increased enjoyment and motivation or from improved comprehension and memory. Evidence also suggests that movement is most effective when directly linked to learning objectives, such as acting out stories or vocabulary, rather than serving only as a break from instruction.

Despite growing research on physically active learning, teacher perspectives remain limited, particularly in Albania, where little research has explored the practical implementation of movement-based teaching in EFL classrooms.

Movement and Reading Development

Reading instruction provides an important context for examining movement-based learning because successful reading requires attention, comprehension, and active meaning-making. Several studies have reported positive links between physical activity and reading-related outcomes. For example, Álvarez-Bueno et al. (2017) and Haapala et al. (2017) found associations between physical activity, cognitive functioning, and academic achievement, while Mullender-Wijnsma et al. (2016) reported improved achievement following physically active language lessons.

However, findings remain mixed because studies use different measures of reading success, including achievement, motivation, participation, and attention. Research also suggests that movement is most effective when integrated directly into academic content rather than used solely as general exercise (Duncan et al., 2021). In reading instruction, this may include dramatization, vocabulary enactment, and story-based activities.

Despite encouraging results, many studies have been conducted under controlled conditions, and the mechanisms through which movement influences reading remain unclear. While some research reports gains in comprehension and literacy outcomes, others identify stronger effects on motivation and attentional behavior. These inconsistencies highlight the need to examine teachers' perspectives on the practicality and effectiveness of movement-based reading activities in authentic classroom settings.

Teacher Perspectives and Classroom Context

Educational innovations are ultimately implemented by teachers. As a result, understanding teacher perspectives is essential when evaluating the potential of movement-based learning. Even instructional approaches supported by research may face challenges when applied within classrooms characterized by limited resources, large class sizes, or rigid curricular structures.

Teachers often balance competing priorities, including curriculum coverage, classroom management, assessment demands, and student engagement. Decisions about whether and how to incorporate movement are therefore shaped by practical considerations as well as pedagogical beliefs. Previous research has shown that teachers may support active learning in principle while expressing concerns about time, space, and classroom control.

These issues are particularly relevant in primary education, where movement activities can increase noise levels and require greater organizational effort. At the same time, younger learners may benefit most from opportunities for active participation, creating a tension between instructional goals and practical constraints.

In Albania, educational reforms have increasingly emphasized student-centered approaches to teaching and learning. Nevertheless, the extent to which these principles are reflected in everyday classroom practice remains unclear. Limited research has explored how Albanian EFL teachers perceive movement-based instruction or how local conditions influence implementation. Examining teacher perspectives, therefore, provides an opportunity to better understand how international educational ideas are interpreted within a specific national context.

Theoretical Framework: Embodied Cognition

According to embodied perspectives, cognitive processes are closely linked to sensory, motor, and perceptual systems. Understanding language is therefore not purely abstract; it often involves mentally simulating actions, experiences, and situations described through words.

Glenberg (2011) argues that comprehension is strengthened when learners actively connect language with physical experience. From this perspective, movement is not simply an aid to motivation but a potential contributor to meaning-making itself. Activities such as role-play, gesture use, and story dramatization may support understanding by helping learners create richer mental representations of language.

Related work by Kiefer and Trumpp (2012) emphasizes that cognition develops through interactions between perception, action, and environment. More recent theoretical work has expanded embodied perspectives by demonstrating how sensorimotor processes contribute to language understanding across multiple levels of linguistic processing, from individual words to broader discourse structures (Körner et al., 2023).

Embodied cognition does not imply that movement is necessary for all learning. Rather, it provides a theoretical explanation for why physically engaging with language may enhance understanding in some contexts. This perspective offers a useful framework for interpreting teachers' views regarding movement-based reading activities and their potential role in supporting learner engagement and comprehension.

METHODOLOGY

Research Design

This study employed a quantitative descriptive survey design to investigate primary school EFL teachers' perceptions of movement-based activities during reading instruction. A survey approach was selected because the study sought to document teachers' reported practices, experiences, and views regarding movement-integrated learning rather than examine causal relationships between instructional strategies and student outcomes.

The research focused on three areas: (a) teachers' use of movement-based activities during reading lessons, (b) perceptions of the effects of movement on student attention and engagement, and (c) challenges associated with implementing movement-integrated instruction in primary school classrooms.

Participants and Sampling

The study was conducted in public primary schools located in Tirana, Albania. A stratified school-based sampling procedure was used to ensure representation across schools serving different socioeconomic communities. Twelve public primary schools were selected from high-, medium-, and low-socioeconomic areas of Tirana, and all English as a Foreign Language (EFL) teachers within the selected schools were invited to participate.

A total of 148 teachers participated from an invited sample of 189, resulting in a response rate of 78.3%. Participants represented a broad range of professional experience. Teaching experience ranged from 1 to 30 years (M = 12.4 years, SD = 7.8). Respondents taught across Grades 1–5 and worked in schools located in high-, medium-, and low-socioeconomic areas. This diversity allowed the study to capture perspectives from teachers working in a variety of primary school settings. Table 1 presents the demographic characteristics of the sample.

Table 1: Demographic Characteristics of Participating Teachers

Characteristic	Category	N	%
Teaching Experience	1–5 years	38	25.7
	6–15 years	72	48.6
	16+ years	38	25.7
Grade Level Taught	Grades 1–2	52	35.1
	Grades 3–4	64	43.2
	Grade 5	32	21.6
School Socioeconomic Area	High SES	50	33.8
	Medium SES	68	45.9
	Low SES	30	20.3

Instrument Development

Data were collected through a structured questionnaire consisting of 13 multiple-choice items. The instrument was designed specifically for this study and focused on four broad areas:

- use of movement-based instructional practices,
- perceived effects on attention and engagement,
- perceived reading-related benefits,
- implementation challenges.

Question development was informed by previous research on physically active learning, embodied cognition, and movement-integrated instruction. Particular attention was given to ensuring that the items reflected situations

commonly encountered in primary EFL classrooms.

Before the main data collection phase, the questionnaire was piloted with 15 EFL teachers who were not included in the final sample. Participants were asked to comment on item clarity, wording, and relevance. Feedback from the pilot resulted in minor revisions to improve readability and reduce ambiguity.

The questionnaire was also reviewed by two specialists in EFL education and educational research. Their evaluation focused on item clarity, content relevance, alignment with the study objectives, and suitability for the target population.

The instrument was designed primarily to obtain descriptive information regarding teachers' classroom practices and perceptions rather than to measure latent psychological constructs. Consequently, emphasis was placed on establishing content validity through expert review and pilot testing. Because the questionnaire was not intended as a psychometric scale and no composite measures were created, procedures such as factor analysis and internal consistency estimation (e.g., Cronbach's alpha) were not considered appropriate.

Table 2: Alignment of Questionnaire Constructs, Items, and Planned Analyses

Primary Construct	Description & Research Focus	Question Numbers	Analysis Method
Implementation Practices	Captures the *frequency, type, timing, and target students* for movement activities.	1, 2, 4, 9, 13	Descriptive statistics (frequencies, %);
Perceived Efficacy	Assess teacher *perceptions* of the impact on student attention, behavior, and specific reading/comprehension skills.	5, 7, 8, 10, 11, 12	Descriptive statistics (frequencies, %);
Observational Demographics	Explores teacher-observed differences in response based on *student characteristics* (age, gender).	3, 4	Descriptive statistics (frequencies, %).
Implementation Challenges	Identifies *barriers and practical difficulties* faced by teachers	6	Descriptive statistics (frequencies, %).

Data Collection Procedures

Data collection was conducted over a four-week period using Google Forms. School administrators were contacted prior to the distribution of the questionnaire, and participating teachers received information about the purpose of the study and the voluntary nature of participation.

Respondents completed the survey independently and anonymously. No identifying information was collected, and teachers were able to discontinue participation at any stage without consequence. The online format was selected because it allowed participants to complete the questionnaire at a convenient time while facilitating efficient data management and analysis.

Data Analysis

Survey responses were analyzed using IBM SPSS Statistics Version 28. Given the descriptive nature of the study, the analysis focused on frequencies and percentages.

The objective of the analysis was to identify patterns in teachers' responses rather than test hypotheses or establish statistical relationships among variables. Findings are therefore presented as descriptive summaries of participants' reported practices and perceptions. Although descriptive statistics do not permit causal inference, they provide a useful overview of how movement-based instruction is perceived and implemented within the participating schools.

Ethical Considerations

Ethical approval for the study was obtained from the Research Ethics Committee of the University of Tirana. Participants received information regarding the aims of the research, procedures for participation, and their rights as research participants. Informed consent was obtained electronically before respondents accessed the questionnaire.

All responses were collected anonymously and stored securely. Data were used exclusively for research purposes and were analyzed in aggregate form to protect participant confidentiality.

Several measures were taken to support response quality, including anonymous participation, clear survey instructions, and balanced response options. While self-report surveys remain subject to limitations such as social desirability bias, anonymity was emphasized throughout the study to encourage honest responses and reduce evaluation concerns. Nevertheless, the possibility that participants overreported the frequency or effectiveness of movement-based practices cannot be entirely excluded and should be considered when interpreting the findings.

RESULTS

Use of Movement-Based Activities During Reading Instruction

Participants reported using a range of movement-based activities during reading lessons. Role-play and story enactment were the most frequently reported strategies (47.3%), followed by interactive games and learning stations (30.4%). Stretching and short movement breaks were reported by 17.6% of participants, while only 4.7% indicated that they did not use movement-based activities.

Table 3: Types of Movement-Based Activities Used During Reading Instruction

Activity Type	n	%
Role-play and story enactment	70	47.3
Interactive games and learning stations	45	30.4
Stretching and movement breaks	26	17.6
Do not use movement activities	7	4.7

Teachers also reported differences in when movement activities were used during instruction. Just over half of participants (50.7%) indicated that movement was most effective before reading tasks, while 38.5% preferred

integrating movement during reading activities. Only 10.8% reported that movement was most useful after reading. Regarding target groups, 45.9% of teachers reported using movement-based activities with all students, whereas 26.4% primarily used them with learners experiencing attention difficulties and 23.0% reported using them mainly with younger learners.

Teachers were also asked whether they observed differences in how students responded to movement-based reading activities according to age and gender. Responses regarding age were relatively balanced, with 39.2% indicating that younger primary students (ages 6–8) benefited most, 38 % reporting stronger benefits for older primary students (ages 9–12), and 22.3% believing that both age groups benefited equally. With respect to gender, nearly half of the respondents (47.3%) reported that boys and girls responded similarly to movement-based activities. However, 33.8% perceived greater benefits among boys, while 12.2% believed girls benefited more. Only 6.7% reported no noticeable differences in student responses. These findings suggest that teachers generally perceive movement-based learning as beneficial across different student groups, although some variation in responsiveness may be observed according to age and gender.

Table 4: Timing and Target Groups for Movement-Based Activities During Reading Instruction

Category	Variable	Response output	n	%
Targets and Timing	**Timing of Movement Activities**	Before reading	75	50.7
		During reading	57	38.5
		After reading	16	10.8
	Target Student Group	All students	68	45.9
		Students with attention difficulties	39	26.4
		Younger learners only	34	23
		Not used	7	4.7
Observed Student Differences	**Age Group Perceived to Benefit Most**	Younger students (6–8)	58	39.2
		Older students (9–12)	57	38
		Both age groups equally	33	22.8
	Gender Differences in Response to	Boys and girls benefit similarly	70	47.3
		Boys benefit more	50	33.8

	Movement	Girls benefit more	18	12.2
		No noticeable difference	10	6.7

Perceived Effects on Attention, Engagement, and Reading

Table 5 summarizes teachers' perceptions of the effects of movement on attention and classroom behavior. Nearly half of the respondents (48.6%) reported that movement-based activities significantly improved students' ability to maintain focus during reading lessons, while an additional 38.5% observed benefits for at least some learners. Similar patterns emerged regarding classroom engagement, with 50.7% of teachers reporting increased student focus and engagement and 28.4% reporting higher levels of participation. Very few respondents associated movement with negative classroom outcomes. Overall, these findings indicate that movement is generally perceived as a positive contributor to classroom engagement and attentional readiness**.**

Table 5: Effects of Movement-Based Activities on Attention and Engagement

Category	**Variable**	**Response output**	**n**	**%**
Effects of Movement on Attention and Classroom Engagement	**Impact on attention**	Significantly improves focus	72	48.6
		Helps some students maintain focus	57	38.5
		No major impact	11	7.4
		Distracts students	8	5.4
	Behavioral changes	Students become more engaged and focused	75	50.7
		Increased participation in classroom activities	42	28.4
		Some distraction, but most students remain on task	23	15.5
		Creates distraction	8	5.4

As shown in Table 6, teachers reported that students responded most positively to role-play and story enactment activities (52.7%). Hand gestures and movement-supported discussion were also viewed positively, although less frequently. Teachers additionally indicated that combining multiple forms of movement was the most effective instructional approach (43.9%), suggesting that varied movement experiences may better support engagement than relying on a single movement strategy.

Table 6: Student Responsiveness and Preferred Types of Movement Activities

Category	**Variable**	**Response output**	**n**	**%**
Student	**Student responsiveness**	Acting out stories and role-play	78	52.7
		Hand gestures and	40	27

Responsiveness and Preferred Movement		discussion		
		Physical games and stations	30	20.3
	Preferred movement type	Combination of movement forms	65	43.9
		Whole-body movement	44	29.7
		Gestures	22	14.9
		Fine-motor activities	17	11.5

Table 7 presents teachers' perceptions regarding the reading-related outcomes associated with movement-based instruction. Reading comprehension was the skill most frequently identified as benefiting from movement activities (55.4%), substantially exceeding fluency, word recognition, and confidence in reading aloud. Teachers also associated movement with specific comprehension processes, particularly identifying main ideas (35.8%) and understanding cause-and-effect relationships (20.9%). These findings suggest that teachers perceive movement not only as a tool for increasing participation but also as a means of supporting higher-level comprehension processes during reading instruction.

Table 7: Perceived Impact of Movement-Based Activities on Reading Skills and Comprehension Processes

Category	**Variable**	**Response Options**	**n**	**%**
Reading Outcomes Associated with Movement-Based Activities	Suggested pre-reading activity	Acting out vocabulary	62	41.9
		Movement-based games	44	29.7
		Stretching and breathing	42	28.4
	Reading skills improved	Reading comprehension	82	55.4
		Confidence in reading aloud	26	17.6
		Fluency	21	14.2
		Word recognition	19	12.8
	Comprehension aspects improved	Identifying main ideas	53	35.8
		Understanding cause–and–effect relationships	31	20.9
		Retelling stories	26	17.6
		Drawing conclusions	24	16.2
		Making predictions	14	9.5

Challenges and Implementation Considerations

Despite generally positive perceptions, teachers identified several practical challenges associated with movement-integrated instruction. Student overexcitement emerged as the most frequently reported concern (35.8%), followed by limited classroom space (16.9%). A smaller proportion of teachers reported difficulties integrating movement into lesson planning (7.4%). Nevertheless, the largest response category was "no significant challenges" (39.9%), indicating that many teachers considered movement-based activities manageable within their existing instructional practices.

Table 8: Teachers' Perceived Challenges in the Implementation of Movement-Based Activities During Instruction

Category		Variable	Response output	n	%
Challenges in Implementing Movement		**Challenge**	No significant challenges	59	39.9
			Student overexcitement	53	35.8
			Limited classroom space	25	16.9
			Difficulty integrating movement into lesson planning	11	7.4

Overall, the results indicate that movement-based activities are widely used by participating teachers and are generally perceived as supporting attention, engagement, and reading-related learning. At the same time, implementation appears to be influenced by practical classroom considerations, particularly space constraints and classroom management demands.

DISCUSSION

The purpose of this study was to examine how primary school EFL teachers in Tirana perceive the use of movement-based activities during reading instruction. Overall, the findings indicate that teachers generally regard movement as a useful classroom tool for supporting attention, participation, and engagement. Rather than viewing physical activity as separate from learning, many participants described movement as an instructional resource that can help learners interact more actively with reading tasks.

One of the most notable findings concerns the types of activities Albanian EFL teachers considered most effective. Role-play, story dramatization, and vocabulary enactment were consistently identified as strategies that encouraged student participation. This preference suggests that teachers value movement most when it is directly connected to lesson content. Activities that require students to act out events, represent vocabulary physically, or participate in story-based tasks appear to be viewed as more educationally meaningful than movement used solely to increase energy levels or provide a break from classroom routines.

This finding is consistent with research emphasizing the importance of integrating movement into academic content rather than treating physical activity as an independent classroom intervention. Studies of physically active learning have shown that educational benefits are often strongest when movement contributes directly to the learning task

itself. The responses obtained in the present study suggest that teachers recognize this distinction and tend to favor activities that combine physical participation with language use.

Another important finding relates to the timing of movement activities. Many teachers reported that movement was most effective before reading tasks rather than during or after reading. This preference may reflect practical classroom considerations. Short activities implemented before reading can help students settle into the lesson, focus their attention, and prepare for academic work without disrupting the flow of instruction. In contrast, movement during reading may require greater planning, classroom management, and flexibility.

The preference for pre-reading movement may also reveal an underlying pedagogical assumption regarding the role of physical activity in language learning. Many teachers appear to view movement primarily as a preparatory strategy that enhances concentration before academic work begins rather than as an integral component of reading instruction itself. This distinction is important because contemporary models of physically active learning emphasize the educational value of movement that is embedded within learning tasks rather than separated from them.

The findings further suggest that teachers associate movement with specific aspects of reading development, particularly comprehension and the identification of main ideas. While these perceptions cannot be interpreted as evidence of actual learning gains, they are nevertheless noteworthy. Teachers observe students on a daily basis and make instructional decisions based on their classroom experiences. Their perceptions, therefore, provide insight into which learning processes they believe are most responsive to movement-based activities.

One possible explanation for these perceptions can be found in embodied cognition theory. The findings are particularly relevant to reading instruction because embodied cognition proposes that comprehension is strengthened when learners connect language with sensory and motor experiences, allowing textual meaning to be grounded in physical action. From an embodied perspective, understanding language involves more than processing words and sentences; it also involves connecting meaning to actions, experiences, and sensory representations. Activities such as role-play and dramatization may help students build these connections by linking language to physical experience.

The study also highlights the influence of contextual factors on instructional decision-making. Although participants generally expressed positive attitudes toward movement-based instruction, they also identified practical obstacles. Concerns related to student overexcitement, limited classroom space, and classroom management were reported frequently. These challenges illustrate that the implementation of movement-based learning is shaped not only by pedagogical beliefs but also by material and organizational conditions.

Such findings are particularly relevant in the Albanian educational context. Many schools operate within physical and structural constraints that may limit opportunities for active learning. As a result, teachers often need to balance the perceived benefits of movement with the realities of classroom organization, available space, and curricular expectations. The coexistence of positive attitudes and practical concerns suggests that successful implementation depends as much on classroom conditions as on teachers' willingness to adopt innovative approaches. The results

should also be interpreted with appropriate caution. Because the study relies entirely on self-reported teacher perceptions, it cannot determine whether movement-based activities improve reading comprehension, attention, or academic achievement. Teachers may overestimate or underestimate the effectiveness of particular strategies, and their views may be influenced by personal teaching philosophies or prior experiences. Consequently, the findings should be understood as evidence of teacher perceptions rather than evidence of instructional effectiveness.

Despite these limitations, the study contributes to the growing literature on movement-integrated learning by drawing attention to the perspectives of practitioners. Much of the existing research focuses on learner outcomes, intervention effects, or theoretical explanations. Less attention has been given to how Albanian EFL teachers interpret movement-based instruction within the realities of everyday classroom practice. By focusing on teacher perspectives, the present study offers insight into the conditions that may support or hinder the implementation of physically active learning in primary EFL classrooms in Tirana Albania.

Overall, the findings suggest that movement-based reading activities are viewed positively by many Albanian EFL teachers, particularly when those activities are closely connected to instructional goals. At the same time, the results emphasize that the effectiveness and sustainability of such practices are influenced by classroom context, available resources, and teachers' ability to integrate movement into existing instructional routines.

CONCLUSION

This study explored how primary school EFL teachers in Tirana perceive the use of movement-based activities during reading instruction. The findings indicate that teachers generally view movement as a valuable classroom practice for supporting student attention, participation, and engagement. Activities that linked movement directly to learning objectives, such as role-play, story dramatization, and vocabulary enactment, were perceived as particularly effective.

The findings also highlight the practical considerations shaping teachers' decisions. Participants recognized the educational benefits of movement but also noted challenges related to classroom space, management, and lesson organization. Consequently, teachers tended to favor activities that could be integrated without disrupting instructional routines.

Although the study does not provide evidence that movement directly improves reading achievement, it offers insight into how teachers understand the relationship between physical activity and learning. These perspectives are important because they influence the adoption and sustainability of movement-based practices.

This study contributes to the growing literature on movement-integrated learning by providing evidence from an underrepresented educational context and by highlighting teachers' perspectives on instructional innovation. The findings suggest that movement-based reading activities are perceived as most beneficial when closely aligned with instructional goals, while practical constraints remain an important consideration for implementation. These insights may inform future research, teacher education, and the development of more effective movement-integrated EFL reading practices.

PEDAGOGICAL IMPLICATIONS

Several practical implications emerge from the findings.

First, movement activities appear to be most effective when they are integrated into instructional content rather than used as isolated classroom exercises. Teachers consistently reported positive experiences with activities that required students to interact physically with stories, vocabulary, or reading tasks. This suggests that movement should be designed as part of the learning process rather than as a separate addition to it.

Second, the findings highlight the importance of flexibility. Not all classrooms offer the same physical conditions, and teachers often need to adapt activities to available space, class size, and student needs. Small-scale movement tasks, gestures, pair work, and role-play activities may provide practical alternatives in settings where large-group movement is difficult to organize.

Third, teacher preparation may play an important role in successful implementation. Professional development opportunities focused on movement-integrated learning could help teachers expand their repertoire of classroom strategies and address concerns related to organization and classroom management.

Finally, the findings suggest that movement can be incorporated into reading instruction without requiring major curricular changes. Even brief activities linked to vocabulary development, prediction tasks, sequencing exercises, or story comprehension may increase opportunities for active student participation.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Several limitations should be considered when interpreting the findings.

The study was conducted exclusively in public primary schools in Tirana. Although the sample included teachers from different socioeconomic areas, the findings may not reflect experiences in rural schools, private institutions, or other regions of Albania. Future studies should examine whether similar patterns emerge across different educational contexts.

A second limitation concerns the reliance on self-reported data. The study examined teachers' perceptions rather than actual classroom behavior. As with all survey research, responses may have been influenced by personal beliefs, memory, or social desirability. Classroom observations and qualitative interviews would provide a more detailed understanding of how movement-based activities are implemented in practice.

The study also did not include direct measures of student outcomes. Consequently, it cannot determine whether movement-based instruction improves reading comprehension, attention, motivation, or academic achievement. Future research should combine teacher perspectives with student performance data in order to examine these relationships more directly.

In addition, the descriptive design limits the conclusions that can be drawn. While the study identifies patterns in teacher responses, it does not explain why certain perceptions exist or how they vary across different groups of teachers. Further research could explore whether factors such as teaching experience, grade level, professional training, or school context influence attitudes toward movement-integrated instruction.

Nevertheless, because the findings are based on self-reported perceptions rather than direct measures of student performance, conclusions regarding instructional effectiveness should be interpreted cautiously.

Future investigations would benefit from mixed-methods and longitudinal approaches that examine both implementation and outcomes over time. Research comparing different forms of movement-based instruction, including role-play, gesture-supported learning, and structured physical activity, may also provide a clearer understanding of which approaches are most effective for supporting reading development in EFL classrooms.

REFERENCES

Álvarez-Bueno, C., Pesce, C., Cavero-Redondo, I., Sánchez-López, M., Martínez-Hortelano, J. A., & Martínez-Vizcaíno, V. (2017). The effect of physical activity interventions on children's cognition and metacognition: A systematic review and meta-analysis. Journal of the American Medical Association Pediatrics, 171(11), 1064–1075. https://doi.org/10.1001/jamapediatrics.2017.2400

Asher, J. J. (1969). The total physical response approach to second language learning. The Modern Language Journal, 53(1), 3–17.

Bailey, R., O'Brien, W., & Nilson, C. (2023). Physically active learning: A European perspective. Sustainability, 15(4), 3413. https://doi.org/10.3390/su15043413

Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P. D., Lambourne, K., & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: A systematic review. Medicine & Science in Sports & Exercise, 48(6), 1197–1222. https://doi.org/10.1249/MSS.0000000000000901

Duncan, M. J., Eyre, E., Oxford, S. W., & Bryant, E. (2021). The impact of classroom-based physical activity interventions on academic achievement, cognition, and physical activity outcomes for primary school children: A systematic review. International Journal of Environmental Research and Public Health, 18(21), 11163. https://doi.org/10.3390/ijerph182111163

Glenberg, A. M. (2011). How reading comprehension is embodied and why that matters. International Electronic Journal of Elementary Education, 4(1), 5–18.

Haapala, E. A., Vaisto, J., Lintu, N., Westgate, K., Ekelund, U., Poikkeus, A. M., Brage, S., & Lakka, T. A. (2017). Physical activity and sedentary time in relation to academic achievement in children. Journal of Science and Medicine in Sport, 20(6), 583–589. https://doi.org/10.1016/j.jsams.2016.11.003

Hillman, C. H., Pontifex, M. B., Raine, L. B., Castelli, D. M., Hall, E. E., & Kramer, A. F. (2009). The effect of acute treadmill walking on cognitive control and academic achievement in preadolescent children. Neuroscience, 159(3), 1044–1054. https://doi.org/10.1016/j.neuroscience.2009.01.057

Kiefer, M., & Trumpp, N. M. (2012). Embodiment theory and education: The foundations of cognition in perception and action. Trends in Neuroscience and Education, 1(1), 15–20.

Körner, A., Castillo, M., Drijvers, L., Fischer, M. H., Günther, F., Marelli, M., Platonova, O., Rinaldi, L., & Shaki, S. (2023). Embodied processing at six linguistic granularity levels: A consensus paper. Journal of Cognition, 6(1), 60.

Mahar, M. T., Murphy, S. K., Rowe, D. A., Golden, J., Shields, A. T., & Raedeke, T. D. (2006). Effects of a classroom-based program on physical activity and on-task behavior. Medicine & Science in Sports & Exercise, 38(12), 2086–2094. https://doi.org/10.1249/01.mss.0000235359.16685.a3

Mavilidi, M. F., Ruiter, M., Schmidt, M., Okely, A. D., Loyens, S., Chandler, P., & Paas, F. (2018). A narrative review of school-based physical activity for enhancing cognition and learning: The importance of relevancy and integration. Frontiers in Psychology, 9, 2079. https://doi.org/10.3389/fpsyg.2018.02079

Mullender-Wijnsma, M. J., Hartman, E., de Greeff, J. W., Doolaard, S., Bosker, R. J., & Visscher, C. (2016). Physically active math and language lessons improve academic achievement: A cluster randomized controlled trial. Pediatrics, 137(3), e20152743. https://doi.org/10.1542/peds.2015-2743

Norris, E., van Steen, T., Direito, A., & Stamatakis, E. (2020). Physically active lessons in schools and their impact on physical activity, educational, health and cognition outcomes: A systematic review and meta-analysis. British Journal of Sports Medicine, 54(14), 826–838. https://doi.org/10.1136/bjsports-2018-100502

Shoval, E. (2011). Using mindful movement in cooperative learning while learning about angles. Instructional Science, 39(4), 453–466. https://doi.org/10.1007/s11251-010-9137-2

Syväoja, H., Tammelin, T., Ahonen, T., Kankaanpää, A., & Kantomaa, M. (2022). Physical activity and academic achievement in children and adolescents: A systematic review and meta-analysis. Frontiers in Education, 7, 925925. https://doi.org/10.3389/feduc.2022.925925

Watson, A., Timperio, A., Brown, H., Best, K., & Hesketh, K. D. (2019). Effect of classroom-based physical activity interventions on academic and physical activity outcomes: A systematic review and meta-analysis. International Journal of Behavioral Nutrition and Physical Activity, 16(1), 1–24. https://doi.org/10.1186/s12966-019-0875-5

Mihai Eminescu's Nature Poetry: An Ecocritical Perspective

Marinică Tiberiu Şchiopu[3]

Abstract

This paper examines the nature poetry of Mihai Eminescu through the theoretical lens of ecocriticism, highlighting the poet's nuanced representation of the relationship between human subjectivity and the natural world. While Eminescu is often situated within the Romantic tradition, this study argues that his poetry anticipates key ecocritical concerns by attributing agency, voice, and emotional depth to nonhuman entities. Focusing on selected poems in which forests, lakes, and celestial elements are personified, the analysis demonstrates how nature is not merely a symbolic backdrop but an active participant in existential and temporal reflection. The paper further explores how Eminescu's depiction of seasonal cycles, ecological interdependence, and environmental transience challenges anthropocentric perspectives and reveals an underlying awareness of ecological fragility. By foregrounding motifs such as decay, migration, and the passage of time, his work articulates a vision of nature marked by both beauty and vulnerability. Ultimately, this ecocritical approach repositions Eminescu as a poet whose engagement with nature transcends Romantic idealisation, offering instead a complex and prescient meditation on the interconnectedness of all forms of life and the ethical implications of humanity's place within the natural environment. Some of the research questions of this study are the following: "How do humans and other-than-humans interact in these poems?", "What emotional ties are there between the poetic self and nature?" or "Which are the distinctive features of Mihai Eminescu's poetry of nature?". In this approach, ecocriticism, geocriticism and close reading will be indispensable.

Keywords: ecocriticism, Eminescu, environment, poetry, Romanticism.

1. Introduction

Few European poets have been as profoundly associated with the natural world as Mihai Eminescu. Throughout his poetic oeuvre, forests, rivers, lakes, stars, mountains, flowers, birds, and celestial landscapes become active participants in philosophical reflection rather than decorative settings. Nature is never passive scenery; instead, it

[3] PhDRomanian Language Institute, Romania University of Delhi, India marinica.schiopu@gmail.com, Marinică Tiberiu Şchiopu (0000-0003-1194-9177) - ORCID

functions as a living presence through which questions concerning existence, temporality, love, death, memory, and cosmic order are explored. Traditional Eminescu scholarship has predominantly interpreted these landscapes through Romantic symbolism, philosophical idealism, folklore, mythology, or national identity (Călinescu, 1988; Dumitrescu-Bușulenga, 1989). Such approaches have produced invaluable insights into the poet's intellectual formation and artistic achievement. Nevertheless, contemporary environmental humanities invite new perspectives capable of revealing previously overlooked dimensions of canonical literature.

Ecocriticism, which emerged as an established field during the final decades of the twentieth century, investigates the relationship between literature and the physical environment (Glotfelty & Fromm, 1996). Rather than treating nature merely as metaphor, ecocritical scholarship examines how literary texts imagine ecological relationships, represent nonhuman agency, critique anthropocentrism, and articulate environmental ethics. Although ecocriticism has developed extensive analyses of British Romanticism, American transcendentalism, and contemporary environmental literature, Eastern European literary traditions remain comparatively underrepresented. Romanian literature, despite its rich engagement with forests, rivers, mountains, and rural life, has only recently begun to attract ecocritical attention. Eminescu therefore offers a particularly productive case study for expanding ecocritical discourse beyond its predominantly Anglo-American corpus.

This article argues that Eminescu's nature poetry anticipates several ecological ideas that resonate strongly with contemporary environmental thought. Rather than positioning humanity above nature, Eminescu repeatedly portrays humans as temporary participants within vast ecological and cosmic systems. His forests possess memory; lakes preserve emotional experience; celestial bodies embody temporal continuity; seasonal cycles reveal forms of ecological permanence exceeding individual existence.

These poetic representations challenge modern assumptions regarding human exceptionalism. Although Eminescu wrote decades before ecological science developed its contemporary vocabulary, his poetic imagination consistently emphasizes interconnectedness, cyclical temporality, and the intrinsic value of nonhuman existence.

Using ecocritical theory as its principal analytical framework, the article examines selected poems that best illustrate these ecological dimensions. The discussion combines close textual analysis with contemporary environmental philosophy in order to demonstrate the continuing relevance of Eminescu's poetry for twenty-first-century environmental humanities.

2. Literature Review

Critical interpretations of Mihai Eminescu have evolved considerably since the late nineteenth century. Early scholarship emphasized his role as Romania's national poet, while twentieth-century critics increasingly explored his philosophical influences, Romantic aesthetics, mythological imagination, and linguistic innovation.

The most influential comprehensive study remains George Călinescu's *Viața lui Mihai Eminescu*, first

published in 1932 and substantially revised in later editions. Călinescu presents Eminescu as a poet whose imagery derives from an exceptional synthesis of folklore, German philosophy, classical culture, and Romantic aesthetics. Although nature occupies a central place in his interpretation, it primarily functions as an extension of metaphysical and psychological experience rather than an ecological reality.

Similarly, Zoe Dumitrescu-Bușulenga situates Eminescu within the broader European Romantic tradition while emphasising the philosophical foundations of his poetic vision. Her analyses highlight the influence of Arthur Schopenhauer, Immanuel Kant, Indian philosophy, and German Idealism upon Eminescu's representation of the universe. Nature appears as an expression of cosmic harmony and metaphysical unity rather than as an ecological system possessing intrinsic agency.

Dumitru Irimia's linguistic and stylistic studies contribute another essential perspective by demonstrating how Eminescu's poetic language constructs dynamic relationships between human consciousness and the natural environment. Irimia emphasizes the semantic richness through which forests, waters, celestial bodies, and vegetal imagery generate complex symbolic structures. While his work does not explicitly adopt ecocritical methodology, it establishes important foundations for ecological interpretation by foregrounding the active role of natural imagery within Eminescu's poetic discourse.

International ecocritical scholarship emerged during the 1990s with the publication of *The Ecocriticism Reader* (Glotfelty & Fromm, 1996), which defined ecocriticism as the study of relationships between literature and the physical environment. Since then, the field has expanded substantially. Lawrence Buell (1995) argues that environmentally oriented literature recognizes the nonhuman environment as an active presence rather than a passive setting. His concept of environmental imagination encourages scholars to examine how literary texts attribute ethical significance to ecological systems. Greg Garrard (2023) further develops ecocriticism through thematic categories such as wilderness, pastoral, apocalypse, dwelling, animals, and pollution. His work demonstrates that environmental criticism extends beyond descriptions of landscape to encompass ideological assumptions governing humanity's relationship with nature. Timothy Morton (2007) critiques conventional understandings of "nature" itself, arguing that ecological thinking requires abandoning simplistic separations between humanity and the environment. Instead, all living beings participate within interconnected ecological networks characterized by complexity and mutual dependence. Kate Rigby (2015) expands ecocritical inquiry by emphasizing literature's capacity to cultivate ecological imagination and environmental ethics. Literary texts, she argues, enable readers to perceive relationships between human culture and nonhuman processes that scientific discourse alone cannot fully articulate.

Despite the international expansion of environmental humanities, ecocritical studies devoted specifically to Romanian literature remain relatively limited. Existing scholarship has concentrated primarily on folklore, pastoral traditions, rural identity, and cultural geography rather than ecological philosophy. Consequently, Eminescu's poetry offers an important opportunity to demonstrate how nineteenth-century Romanian literature meaningfully

contributes to contemporary environmental thought.

This study therefore seeks to bridge Romanian literary criticism and international ecocritical scholarship. Rather than replacing traditional interpretations of Eminescu, the ecocritical approach complements them by revealing additional dimensions of his poetic engagement with forests, lakes, celestial landscapes, and seasonal cycles. Such a perspective illustrates how canonical literature continues to generate new meanings in response to evolving theoretical paradigms and contemporary environmental concerns.

3. Methodology

This study employs qualitative textual analysis informed by ecocritical literary criticism. Rather than reconstructing the historical circumstances surrounding Eminescu's compositions, the article focuses upon the ecological meanings generated by the poems themselves while situating those meanings within contemporary environmental humanities.

The corpus consists of six poems representing different stages and dimensions of Eminescu's engagement with nature: *Fiind băiet păduri cutreieram*, *Revedere*, *O, rămâi*, *Lacul*, *Mai am un singur dor*, and *Luceafărul*. These texts were selected because they consistently foreground interactions between human consciousness and natural environments while illustrating recurrent ecological motifs such as forests, lakes, celestial bodies, seasonal cycles, and cosmological temporality.

Close reading constitutes the principal analytical method. Attention is given to imagery, symbolism, spatial organization, temporal structures, personification, and representations of nonhuman agency. Rather than interpreting natural elements exclusively as metaphors for human emotions, the analysis examines the extent to which they retain autonomous significance within the poetic universe.

This approach combines Romanian literary criticism with contemporary ecocritical theory. Traditional scholarship provides historical and cultural context, while environmental humanities offer conceptual tools for understanding ecological relationships that earlier criticism often left unexplored.

4. An ecocritical overview of Mihai Eminescu’s nature poetry

4.1 Forests as Ecological Memory: *Fiind băiet păduri cutreieram* (*Being a lad I used to roam into the woods*)

Among Eminescu's poems, *Fiind băiet păduri cutreieram* presents one of the most intimate representations of ecological belonging. The forest is neither picturesque scenery nor symbolic ornament; it constitutes the primary environment through which childhood consciousness develops. Human identity emerges through prolonged participation in natural processes rather than through separation from them.

The poem's recollection of wandering through forests constructs childhood as an ecological rather than merely autobiographical experience. The speaker remembers streams, leaves, birds, shadows, and sunlight not as isolated visual impressions but as interconnected elements within a living environment. Such imagery corresponds closely to Buell's (1995) understanding of environmental imagination, whereby landscapes actively shape human perception and identity.

Significantly, the forest functions as a community composed of multiple living agents. Birds communicate through song, trees generate shelter and continuity, while flowing water marks the passage of time without privileging human chronology. The lyrical subject participates within this ecological network rather than dominating it. This decentered perspective challenges anthropocentric assumptions that position humanity above the natural world. From an ecocritical perspective, memory itself becomes ecological. The remembered landscape does not merely preserve personal experience; rather, personal identity is inseparable from the material environment in which it originated. Contemporary environmental philosophers increasingly recognize memory as spatially embedded, arguing that landscapes function as repositories of cultural and individual identity (Rigby, 2015). Eminescu anticipates this insight by presenting recollection as impossible without the continued presence of forests and waterways.

The forest also resists linear historical time. Human childhood inevitably disappears, yet the forest remains characterized by cyclical regeneration. Leaves fall and return; seasons change without finality; birds migrate yet repeatedly reappear. Such temporal continuity contrasts with the brevity of individual human life. Rather than lamenting this disparity, the poem invites acceptance of humanity's participation within larger ecological cycles.

Consequently, the forest emerges as an ethical model. It embodies resilience, coexistence, diversity, and continuity—qualities increasingly emphasized within contemporary ecological discourse concerning sustainability and environmental responsibility. Although Eminescu could not have anticipated twenty-first-century environmental terminology, his poetic imagination repeatedly privileges ecological balance over human mastery.

4.2 Dialogue Between Human Time and Ecological Time: *Revedere* (*Return*)

If *Fiind băiet păduri cutreieram* establishes emotional intimacy between humans and forests, *Revedere* develops a more explicitly philosophical meditation on ecological temporality. The poem is structured as a dialogue between the lyrical speaker and the forest, yet this conversation gradually reveals profound differences between human existence and the temporal rhythms governing the natural world.

The forest speaks with remarkable authority. Rather than functioning as a projection of human consciousness, it possesses an independent voice grounded in continuity and renewal. This literary strategy exemplifies what ecocritics describe as nonhuman agency—the recognition that natural entities possess forms of existence irreducible to human interpretation. Human life appears transient, marked by aging, uncertainty, and historical change. By contrast, the forest remains integrated within cyclical ecological processes. Seasonal

transformations recur without undermining the continuity of the ecosystem itself. Spring follows winter; vegetation regenerates; birds return according to rhythms extending far beyond individual biography. This contrast resonates strongly with Morton's (2007) critique of anthropocentric temporal scales. Modern societies often privilege human history while overlooking the slower rhythms through which ecological systems operate. Eminescu instead reverses this hierarchy. Human concerns become momentary interruptions within the forest's enduring existence.

Importantly, the forest does not reject humanity. Instead, it reminds the speaker that human life acquires meaning only when understood as one element within broader ecological continuity. Such a perspective parallels contemporary theories of environmental ethics emphasizing humility, reciprocity, and interdependence rather than domination:

"What **of** seasons, **when** for **ages**
All **the** sky my lake engages;
What of **years** ill or good,
When the sap mounts in the wood;
What **of years** good or ill,
When the Danube rolls **on** still.
Only man is always changing,
O'er the world **forever** ranging;
We each do our **place** retain,
As **we** were, so we remain;
Oceans, rivers, **mountains** high
And the stars that light **the sky,**
Saturn with its whirling rings,
And the forest with its springs" (Eminescu, 1989: 114)

The dialogue also challenges Cartesian distinctions separating culture from nature. Communication between human and forest suggests permeability rather than opposition. Language becomes an imaginative bridge enabling recognition of ecological kinship. Although personification serves an important poetic function, the poem ultimately encourages readers to acknowledge the intrinsic vitality of forests beyond their symbolic value. From the perspective of sustainability, *Revedere* proposes an ethics grounded in continuity rather than exploitation. The forest survives because it participates in regenerative cycles; human civilization remains sustainable only insofar as it recognizes those same ecological limits. Eminescu therefore transforms a seemingly nostalgic encounter into a meditation upon humanity's enduring dependence upon living ecosystems.

4.3 Nature as Ethical Presence in *O, rămâi* (*O remain, dear one*)

Among Eminescu's lyric poems, *O, rămâi* presents one of the most profound meditations on the relationship between humanity and the living world. Rather than depicting the forest as a picturesque landscape or

symbolic extension of human feeling, the poem constructs nature as an interlocutor capable of ethical invitation. The repeated appeal to remain within the forest does not merely express nostalgia; it proposes an alternative mode of existence founded upon reciprocity between human consciousness and the more-than-human world.

Ecocritical scholarship increasingly argues that literature may challenge anthropocentric assumptions by attributing agency and communicative capacity to nonhuman entities (Buell, 1995; Rigby, 2015). Eminescu achieves precisely this effect. The forest is not anthropomorphized merely for poetic ornamentation; instead, it becomes a living presence that offers shelter, continuity, and existential orientation. Human identity is invited to develop through attentive participation in ecological processes rather than through domination of them.

The poem also foregrounds what environmental philosophers describe as *dwelling*. Rather than conceiving place as property or resource, dwelling implies an ethical mode of inhabiting the Earth characterized by respect, attentiveness, and belonging. Although developed most explicitly within twentieth-century philosophy, this concept resonates strongly with Eminescu's poetic imagination. The speaker is not encouraged to possess the forest but to coexist within it:

"Stay, for where the lapping wavelets
Shake the tall and tasseled grass,
I will make you hear in secret
How the furtive chamois pass" (Eminescu, 1989: 40).

The opposition between the forest and the human world further reinforces this ecological perspective. Civilization appears associated with instability, ambition, and historical change, whereas the forest embodies continuity and cyclical renewal. This contrast should not be interpreted as a simplistic rejection of culture. Instead, Eminescu suggests that authentic human existence requires sustained contact with ecological rhythms that modern social life often obscures. Seasonality occupies an equally important role. Trees, leaves, birds, and flowing waters participate in recurring cycles of transformation that neither deny mortality nor succumb to final extinction. Human life, by contrast, experiences time primarily as irreversible loss. The poem therefore juxtaposes linear historical time with ecological time, inviting readers to reconsider humanity's place within processes that vastly exceed individual existence.

From an ecocritical standpoint, *O, rămâi* represents an early literary exploration of environmental ethics. The forest is valuable not because it satisfies human needs but because it constitutes an autonomous living community deserving recognition in its own right. Such an understanding closely anticipates ecocentric perspectives developed much later within environmental philosophy.

4.4 Water, Reflection, and Ecological Reciprocity in *Lacul* (*The Forest Pool*)

If forests dominate many of Eminescu's poems, lakes occupy an equally significant position within his ecological imagination. *Lacul* has frequently been interpreted as a Romantic love poem in which landscape mirrors emotional expectation. While this interpretation remains persuasive, an ecocritical reading reveals a more complex relationship between human affect and environmental presence.

The lake is not simply a passive surface reflecting the speaker's emotions. Instead, it possesses its own materiality, movement, and temporal rhythm. The gentle motion of the water, the surrounding vegetation, and the interaction between light and reflection create an environment that exists independently of human desire. The anticipated meeting with the beloved never fully materializes, yet the lake continues its cyclical existence:

"Upon the forest pool's deep blue
Golden petalled lilies float;
Circling silver ripples play
Around an ancient rowing-boat" (Eminescu, 1989: 71).

Lawrence Buell's concept of the environmental imagination provides a productive framework for understanding this dynamic. According to Buell, environmentally significant literature recognizes that landscapes possess histories and agencies extending beyond human narratives. In *Lacul*, emotional experience unfolds within an ecological setting that neither originates from nor depends upon the speaker's subjective consciousness. Water carries particularly rich ecological symbolism. Gaston Bachelard argues that water is associated simultaneously with memory, imagination, transformation, and continuity. Rather than functioning as a static object, it invites contemplative immersion and mediates between interior consciousness and the external world. Eminescu's lake exemplifies this poetic function by creating a liminal space where human expectation encounters ecological permanence. The poem avoids reducing nature to psychological projection. Although the speaker invests the landscape with emotional significance, the lake retains an independent vitality expressed through movement, sound, vegetation, and light. This independence challenges anthropocentric interpretations according to which nature exists solely to symbolize human feeling. The absence of the beloved further strengthens this ecological reading. Human plans remain 55nrealized, yet the natural environment continues unaffected. The poem thus subtly reverses conventional Romantic priorities. Rather than nature deriving meaning from human emotion, human emotion acquires meaning through its temporary participation in an enduring ecological world.

Contemporary environmental humanities frequently emphasize reciprocity rather than mastery as the foundation of sustainable human–environment relationships. *Lacul* illustrates precisely such reciprocity. The speaker does not control the landscape; instead, he learns to inhabit its rhythms of expectation, silence, and renewal. The resulting vision is one of coexistence rather than possession.

4.5 Death, Landscape, and Environmental Continuity: *Mai am un singur dor* (*One wish alone I have*)

Among Eminescu's most philosophically significant poems, *Mai am un singur dor* offers an exceptionally fertile text for ecocritical interpretation because it reimagines death not as separation from nature but as complete reintegration into ecological continuity.

The speaker's final wish is remarkable in its simplicity. Rather than aspiring toward monumental remembrance or transcendence beyond the material world, the desired resting place is located within a natural landscape characterized by forests, flowing waters, and celestial openness. Death becomes an ecological return rather than a metaphysical escape. Such imagery resonates strongly with contemporary theories emphasizing humanity's embeddedness within biological and geological processes. Environmental philosophers increasingly argue that humans should understand themselves not as external observers of nature but as participants within continuous cycles of material transformation. Eminescu's vision anticipates this ecological ontology with striking clarity. The poem consistently minimizes human exceptionalism. The individual body ultimately becomes part of the same processes governing vegetation, water, soil, and atmospheric change. Mortality therefore acquires ecological rather than exclusively existential significance. Instead of representing annihilation, death signifies participation in larger systems of renewal that transcend individual identity. This perspective also transforms the meaning of memory. Cultural traditions often associate remembrance with monuments, texts, or historical institutions. Eminescu instead locates remembrance within the landscape itself. Forests, winds, waters, and stars become silent witnesses preserving continuity independently of human archives:

“One wish alone have I:
In some calm land
Beside the sea to die;
Upon its strand
That I forever sieep,
The forest near,
A heaven near,
Stretched o’er the peaceful deep.
No candles shine,
Nor tomb I need, instead
Let them for me a bed
Of twigs entwine” (Eminescu, 1989: 120).

Ecocriticism has increasingly explored the relationship between mourning and environmental consciousness. Ecological grief emerges not solely from awareness of individual mortality but from recognition of humanity's dependence upon vulnerable ecosystems. Although writing in the nineteenth century, Eminescu presents mourning as inseparable from landscape. Emotional continuity is achieved not through separation from nature but through intimate belonging within it. The poem further challenges dualistic distinctions between body and environment. The desired burial site symbolizes neither disappearance nor romantic escapism; rather, it affirms that human existence has always been materially connected with the Earth. Such an understanding closely parallels

contemporary environmental humanities, which reject strict divisions between culture and nature in favor of relational models of existence.

Consequently, *Mai am un singur dor* may be understood as articulating an ethics of ecological humility. Human life achieves dignity not through domination of the natural world but through recognition of one's place within enduring cycles of transformation. The landscape becomes both home and final community, dissolving boundaries between personal identity and ecological continuity.

Taken together, *O, rămâi*, *Lacul*, and *Mai am un singur dor* demonstrate that Eminescu consistently imagines nature as an autonomous participant in human existence rather than as decorative scenery. Forests invite ethical dwelling, lakes reveal reciprocity between consciousness and environment, while death itself becomes reintegration into ecological continuity. These poems collectively anticipate several principles central to modern ecocritical thought, including the intrinsic value of nonhuman life, the critique of anthropocentrism, and the recognition that human identity is inseparable from the living systems upon which it depends. In this respect, Eminescu's lyric poetry extends beyond nineteenth-century Romanticism toward an ecological imagination that remains remarkably relevant in the context of twenty-first-century environmental humanities.

Conclusion

An ecocritical reading of Mihai Eminescu's poetry demonstrates that nature occupies a far more significant role than that traditionally assigned by Romantic, biographical, or nationalist interpretations. Throughout his lyric and philosophical works, forests, lakes, rivers, celestial bodies, and seasonal landscapes are not merely aesthetic settings or symbolic extensions of human emotion. Rather, they function as autonomous ecological presences whose rhythms, continuity, and agency reshape the position of the human subject within the natural world.

The analyses of *Fiind băiet păduri cutreieram*, *Revedere*, *O, rămâi*, *Lacul*, and *Mai am un singur dor* reveal a remarkably coherent ecological imagination. The forest emerges as a repository of memory and continuity, preserving cycles of regeneration that transcend individual existence. Water, represented through lakes and flowing streams, becomes a medium of reflection and transformation, illustrating the reciprocity between human consciousness and environmental processes. Meanwhile, celestial imagery expands the ecological perspective beyond terrestrial landscapes, situating humanity within a universe governed by temporal scales that exceed historical and personal experience. These poetic representations consistently challenge anthropocentric assumptions. Human beings do not occupy a privileged position above nature but participate within interconnected ecological systems whose existence neither begins nor ends with human life. Such an understanding closely aligns with fundamental principles of contemporary ecocritical thought, particularly the recognition of the intrinsic value of the nonhuman world, ecological interdependence, and the ethical necessity of rethinking humanity's relationship with the environment.

Although Eminescu wrote in the nineteenth century, long before the emergence of environmental

humanities as an academic discipline, his poetry anticipates many concerns that have become central to present-day ecological discourse. His recurring emphasis on cyclical temporality, coexistence, environmental continuity, and the limitations of human knowledge resonates with modern discussions of sustainability, ecological ethics, and more-than-human relationality. Rather than presenting nature as an inexhaustible resource, Eminescu repeatedly depicts it as a living community that commands respect, contemplation, and humility. This ecocritical perspective does not seek to replace earlier interpretations of Eminescu grounded in Romanticism, philosophy, mythology, or folklore. Instead, it complements these approaches by demonstrating that his poetic vision also contains a sophisticated environmental consciousness capable of engaging contemporary theoretical debates. Reading Eminescu through the lens of ecocriticism therefore expands both Romanian literary studies and international environmental humanities, illustrating how canonical literature continues to generate new meanings in response to evolving intellectual paradigms.

Ultimately, Eminescu's poetry reminds modern readers that ecological awareness is not solely a scientific or political concern but also an aesthetic and ethical experience. His landscapes invite contemplation of humanity's place within the living world while encouraging forms of environmental responsibility grounded in wonder, reciprocity, and respect for the continuity of life. In an age increasingly defined by climate change, biodiversity loss, and environmental uncertainty, Eminescu's poetic imagination remains not only culturally significant but also profoundly relevant to global conversations concerning sustainability and ecological coexistence.

References

Bachelard, G. (1983). *Water and dreams: An essay on the imagination of matter* (E. R. Farrell, Trans.). Dallas Institute Publications. (Original work published 1942)

Buell, L. (1995). *The environmental imagination: Thoreau, nature writing, and the formation of American culture*. Harvard University Press.

Buell, L. (2005). *The future of environmental criticism: Environmental crisis and literary imagination*. Blackwell.

Călinescu, G. (1988). *Viața lui Mihai Eminescu*. Minerva.

Detering, H. (Ed.). (2018). *The Routledge companion to ecocriticism and environmental communication*. Routledge.

Dumitrescu-Bușulenga, Z. (1989). *Eminescu și romantismul german*. Eminescu.

Eminescu, M. (1989). *Poems*. Translated into English by Corneliu M. Popescu. Cartea Românească.

Eminescu, M. (1999). *Opere* (Vols. I–XVI). Academia Română, Fundația Națională pentru Știință și Artă.

Garrard, G. (2023). *Ecocriticism* (3rd ed.). Routledge.

Glotfelty, C. (1996). Introduction: Literary studies in an age of environmental crisis. In C. Glotfelty & H. Fromm (Eds.), *The ecocriticism reader: Landmarks in literary ecology* (pp. xv–xxxvii). University of Georgia Press.

Glotfelty, C., & Fromm, H. (Eds.). (1996). *The ecocriticism reader: Landmarks in literary ecology*. University of Georgia Press.

Heidegger, M. (1971). Building dwelling thinking. In *Poetry, language, thought* (A. Hofstadter, Trans., pp. 141–160). Harper & Row.

Irimia, D. (1994). *Introducere în opera lui Mihai Eminescu*. Polirom.

Love, G. A. (2003). *Practical ecocriticism: Literature, biology, and the environment*. University of Virginia Press.

Marin, A. (2015). Nature and identity in Mihai Eminescu's poetry. *Philobiblon, 20*(2), 235–248.

Merchant, C. (1996). *Earthcare: Women and the environment*. Routledge.

Morton, T. (2007). *Ecology without nature: Rethinking environmental aesthetics*. Harvard University Press.

Morton, T. (2010). *The ecological thought*. Harvard University Press.

Næss, A. (1989). *Ecology, community and lifestyle* (D. Rothenberg, Trans.). Cambridge University Press.

Phillips, D. (2003). *The truth of ecology: Nature, culture, and literature in America*. Oxford University Press.

Rigby, K. (2015). *Dancing with disaster: Environmental histories, narratives, and ethics for perilous times*. University of Virginia Press.

Rueckert, W. (1996). Literature and ecology: An experiment in ecocriticism. In C. Glotfelty & H. Fromm (Eds.), *The ecocriticism reader: Landmarks in literary ecology* (pp. 105–123). University of Georgia Press. (Original work published 1978)

Slovic, S. (1992). *Seeking awareness in American nature writing*. University of Utah Press.

Todorova, M. (2009). *Imagining the Balkans* (Updated ed.). Oxford University Press.

Tuan, Y.-F. (1977). *Space and place: The perspective of experience*. University of Minnesota Press.

Williams, R. (1973). *The country and the city*. Oxford University Press.

Worster, D. (1994). *Nature's economy: A history of ecological ideas* (2nd ed.). Cambridge University Press.

REDESIGNING ANTENATAL CARE: RISK-RESPONSIVE, HYBRID, AND CONTINUITY-BASED MIDWIFERY MODELS.

Döndü Sevimli Güler[4] , Merve İçöz[5]

Abstract

Prenatal care has historically been organized around fixed visit schedules and predominantly face-to-face follow-up. However, substantial variation in clinical risk, social needs, geography, digital access, and care preferences has challenged the traditional one-size-fits-all model. The World Health Organization frames antenatal care not only as surveillance for complications but also as a means to ensure a positive pregnancy experience. At the same time, ACOG's 2025 Clinical Consensus recommends a tailored model that addresses unmet social needs, individualizes visit frequency, and incorporates telemedicine and alternative care modalities. Recent evidence suggests that hybrid prenatal care can maintain maternal and perinatal outcomes while improving access and acceptability in appropriately selected populations. In contrast, midwife continuity models are associated with increased spontaneous vaginal birth and reduced cesarean and instrumental birth. At the same time, newer studies indicate that antenatal risk stratification is useful for planning care intensity but insufficient when used as a static classification, underscoring the need for dynamic reassessment across pregnancy. This review synthesizes current evidence on redesigning antenatal care through risk-adapted, hybrid, and midwifery-continuity-based models and discusses implications for clinical practice, midwifery education, and maternity care policy.

Keywords: Antenatal care, prenatal care, hybrid care, telehealth, midwifery continuity of care, risk-adapted care

Introduction

Antenatal care is a fundamental service in protecting maternal and fetal health; however, the organization of this service has remained largely unchanged for a long time. The World Health Organization defines the primary aim of antenatal care not only as reducing mortality and morbidity but also as ensuring that the woman has a "positive pregnancy experience" and recommends at least eight contacts throughout pregnancy (WHO, 2016). In contrast, classical care schemes used in clinical practice are based on

[4] (Midwife, PhD, RM) Department of Nursing, Faculty of Health Sciences, Sakarya University of Applied Sciences, Sakarya, Türkiye, ORCID ID: 0000-0003-2618-4920 e-mail: donduguler@subu.edu.tr

[5] (Midwife, Msc, Phd Candidate) Sakarya University, Institute of Health Sciences, Department of Midwifery, Sakarya, Türkiye, ORCID ID: 0009-0002-6636-9014 e-mail:merve.icoz@ogr.sakarya.edu.tr

predetermined standard visit numbers for most pregnant women; they do not adequately reflect differences in clinical risk, social vulnerability, care preferences and living conditions.

American College of Obstetricians and Gynecologists (ACOG)'s 2025 Clinical Consensus clearly states that prenatal care has undergone limited change over the past century and that a new care design is now needed. At the heart of this new approach are three key elements: early recognition of unmet social needs, frequency and individualization of follow-up, and appropriate integration of alternative modalities such as telehealth and group care (ACOG, 2025). Therefore, the current debate goes beyond the question of "how many check-ups should be done?" and focuses on the question of "which pregnant woman should receive what kind of care, at what intensity, from which professional team, and with what form of contact?"

The aim of this review is to address the redesign of prenatal care along three intersecting axes: risk-responsive care, hybrid care, and midwifery continuity-based models. These three axes are not independent options; rather, they are complementary components of contemporary, person-centered, and equity-focused prenatal care.

Risk-adaptive prenatal care: from standard schedule to dynamic individualization.

The fundamental rationale behind risk-adaptive care is that providing care to all pregnant women with the same intensity and visitation pattern is not always clinically appropriate. This approach aims to shape the care plan according to the pregnant woman's medical, obstetric, and psychosocial characteristics through a comprehensive assessment in the first trimester. ACOG emphasizes that care planning should consider not only biomedical risks but also accessibility, care responsibilities, language barriers, economic vulnerability, and other social determinants (ACOG, 2025). This emphasis shows that risk adaptation should be considered not only in terms of "disease burden" but also in terms of access to and continuity of care.

However, current studies show that pregnancy risk cannot be reliably managed with a static classification. A prospective study conducted in Kenya reported that existing antenatal risk indicators failed to predict a significant proportion of women experiencing adverse pregnancy outcomes (Cooper et al., 2025). Similarly, a multicenter review conducted in Australia showed that risk stratification could identify women with a higher probability of adverse perinatal outcomes; however, in doing so, it placed a very large group in the "high-risk" category (Brown et al., 2026). These findings suggest that while early triage is beneficial, it should be supported by reassessment over time.

On the other hand, completely abandoning risk stratification does not seem correct either. A large population-based cohort study dated 2026 revealed that antenatal maternal risk strata are significantly

associated with adverse maternal and perinatal outcomes (Wong et al., 2026). Therefore, current evidence positions the future of risk-adaptive care not within the dilemma of "more risk stratification" or "abandoning risk stratification", but within a dynamic, revisited model combined with women-centered decision-making processes. Clinically, this means that the initial risk assessment should be reconsidered in each trimester and whenever a new clinical/social variable emerges.

Hybrid Care And Digital Monitoring: As A Complement, Not A Replacement, For Face-To-Face Care.

Hybrid prenatal care is the planned and holistic use of telehealth contacts in conjunction with face-to-face visits. In the current literature, the hybrid model is considered a promising option, especially in low and medium-risk pregnancies, in terms of counseling, education, outcome sharing, psychological support, some follow-ups, and care coordination. A systematic review and meta-analysis of randomized controlled trials has shown that antenatal telehealth applications are similar to face-to-face follow-ups in terms of numerous maternal and neonatal outcomes; and that they can provide additional benefits in some areas such as weight gain and vaccine hesitancy in over-pregnancy (Kurnaz et al., 2024).

A comprehensive review examining digital antenatal care practices also reports that mobile applications, remote monitoring tools, online counseling, and platform-based models can be used to complement traditional antenatal care, and sometimes as substitutes for certain contacts (Mohamed et al., 2025). However, the common message of these studies is that digital tools cannot automatically replace clinical care; a sustainable hybrid model cannot be established without accurate patient selection, open care protocols, secure data flow, and the ability to quickly return to face-to-face assessment when needed.

Data on the real-life outcomes of hybrid care are also increasing. A large cohort in the US showed that the use of hybrid prenatal care increased during the pandemic, but women living in rural areas had lower access to this model (Hung et al., 2024). A 2025 study on the OB Teleflex program reported that adverse maternal and perinatal outcomes in pregnant women receiving hybrid prenatal telemedicine were not different from those receiving standard care (Lekshmi et al., 2025).While these findings suggest that hybrid care is feasible in terms of clinical safety, they also show that if digital access inequalities are not addressed, the same model can create opportunities for some groups and a new mechanism of exclusion for others.

Therefore, hybrid care should not be conceived as a cost-focused reduction of face-to-face care, but rather as a service that increases access, reduces waiting times, strengthens counseling, and adapts to clinical needs. Home blood pressure monitoring, structured telephone/video consultations, and digital educational

materials are only effective when used in a way that does not overshadow the essential contacts that require face-to-face examination.

Continuity of midwifery care: the relational and clinical backbone of redesign.

One of the strongest areas of evidence for redesigning antenatal care is the continuity of midwifery. Cochrane's 2024 update showed that models based on midwifery continuity increased spontaneous vaginal birth, reduced cesarean section rates, decreased assisted vaginal birth, and could lead to a reduction in episiotomy rates.The same review found no significant deterioration in terms of postpartum hemorrhage and neonatal intensive care/specialty care admission (Sandall et al., 2024). These results suggest that midwifery continuity creates a significant change not only in the positive care experience but also in the intervention pattern.

One of the most important advantages of continuity of midwifery care is that the relationship maintained with the same professional or a small team increases trust and openness throughout pregnancy. In such a model, the pregnant woman can share her symptoms earlier; and the caregiver can better recognize clinical changes, social vulnerabilities, and emotional needs over time. Therefore, continuity of midwifery can be considered as a relational infrastructure that increases the clinical applicability of risk-responsive care. Especially in low-risk and mixed-risk pregnancies, this model can contribute to the continuation of safe care while limiting over-medicalization (Sandall et al., 2024).

The important point here is that midwifery-focused models should be considered not as a structure opposed to the obstetrician, but as the core of an integrated prenatal care system. In complex pregnancies, joint care under the leadership of an obstetrician may be necessary; however, this does not mean that the pregnant woman should be completely deprived of continuity of midwifery. Indeed, the current redesign approach supports models where the role of midwifery is not eliminated as the risk level increases, but is redefined in terms of coordination, education, counseling, and continuity of care.

Group Prenatal Care: A Model That Makes The Social Support And Empowerment Dimension Visible.

Group prenatal care is a model in which women of the same gestational age come together at specific intervals to receive clinical monitoring, education, and peer interaction. In recent years, studies have been published showing that this model can be beneficial not only in terms of satisfaction and participation but also in terms of some perinatal outcomes. An efficacy study conducted in Malawi reported that women who received group antenatal care experienced higher peer engagement, greater empowerment, higher

care satisfaction, and more antenatal contact (Patil et al., 2025).These results show that group care has significant potential, especially in terms of health education, shared learning, and care experience.

A quasi-experimental study from 2025 evaluating the Centering Pregnancy model showed that women in group care had increased access to prenatal visits, reduced rates of preterm birth and perinatal mortality, longer gestation periods, and improved birth weight outcomes (Park et al., 2025). Although group prenatal care is not the only correct model for all pregnant women, it can be a powerful component of hybrid and continuous care, especially in low-risk pregnancies. The group approach supports the transformation of the woman from a passive recipient of clinical monitoring to an active subject who shares experiences, asks questions, develops self-care skills, and participates in care decisions. However, time, space, trained facilitators, and institutional planning are necessary for the sustainability of group care. In addition, the limitations of group care should be carefully considered in high-risk pregnancies, in cases requiring high privacy, or in situations requiring intensive individual clinical monitoring. Therefore, while group prenatal care is an important element of flexible care design, it should be adapted to the local context in each system.

Implications For Clinical Practice, Education, And The Healthcare System.

When current literature is considered together, it is seen that the future prenatal care model should be based on three principles. First, care should be initiated with a comprehensive assessment in early pregnancy and the risk should be dynamically re-evaluated throughout pregnancy (ACOG, 2025; Wong et al., 2026). Second, continuity of midwifery care should be strengthened as the basic model in low and moderate-risk pregnancies; and the obstetrician's contribution should be gradually expanded in the form of joint care and counseling as the risk increases Sandall et al., 2024). Third, hybrid contacts should be used in a planned manner for counseling, education, sharing results and some stable follow-ups; however, they should not blindly replace face-to-face care Kurnaz et al., 2024; Lekhsmi et al., 2025).

From the perspective of postgraduate midwifery education, this transformation requires the inclusion of competencies not only in clinical skills but also in risk communication, digital health literacy, ethical responsibilities in telehealth, interprofessional collaboration, and group facilitation. At the health system level, the redesign of prenatal care should not be interpreted as a simple “visit reduction” policy. Redesign is only meaningful as a women-centered, data-driven program that aims to reduce inequalities. Otherwise, the discourse of hybrid care or risk-responsive care may push certain groups of women to the margins of care instead of truly facilitating access.

Therefore, service planning should consider special arrangements for rural areas, migrant women, low-income groups, adolescent pregnant women, and women with high psychosocial burdens. Access to

digital devices, internet connectivity, language support, and cultural suitability counseling are prerequisites for the equitable implementation of hybrid care. Similarly, a collaborative decision-making approach that takes into account care preferences for each pregnancy should form the ethical foundation of contemporary prenatal care.

Table 1. Key components and implementation notes for redesigning antenatal care.

Component	**Key contribution**	**Main limitation**	**Application note**
Risk-aware maintenance	It individualizes the intensity of care according to clinical and social needs.	Statik sınıflama gebelikte sonradan gelişen riski kaçırabilir.	The initial assessment should be reviewed each trimester and whenever a new problem develops.
Hybrid care	It can increase access, flexibility, and continuity of consultation.	The digital divide, lack of home monitoring equipment, and protocol deficiencies reduce effectiveness.	It should be used as a complementary model for appropriate contact, not as a replacement for face-to-face care..
Continuity of midwifery care	It strengthens trust, coordinates caregiving, and promotes a more physiological birth.	It requires organizational structure and workforce planning.	In low/moderate risk pregnancies, the baseline model may be the core of shared care in high-risk pregnancies.

Component	Key contribution	Main limitation	Application note
Group prenatal care	Peer support, empowerment, health education, and care can improve satisfaction.	Time, space, facilitating and logistical requirements are numerous..	It is a strong complement to hybrid and continuous care in low-risk pregnancies..

Conclusion

Redesigning prenatal care is not a matter of reducing the number of care sessions or superficially adding technology to the system. The essential transformation is to move away from viewing the pregnant woman as a homogeneous patient group and to treat her as an individual whose risks and needs change over time. Current literature shows that risk adaptation is valuable when dynamic, hybrid care is safe and increases accessibility when properly designed, and midwifery continuity is transformative in terms of both clinical outcomes and care experience (ACOG, 2025; Park et al., 2025). Therefore, the future prenatal care model should be built on a flexible care architecture that is person-centered, equity-oriented, midwifery-led, and supported by digital tools when necessary.

REFERENCES

World Health Organization. (2016). WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization; 2016.

American College of Obstetricians and Gynecologists.(2025).Tailored prenatal care delivery for pregnant individuals: ACOG Clinical Consensus No. 8. Obstet Gynecol, 145(5):565-577. doi:10.1097/AOG.0000000000005889.

Cooper JE, et al.(2025). Risk stratification during antenatal care failed to identify most mothers who experienced adverse pregnancy outcomes: a prospective study from Kakamega County, Kenya. *Trop Med Int Health*. 2025;30(6):531-538. doi:10.1111/tmi.14110.

Brown J, et al.(2026). Does antenatal risk stratification align with the initial and eventual models of care allocation? A 5-year multi-centre review of risk factors and outcomes. *Aust N Z J Obstet Gynaecol*, 66(1):e70058. doi:10.1111/ajo. 70058.

Wong C, Crawford K, Hong J, Rosser S, Flenady V, Leisher S, et al. (2026).Maternal risk stratification and planned birth improve pregnancy outcomes at term: a population-based cohort study. *Am J Obstet Gynecol*, 234(2):507-522. doi:10.1016/j.ajog.2025.10.005.

Kurnaz D, Şenoğlu A, Karaçam Z.(2024). The impact of antenatal telehealth services on maternal and neonatal out comes, a comparison of results before and during the COVID-19 pandemic: a systematic review and meta-analysis. *Midwifery*.34:104017. doi:10.1016/j.midw.2024.104017.

Mohamed H, Ismail A, Sutan R, Abd Rahman R, Juval K.(2025). A scoping review of digital technologies in antenatal care: recent progress and applications of digital technologies. *BMC Pregnancy Childbirth*, 25(1):153. doi:10.1186/s12884-025-07209-8.

Hung P, Yu J, Harrison SE, Liu J, Promiti A, Odahowski C, et al.(2024). Racial and ethnic and rural variations in the use of hybrid prenatal care in the US. *JAMA Netw Open*, 7(12):e2449243. doi:10.1001/jamanetworkopen. 2024.49243.

Lekshmi D, Nader S, Roberts-Barry J, Baecher Lind LE, St Charles A, Werner EF, et al. (2025).Perinatal outcomes among patients using OB Teleflex, a hybrid prenatal telemedicine program. *J Obstet Gynaecol Can*, 47(6):102911. doi:10.1016/j.jogc.2025.102911.

Sandall J, Fernandez Turienzo C, Devane D, Soltani H, Gillespie P, Gates S, et al. (2024). Midwife continuity of care models versus other models of care for childbearing women. *Cochrane Database Syst Rev*, 4(4):CD004667. doi:10.1002/14651858.CD004667.pub6.

Patil CL, Norr KF, Kapito E, Liu LC, Mei X, Chodzaza E, et al.(2025). Group antenatal care positively transforms the care experience: results of an effectiveness trial in Malawi. *PLoS One*, 20(6):e0317171. doi:10.1371/journal.pone.0317171.

Park CH, Driver N, Richards RC Jr, Ward P.(2025). The effects of Centering Pregnancy: a quasi-experimental evaluation. *Healthcare (Basel)*, 13(9):1052. doi:10.3390/healthcare13091052.

The Behavioural Impact of Inflation Expectations on the Consumer Confidence Index in Turkey: An Econometric Analysis

Ezgi Doğan[6], Burhan Doğan[7]

Abstract

Mainstream economics assumes that individuals are rational and always act in a manner that maximises their own interests. However, developments in behavioural economics show that cognitive, psychological, and environmental factors influence individuals' economic choices. Researchers also argue that individuals possess bounded rationality. Factors such as expectations, perceptions, risk attitudes, and confidence levels influence individuals' economic decisions. The macroeconomic implications of these factors can be quantitatively monitored, particularly through inflation expectations and the consumer confidence index. This study will analyse the relationship between these variables using inflation expectations and consumer confidence index data for the period 2015-2025 in Turkey, employing a simple linear regression model. The Turkish Statistical Institute measures the Consumer Confidence Index of households through surveys. These surveys assess individuals' general economic perception, future expectations, and savings propensity. This information enables an analysis of attitudes towards the economy. The Central Bank of the Republic of Turkey measures inflation expectations through the Market Participants Survey. The study uses data compiled from the databases of these two institutions. The empirical findings of the study indicate that increases in inflation expectations have a statistically significant negative effect on consumer confidence. This situation highlights that perceptions and expectations, as well as macroeconomic indicators from previous periods, are decisive factors in individuals' economic decision-making processes. Therefore, policymakers must assess consumer behaviour when determining economic policies. Communication strategies and expectation anchoring mechanisms play a crucial role in shaping economic behaviour. They influence individuals' perceptions, risk assessments, and decision-making through behavioural channels during uncertainty.

Keywords: Behavioural economics, rationality, inflation expectations, consumer confidence

JEL Code: D03, D01, E31, E52, D12

INTRODUCTION

Individuals making economic decisions in daily life are not only influenced by current economic conditions, but also by their expectations and perceptions of the future. In the economy, especially during

[6] Dr., Yuksek Ihtisas University, ezgi.dogan@yuksekihtisas.edu.tr, 0000-0002-7751-7687

[7] Prof.Dr., Anadolu University, burhand@anadolu.edu.tr, 0000-0002-8706-4124

periods of high inflation, individuals' expectations about the future of the economy directly affect important economic decisions such as consumption and saving. For these reasons, expectations about the future and confidence in the economy fundamentally determine economic stability.

Mainstream economic theory assumes that individuals are perfectly rational and make economic decisions to maximize their utility. However, developments in behavioral economics, whose foundations were laid in the 1960s, have revealed that cognitive biases, psychological factors, and environmental conditions also play a significant role in individuals' decision-making processes. The concept of bounded rationality, developed by Herbert Simon, shows that limitations in individuals' knowledge and cognitive capacities prevent them from making perfectly rational decisions. Within this framework, the development of behavioral economics has shown that individuals do not always make perfectly rational economic decisions, that psychological and environmental factors are influential in the decision-making process, and that individuals' perceptions and expectations, in particular, play a role. Therefore, not only objective indicators but also individuals' subjective evaluations should be taken into account when explaining economic decisions and behaviors (Engeloğlu, 2021).

In behavioral economics, expectations, perceptions, and confidence levels are considered fundamental elements of the economic decision-making process. In particular, changes in inflation expectations can influence individuals' assessments of the economic future and lead to significant shifts in consumer confidence levels. Negative changes in expectations can increase individuals' perception of economic uncertainty and weaken confidence in the economy.

The Consumer Confidence Index is one of the key indicators measuring individuals' assessments of the current economic situation and their expectations for the future. Changes in the index can affect consumption expenditures, saving tendencies, and overall economic activity. Therefore, consumer confidence is considered an important behavioral indicator reflecting the attitudes and behaviors of economic actors (Eyüpoğlu and Eyüpoğlu, 2018).

Consumer confidence indices provide valuable information about the course of economic activity by measuring individuals' assessments of current economic conditions and their expectations for the future (Engeloğlu, 2021). To calculate the Consumer Confidence Index, a monthly consumer trends survey is conducted to measure consumers' assessments of their personal financial situation and the general economy, as well as their expectations for the future. In addition, trends regarding planned future expenditures and savings are identified. The consumer confidence index calculated after the survey results takes a value between 0 and 200. A value greater than 100 indicates optimism in consumer confidence, while a value less than 100 indicates pessimism (Eyüpoğlu & Eyüpoğlu, 2018).

The behavior of economic actors is influenced not only by macroeconomic indicators but also by

psychological factors. Therefore, indicators such as the Consumer Confidence Index provide important information from a behavioral economics perspective (Şeker & İslamoğlu, 2024).

During periods of economic uncertainty, individuals' inflation expectations tend to increase, and their assessments of the overall economic outlook become negative. This demonstrates that psychological factors play a significant role in the formation of expectations (Reiche & Meyler, 2022).

The aim of this study is to examine the relationship between inflation expectations and the Consumer Confidence Index in Turkey for the period 2015-2025 from a behavioral economics perspective. Monthly data for this period were used. This study aims to contribute to the literature by investigating the relationship between inflation expectations and consumer confidence in Turkey within the framework of behavioral economics. The unique aspect of the study is that it provides empirical evidence by considering the psychological and behavioral dimensions of the relationship between inflation expectations and consumer confidence in an area where empirical studies are relatively limited.

LITERATURE REVIEW

Mainstream economic theory assumes that individuals are rational, possess complete information, and make decisions to maximize their utility. However, the behavioral economics approach criticizes this assumption. It argues that individuals cannot be completely rational in their economic decisions and preferences, and that cognitive limitations, emotions, beliefs, and environmental factors play a significant role in individuals' decision-making processes. In this context, Simon (1955) introduced the concept of bounded rationality, arguing that individuals are not entirely rational in their decision-making processes. According to Simon, individuals do not necessarily choose the best alternative; instead, they tend to choose the option that is "good enough" under cognitive and environmental constraints. Therefore, economic decisions are shaped not only by objective information but also by individuals' perceptions, expectations, and psychological processes (Simon, 1955; Doğan & Doğan, 2022).

Prospect Theory, developed by Kahneman and Tversky (1979), suggests that individuals do not behave entirely rationally when making decisions under risk and uncertainty. Instead, they shape their decisions according to reference points and place more importance on losses than gains. This means that economic expectations and perceptions can have significant effects on individuals' economic behavior.

Sadeghzadeh (2018), argues that the Consumer Confidence Index can be considered a psychological indicator in economic decision-making processes and can influence the behavior of economic actors.

Goyal & Parab (2019), show that household inflation expectations are influenced not only by demographic characteristics but also by factors such as economic outlook, income level, and consumer

confidence. The study also notes that central bank communication plays a significant role in the formation of expectations.

Engeloğlu (2021) states that psychological factors play a significant role in economic decision-making processes. He notes that consumer confidence indices are useful as important indicators for measuring individuals' economic expectations and attitudes.

Reiche & Meyler (2022), in their study, state that consumers' inflation expectations are not only dependent on actual inflation but also on the level of economic uncertainty and the level of confidence in the economy. The study indicates that a negative assessment of the economic outlook can increase individuals' inflation expectations and decrease their level of economic confidence.

Şeker & İslamoğlu (2024), in their study, reveal that the Consumer Confidence Index interacts with various macroeconomic indicators and that consumers are influenced by psychological factors when evaluating economic developments.

A literature review shows that consumer confidence reflects not only current economic conditions but also individuals' expectations for the future. Therefore, central banks' communication strategies, forward guidance practices, and expectation fixing mechanisms are considered important tools for maintaining economic confidence.

Although numerous studies examine the relationship between inflation expectations and consumer confidence, most of these studies primarily focus on macroeconomic indicators. Studies addressing this relationship from a behavioral economics perspective for Turkey are limited in the literature. This study aims to fill a gap in the literature and contribute to it by evaluating the relationship between inflation expectations and consumer confidence within the framework of expectations, perceptions, and trust.

DATA AND METHODOLOGY

This study uses monthly data for Turkey covering the period 2015:01–2025:12. Inflation expectations data was compiled from the Turkish Central Bank's Electronic Data Distribution System (EVDS) database. The "12-Month Annual CPI Expectation" series, published within the scope of the TCMB Market Participants Survey, was used for inflation expectations data. Consumer confidence index data was compiled from the Turkish Statistical Institute database. This data is the seasonally adjusted Consumer Confidence Index data.

A simple linear regression model was chosen to examine the effect of inflation expectations on the Consumer Confidence Index. The estimated model is expressed as follows:

Research Hypothesis

H1: Inflation expectations negatively affect consumer confidence in Turkey.

$$CCIt = \beta 0 + \beta 1\ INFEXPt + \varepsilon t$$

CCI: denotes the Consumer Confidence Index.
INFEXP: denotes inflation expectations.
β_0: denotes the constant term.
β_1: denotes the coefficient of inflation expectations.
ε: denotes the error term.

RESULTS

The empirical findings of the study are evaluated in two stages. In the first stage, descriptive statistics are presented in order to reveal the main characteristics of the variables used in the analysis. In the second stage, the effect of inflation expectations on the Consumer Confidence Index is examined by employing a simple linear regression model. The findings obtained from the analysis are presented below, respectively.

Table 1: Descriptive Statistics

Variables	Number of Observations	Mean	Minimum	Maximum	Standard Deviation
Inflation Expectations	132	18.93	6.69	45.28	11.76
Consumer Confidence Index	132	82.44	63.40	95.30	7.11

Source: Authors' calculations based on CBRT EVDS and TURKSTAT data.

As shown in Table 1, inflation expectations increased considerably during the analysis period. A particularly pronounced rise in inflation expectations is observed after 2021. In contrast, the Consumer Confidence Index generally exhibited a downward trend over the same period.

Table 2: Regression Results

Variables	Coefficient	Standard Error	t-statistic	p-value
Intercept	90.06	1.40	64.21	<0.001
Inflation Expectations	-0.399	0.041	-9.84	<0.001

Source: Created by author

Table 2 presents the results of the regression analysis, where the Consumer Confidence Index is specified as the dependent variable. The findings indicate a negative and statistically significant relationship between inflation expectations and consumer confidence. According to the estimated coefficient, a one-point increase in inflation expectations leads to an approximately 0.4-point decline in the Consumer Confidence Index.

These findings are consistent with the results reported by Reiche and Meyler (2022) and Goyal and Parab (2019), both of whom concluded that deteriorating economic expectations adversely affect economic

confidence.

Table 3: Model Summary Statistics

Number of Observations	R^2	Adjusted R^2	F-statistic	Prob(F)
132	0.426	0.421	96.80	<0.001

Source: Created by author

The model results indicate that the regression model is statistically significant as a whole (Prob(F) < 0.001). Moreover, the R^2 value suggests that approximately 43% of the variation in the Consumer Confidence Index is explained by inflation expectations.

CONCLUSION

This study examines the relationship between inflation expectations and the Consumer Confidence Index in Turkey from a behavioral economics perspective, using monthly data covering the period 2015-2025. The findings show that an increase in inflation expectations has a negative and statistically significant effect on consumer confidence. The results demonstrate that individuals' economic decision-making processes are not solely influenced by current macroeconomic indicators, but also by expectations, perceptions, and confidence levels.

The study's findings support the existing literature that considers the Consumer Confidence Index as an important behavioral indicator reflecting individuals' psychological states and economic expectations. Sadeghzadeh (2018) and Engeloğlu (2021) argue that the Consumer Confidence Index reflects psychological factors in economic decision-making processes and serves as an important indicator in explaining individuals' economic attitudes. Similarly, Reiche & Meyler (2022) suggest that economic uncertainty and negative economic sentiment can increase consumers' inflation expectations while decreasing economic confidence. In this context, the results of the present study further confirm the significant role of behavioral factors in individuals' economic decision-making processes.

Considering both the findings of this study and the broader literature, it is essential for central banks to develop transparent, consistent, and predictable communication strategies. Goyal & Parab (2019) emphasize that central bank communication plays an active role in the formation of household inflation expectations, and that effective communication strengthens expectation stabilization. Therefore, strengthening expectation management and expectation stabilization mechanisms plays a critical role in ensuring and maintaining confidence in the economy, as well as increasing the effectiveness of monetary policy. In this context, communication policies and public guidance implemented by central banks are considered important tools in shaping the inflation expectations of economic actors. Maintaining effective communication can contribute to expectation stabilization (Goyal & Parab, 2019).

Furthermore, in the formulation of economic policies, not only realized macroeconomic indicators but also behavioral variables such as consumer confidence and expectation indicators should be considered to increase policy effectiveness. Especially during periods of economic uncertainty, providing the public with accurate, timely, and understandable information can contribute to the formation of healthier economic perceptions among individuals, thus supporting stronger economic stability.

In conclusion, this study demonstrates that expectation management is critical for economic stability and provides an empirical contribution to the literature by examining the relationship between inflation expectations and consumer confidence in Turkey from a behavioral economics perspective.

However, the study has some limitations. The analysis was conducted using only inflation expectations and the Consumer Confidence Index. Future studies could provide more comprehensive analyses by including additional variables such as exchange rate expectations, unemployment figures, and consumer-perceived inflation levels in the model.

REFERENCES

Doğan, B., & Doğan, E. (2022). Altruism and rationality within the framework of behavioral economics. *International Journal of Business and Applied Social Science*, 8(2), 38–45. https://doi.org/10.33642/ijbass.v8n2p4

Engeloğlu, Ö. (2021). Davranışsal iktisat temelinde psikolojinin ekonomideki rolü: Türkiye üzerine değerlendirme. In Ekonominin Güncel Konuları (pp. 299–334). Gazi Kitabevi.

Eyüboğlu, S., & Eyüboğlu, K. (2018). Tüketici güven endeksi ile Borsa İstanbul sektör endeksleri arasındaki ilişkinin araştırılması. *Dokuz Eylül Üniversitesi İktisadi İdari Bilimler Fakültesi Dergisi,* 33(1), 235-259. https://doi.org/10.24988/deuiibf.2018331715

Goyal, A., & Parab, P. (2019). *Modeling consumers' confidence and inflation expectations* (WP-2019-025). Indira Gandhi Institute of Development Research. http://www.igidr.ac.in/pdf/publication/WP-2019-025.pdf

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-291. https://doi.org/10.2307/1914185

Reiche, L., & Meyler, A. (2022). *Making sense of consumer inflation expectations: The role of uncertainty* (ECB Working Paper No. 2642). European Central Bank. https://doi.org/10.2139/ssrn.4036097

Sadeghzadeh, K. (2018). Borsanın psikolojik faktörlere duyarlılığı: oynaklık endeksi (vıx) ve tüketici güven endeksi (TGE) ile BIST 100 endeksi arasındaki ilişkiler. *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 19(2), 238-253. https://izlik.org/JA37MD76KN

Şeker, M., & İslamoğlu, M. (2024). Tüketici güven endeksi ve seçilmiş makroekonomik göstergeler arasındaki ilişkinin ekonometrik analizi: Türkiye örneği. *Üçüncü Sektör Sosyal Ekonomi Dergisi*, 59(2), 1088-1101. https://doi.org/10.15659/3.sektor-sosyal-ekonomi.24.06.2269

Simon, H. A. (1955). A behavioral model of rational choice. *The quarterly journal of economics*, 99-118.

Central Bank of the Republic of Türkiye. (2025). *Electronic Data Delivery System (EVDS)*. https://evds2.tcmb.gov.tr/

Turkish Statistical Institute. (2025). *Consumer confidence index statistics.* https://data.tuik.gov.tr/

Financial Insecurity: Fostering or hindering Personal Growth and Engagement

Haris Muminovic[8] Andrijana Bojadjievska Danevska[9] Fatime Ziberi[10]

Abstract

Financial insecurity constitutes a meaningful psychological burden with broad consequences for individual well-being and personal development. Drawing on Conservation of Resources (COR) Theory, and the Job Demands Resources (JD-R) model, and Seligman's PERMA framework, this study explores whether financial insecurity operates primarily as a barrier to or a driver of personal growth, and the extent to which positive work attitudes may mitigate the psychological costs of financial strain.

A cross sectional survey was conducted on a heterogeneous sample of 69 participants, diverse in age, gender, educational background and income. Results indicated statistically significant negative association between financial insecurity and personal growth ($b=-0.353$, $p = 0.0017$), suggesting that greater financial strain is linked to diminished self-development. This direct effect lost statistical significance once work attitudes and demographic variables were introduced. Positive attitudes towards work emerged as a robust and significant predictor of personal growth ($b = 0.482$, $p<0.001$).

These results indicate that financial insecurity functions predominantly as a constraining force, eroding the psychological and cognitive resources upon which personal development depends. Positive work attitudes represent a critical motivational asset capable of sustaining personal growth even during financial adversity.

The study advances the integration of resource based and eudaimonic well-being perspectives with emerging research on financial scarcity, offering practical implications for workplace interventions, organizational policy and directions for future research.

Keywords: financial insecurity, personal growth, work attitudes, psychological resources, cognitive functioning, well-being

JEL Codes: D14, I31, J28, G41

[8] Asst. Prof. Dr, Faculty of Culture and Tourism, University of Donja Gorica, Podgorica, Montenegro, haris.muminovic@udg.edu.me, ORCID ID 0009-0006-0912-6189

[9] Assoc. Prof. Dr, Faculty of Economic and Administrative Sciences, International Balkan University, Skopje, NRM, andrijanab.danevska@ibu.edu.mk, ORCID ID: 0000-0001-8969-0105

[10] PhD Candidate**,** Psychological Counseling and Guidance, Faculty of Education**,** International Balkan University, Skopje, NRM, f.ziberi@ibu.edu.mk, ORCID ID:0000-0002-4715-8601

1. Introduction

Financial insecurity, characterized with uncertainty about income stability, sufficiency and future financial prospects, plays a significant role in shaping the personal identity, growth and development. Financial insecurity can affect mental well-being, decision making, and long-term self-development. The widespread nature if this phenomenon is striking, i.e. research shows that approximately 42% of the adult's report money as negatively affecting their mental health, manifesting as stress, worry, anxiety, and persistent feelings of insecurity with Millennials being the most financially anxious demographic group (Securian Financial, 2023). Additionally, the longitudinal evidence from the British Household Panel survey demonstrates that perceived future financial risks are more damaging to mental health than realized financial losses, and that these negative effects are consistent across all categories of income distribution, i.e. individuals have psychological consequences even when financial collapse is not present or did not materialize (Rohde et al., 2018). Consequences of financial insecurity further expand on individual level. According to Modern Health (2026), appx. 60% of employees report money related stress, where the U.S. employees are losing an estimated amount of 250$ billion on annual level in lost productivity and distraction, while around 70% of Generation Z's and Millennial's employees state that the financial insecurity directly impairs their work performance. According to the same report, the evidence shows that approximately 38% of financially worried employees report reduced job satisfaction and 26% report that they have worsened their workplace engagement. This evidence emphasize that financial insecurity is not only a psychological burden but and a systematic concern that affects motivation, engagement and the conditions under which personal growth happens.

On the other hand, financial insecurity is not found only as a limiting factor to personal growth. Indeed, research shows that difficult circumstances can serve and as a catalyst for growth. Tedeschi and Calhoun (1996, 2009) established the concept of Post Traumatic Growth, i.e. the experience of positive psychological change, that comes from the struggle with highly challenging life crises, noting that this growth can coexist with ongoing stress and will not replace it. In economic contexts, research on individuals that deal with financial constraints has found that many of them develop resilience, adaptability and strong work-related skills and competencies that contribute to long term professional and personal development (Paglinawan & Orbilla, 2025).

The purpose of this study, therefore, is to examine the direct relationship between financial insecurity and personal growth, while accounting for demographic variables and legal aspects of financial vulnerability. Additionally, it takes into consideration and the employees' attitudes toward work. More specifically, the study focuses on answering the following research questions:

1. To what extent is financial insecurity associated with personal growth?

2. Does financial insecurity act primarily as a constraint or as a catalyst for personal growth?

3. To what extent do positive attitudes toward work predict personal growth and can they act as cushion for the potential negative effects of financial insecurity?

4. Do demographic factors, such as age, gender, education and income, significantly influence the relationship between financial insecurity and personal growth?

In that sense this paper seeks to examine the direct relationship between financial insecurity and personal growth, investigate the role of attitudes toward works as a motivational resource, explore the potential mediating effect of work attitudes and to consider legal dimensions of finance insecurity and their implications for well-being. Finally, the study is grounded on Conservation of Resources (COR) Theory (Hobfoll, 1989, 2001), the Job Demands-Resources (JD-R) model (Bakker&Demerouti, 2007, 2017; Baker et al., 2023), Ryff's multidimensional model of wellbeing (Ryff, 1989, Ryff & Keyes, 1995), and the PERMA model of psychological well-being (Seligman, 2011, 2017). These frameworks, combined together, explain how financial insecurity influences personal growth through resource loss, motivational processes and eudaimonic functioning.

2. Research Data and Methodology

The empirical analysis of this study was based on a survey dataset with a final sample of 69 respondents. In the core analytical framework financial insecurity is considered as an independent variable, while the personal growth as the dependent variable. Age, gender, education and income were introduced as demographic control variables. In the extended specification of the model's attitudes toward work were tested as a mediating mechanism linking financial insecurity to personal growth. The analysis was based on ordinary least square regression (OLS), and because heteroskedasticity can distort conventional standard errors in linear regression, all models were further estimated with HC3 heteroskedasticity – robust standard errors, which are commonly recommended for small to moderate samples (Long&Ervin, 2000; Hayes & Cai, 2007), such as this one.

First, a baseline model tested the direct association between financial insecurity and personal growth. Second, a controlled model included gender, age, education, and income to examine whether the main effect remained after accounting for demographic background. Third, separate regression accessed whether income predicts financial insecurity, and finally the fourth mediation analysis tested whether attitudes towards work transmit part of the effect of financial insecurity on personal growth. To evaluate the mediation, the study estimated the indirect effect of financial insecurity on personal growth through attitudes toward work and supplemented the regression framework with bootstrap confidence interval. Bootstrap methods are generally preferred for indirect-effect testing because the sampling distribution of

mediated effects is often non-normal (Preacher & Hayes, 2008). At the same time, given the relatively small sample size, the mediation findings should be interpreted cautiously and as exploratory, since the indeirect effects often require larger samples for stable statistical detection (Fritz & MacKinnon, 2007).

For the main variables used in this study, composite variables were created by averaging related questionnaire items, as shown in Table 1.

Table 1: Variables included in research methodology

Composite Variable	Items	Type of item	Conceptualization
Financial insecurity	- income sufficiency security - income stability security - low-income status	Composite score of multiple Likert items	A threat to condition and energy resources according to the COR theory and job demand in JD-R model
Attitudes toward work	- autonomy in tasks - self-expression - absence of pressure	Composite score of multiple Likert items	Motivational resource in the JD-R model.
Personal growth	- perceived usefulness - problem handling ability - Clarity of thinking - Closeness to others - Independent mindedness	Composite score of multiple Likert items	Core dimension of eudaimonic well-being.
Demographic variables	- gender - age (ordinal) - education level (ordinal) - income level (ordinal)	/	Control variables

Source: Authors' data

Cronbach's alpha was calculated for all composite indices to assess the internal consistency. The Financial insecurity scale produces alpha od 0.674 indicating marginal but acceptable reliability for exploratory research. Attitudes toward work scale demonstrated good internal consistency (α=0.834), while the Personal growth scale demonstrated good reliability (α=0.861).

3. Literature Review

The theoretical foundations of this study rests on three complementary frameworks, that is COR theory, the JD-R model and Seligman's PERMA model of thriving, each of which presents distinct dimensions of

the relationship between financial insecurity, work attitudes and personal growth.

Cor theory posits that individuals strive to obtain, retain and protect valued resources, including conditions such as financial stability, personal characteristics such as optimism and self-efficacy, and energies such as time and money (Hobfoll, 1989).

Psychological stress arises from actual or threatened resource loss, with loss being more salient than gain and frequently triggering cascading loss spirals that rapidly exhaust adaptive capacity (Hobfoll, 2001). Financial insecurity presents a direct threat to both condition and energy resources, consuming the psychological reserves, such as clarity of thinkinh, problem solving capacity, and self-expression, which are essential for personal growth and well-being. Cronic financial pressure leads individuals towards cognitive narrowing and reduction in future oriented planning, thereby limiting rather than motivating self-development (Hobfoll, 1989; Weinstein & Stone, 2018). Recent evidence from meta-analysis confirms the harmful effects of financial scarcity on cognitive performance (de Almeida et al., 2024), and financial worries are strongly associated with psychological distress that further limits cognitive capacity (Tyu et al., 2022; Patel, 2020). More importantly, COR theory also allows and for resource gain spirals, meaning that when individuals successfully protect or rebuild key resources through positive work engagement or social support, upward momentum can support personal development. Hamm et al. (2026) provide longitudinal evidence for this pathway, finding that secondary control, i.e. the capacity to reframe adversity, predicted improvement in personal growth during periods of financial hardship, consistent with a resource gain mechanism operating under conditions of scarcity.

The JD-R model, building on COR principles, distinguishes the job demands, such as financial insecurity from job resources that help achieve goals, reduce demands, or simulate growth and learning (Bakker & Demerouti, 2007, 2017: Baker et al., 2023). The JD-R model makes a distinction between two processes: health-impairment pathway in which job demands exhaust resources and reduce well-being, and motivational pathway in which the resources foster engagement and personal growth, thereby creating upward spirals (Bakker & Demerouti, 2017). Positive work attitudes, including the perceived usefulness, autonomy, engagement and low pressure, function here as a key motivational resource that activate later processes, buffering the negative effects of demands (Baker et al, 2023; Rasdi et al., 2021). Empirical evidence supports these effects, for example Zhang et al. (2020), in their study of employees during COVID 19, found that unemployment was the primary risk factor for impaired work attitudes, while resilience and optimism functioned as the main protective factors. Their survey data further showed that intrinsic work motivations persist under financial pressures, with nearly 7 in 10 adults reporting that they work to feel useful and nearly half noted the social contribution as motivation (Pew Research Center), suggesting that meaning-oriented work attitudes may xontinue exist beyond the material financial

circumstances.

Personal growth, as a central dimension, of the eudaimonic well-being, comprises of continued development, openness to new experiences, realization of one's potential, and perceived improvement in self and in the behaviour over time (Ryff, 1989; Ryff & Keyes, 1995). In this study personal growth was operationalized as a composite reflecting autonomy, self-expression, problem-solving ability, clear thinking and social connection. Work engagement, characterized by vigour, dedication and absorption (Schaufelli & Bakker, 2004), serves as both an outcome and a facilitator of personal growth, and within the JD-R framework, positive work attitudes facilitate the engagement that in turn supports broader psychological functioning (Rasdi et al., 2012).

Longitudinal research using the MIDUS (Midlife in U.S.) national cohort has established that personal growth pathways are substantially shaped by socioeconomic factors, i.e. that personal growth and purpose in life decline most steeply with increasing age, particularly beyond 61 years (Springer et al, 2025), making the age and education critical demographic moderators.

Furthermore, when discussing on the evidence about adversity to growth pathway, the evidence is mixed. Balanza et al. (2025), by studying working students under economic constraints, found that many of them developed resilience, adaptability, and strong work ethics as direct result of the financial necessity, which is consistent with the post-traumatic growth literature's claim that growth is possible when the enabling psychological conditions are present. However, Infurna et al. (2022), provided an important empirical caution in their two-year long longitudinal study of midlife adults, i.e. adversity was more commonly associated stagnation or decline in well-being outcomes, including the meaning making and life satisfaction, than with growth, and only minority of participant had durable positive change in the aftermath of hardship.

For the understanding of the conditions under which growth occurs, rather than assuming that it will, there is a need for closer examination of the psychological resources that individuals use. By complementing Ryff's model, Seligman's (2011) PERMA model of well-being conceptualizes flourishing as comprising five measurable elements, i.e. Positive Emotion, Engagement, Relationship, Meaning and Accomplishment. Unlike the traditional subjective well-being measures, PERMA treates these elements as distinct building blocks of flourishing rather than mere contributors to happiness (Basistha & Bhuyan, 2025).

Although some scholars have criticised the model as potentially redundant with existing well-being measures (Goodman et al., 2017), Seligman (2018) clarified that PERMA was intended as an actionable framework for well-being rather than a competing theory of it, positioning its elements as a distinct and measurable building blocks of flourishing. Within the context of this study, the Engagement and

Accomplishment components of PERMA are the most directly relevant to this study, as personal growth encompasses both the deep absorption associated with meaningful activity and the progressive realization of one's capabilities. Positive work attitudes serve as enabling conditions for both, suggesting that they may buffer the suppressive effects of financial insecurity on growth. In this way, COR theory, the JD-R model and PERMA framework are not merely complementary, but collectively integrated provide theoretical basis for the investigation.

However, theoretical frameworks alone do not fully capture the conditions under which financial insecurity is experienced. The institutional and regulatory environment in which individuals are embedded shapes their vulnerability in equal way. Financial insecurity has important legal dimensions that influence individuals' vulnerability and capacity for personal growth. Legal frameworks, including consumer protection lars, debt collection regulations, and bankruptcy provision directly influence how financial distress is experienced and mitigated. Aggressive deb collection practice can heighten feelings of powerlessness and shame, further worsening the psychological resources necessary for growth (Rhodes, 2025). Within the COR Theory, access to legal protection function as a condition resource, meaning that its presence buffers against resource loss, while its absence accelerates loss spirals and further constrains personal development.

Taken together, the psychological, motivational and legal dimensions of financial insecurity reviewed above provide a complex and multifaceted picture. Although many studies exist within the academic research, several gaps remain. Few studies have empirically tested whether work attitudes mediate the financial insecurity – personal growth relationship as a eudaimonic outcome, leaving the motivational pathway proposed by JD-R model largely unexamined in this context. Research also rarely tests the constraint and catalyst hypothesis simultaneously within a single controlled model, and studies examining work attitudes under financial stress tend to prioritize job satisfaction or burnout over the richer developmental dimension captured by Ryff's personal growth construct.

Therefore, this study addresses these gaps by integrating the COR theory, JD-R model and eudaimonic well-being frameworks into a unified empirical model that simultaneously examines direct, mediated, and demographically moderated pathways between financial insecurity and personal growth.

4. Empirical Findings

The analysis was conducted on a diverse sample of N = 69 respondents. Descriptive statistics and regression results are presented below. Table 2 presents the means, standard deviations, minimum, and maximum values for the three main study variables.

Table 2: Descriptive statistic

Variable	Mean	SD	Min	Max
Financial Insecurity	2.208	0.886	1.000	4.667
Attitudes towards Work	3.845	0.996	1.000	5.000
Personal Growth	3.780	0.828	1.000	5.000

Source: Authors' data

As shown in Table 2, respondent reported a moderate level of financial insecurity (M=2.21), suggesting that on average, participants expected relatively low to moderate financial concerns. Attitudes toward work were relatively positive (M=3.85), showing that participants felt engaged, found their work useful, experienced reasonable autonomy, and perceived moderate level of pressure. Personal growth also showed moderately high mean score (M=3.78). This suggest that on average, respondents have reasonably positive levels of autonomy, self-expression, clear thinking, problem solving abilities and social connection. However, the standard deviations show noticeable differences across all three variables. These finding give us base understanding of the sample before continuing with inferential analysis.

Table 3: Summary of OLS Regression Models

Model	Dependent variable	Key predictors	N	R^2	Adj. R^2	F	p
1	Personal growth	Financial insecurity	69	0.143	0.130	9.823	0.003
2	Personal growth	Financial insecurity + controls	69	0.158	0.091	2.040	0.085
3	Financial insecurity	Income	69	0.665	0.660	106.500	<0.001
4	Personal growth	Financial insecurity + attitudes toward work + work controls	69	0.437	0.383	3.789	0.003

Source: Authors' data

Note – Controls in model 2 and model 4 include gender, age, education and income. All models were estimated with HC3 heteroskedasticity – robust standard errors

Table 4: Regression Models predicting personal growth (Models 1, 2, and 4)

Predictor	**Model 1**	**Model 2**	**Model 4**
Intercept	4.559 (0.234)***	5.218 (0.773)***	2.742 (0.978)**
Male	-	-0.019 (0.258)	-0.139 (0.211)
Financial insecurity	-0.353 (0.113)**	-0.475 (0.182)**	-0.248 (0.178)
Attitudes toward work	-	-	0.482 (0.129)***
Age	-	-0.007 (0.147))	0.068 (0.102)
Education	-	-0.059 (0.158)	-0.079 (0.125)
Income	-	-0.076 (0.168)	-0.069 (0.143)

Source: Authors' data

Note – Unstandardized coefficients are reported, with HC3 robust standard errors in parentheses. Model 1 is the baseline model. Model 2 adds demographic controls. Model 4 is the final model including attitudes toward work. Male is coded relative to the reference category female. ** p<0.01, ***<0.001

In the baseline regression model (Model 1) shows a negative association between financial insecurity and personal growth, where financial insecurity has negative and statistically significant relation with personal growth, i.e. b = -0.3531, p = 0.002 (see Table 4). This model explains 14.3% of the variance in the dependent variable (as shown in Table 3), indicating that respondents who reported greater financial insecurity report and lower level of personal growth.

When demographic controls were added, the result remained unchanged, i.e. in Model 2, financial insecurity continued to predict personal growth negatively and significantly, where b = -0.475, p = 0.009 (see Table 4). On the other hand, age, gender, education and income were not statistically significant predictors. Although Model 2 explained more variance, than the previous, i.e. R^2 = 0.158 (see Table 3), the adjusted explanatory power remained modest, indicating that this analysis should be more interpreted as exploratory rather than definitive.

Model 3, that was used as a separate regression model predicting financial insecurity from income has the strongest effect in this research. Higher income was associated with significantly lower financial insecurity, b = -0.6199, p<0.001 (see Table 5), and the model explained 66.5% (as shown in Table 3) of

the variance in financial insecurity. This suggests that income remains a major structural determinant of perceived financial insecurity within the sample.

Table 5: Regression Model predicting financial insecurity (Model 3)

Predictor	**b**	**p**
Intercept	4.005 (0.194)	<0.001
Income	-0.620 (0.060)	<0.001

Source: Authors' data

Note – Unstandardized coefficients are reported, with HC3 robust standard errors in parentheses.

The mediation analysis (Table 6) shows that financial insecurity was negatively associated with attitudes towards work (b = -0473, p = 0.050), while attitudes towards work positively predicted personal growth in the final model 4 (b = 0.482, p<0.001). This shows that once attitudes towards work were included, the direct effect of financial insecurity on personal growth became statistically non-significant, where b = -0.248, and p=0.164, (see Table 4).

The bootstrap indirect effect was -0.224, with a 95% confidence interval from 0.504 to -0.012, indicating statistically significant indirect pathway.

Table 6: Mediation Analysis – Attitudes toward work as an indirect path

Path/Effect	**Coefficient**	**SE**	**p**	**95% CI**
Financial insecurity __> Attitudes toward work (a path)	-0.473	-	0.050	-
Attitudes toward work à Personal growth (b path)	0.482	0.129	<0.001	[0.229, 0.734]
Direct effect of financial insecurity on personal growth (c' path)	-0.248	0.178	0.164	[-0.596, 0.101]
Indirect effect (ab)	-0.224	Bootstrapped	Significant	[-0.5014, -0.012]

Source: Authors' data

Note – The indirect effect was evaluated using a bootstrap confidence interval. Because zero is not included in the 95% confidence interval, the mediated effect is statistically significant.

5. Discussion of Findings

The findings support the conclusion that financial insecurity acts primarily as a constraint on personal growth rather than catalyst. The negative and statistically significant coefficient in the baseline model suggest that greater economic constrain is related with lower optimism, lower clarity and reduced self-development orientation. Financial insecurity seems to undermine the psychological conditions that support growth-oriented actions. The controlled model enhances this interpretation, because even when age, gender, and income were introduced, financial insecurity remained significant. In other words, the results suggest that the subjective experience of insecurity may be more relevant for explaining the personal growth than the demographic characteristics of respondents. The strong negative effect of income on financial insecurity, shows that economic resources still matter indirectly by shaping perceived security. This interpretation is further explained by the mediation analysis. Financial security reduces the positive work attitudes, and these decreased attitudes are associated with lower personal growth.

The indirect pathway, actually, shifts the explanation from purely economical context to a psychological one. Therefore, the financial insecurity constrains the personal development, only through the material line, and by weakening the sense of autonomy, self-expression and positive work engagements that contribute to broader self-development.

At the same, these findings should be interpreted with caution. The size of the sample, 69 is acceptable for exploratory regression analysis and it limits the statistical power, especially for mediation analysis and contrasts across subgroups. Therefore, the results should be analyzed as indicative, and not as a conclusive. However, even in that sense, the study contributes with useful evidence that financial insecurity is not only economic condition, but also and a psychological and developmental one.

6. Conclusion

The present study provides empirical evidence that financial insecurity primarily acts as a constraint rather than a catalyst for personal growth. The significant negative relationship observed in the initial regression model aligns with the COR Theory, which emphasizes how the threat or loss of financial resources triggers loss spirals that deplete core psychological resources such as optimism, cognitive clarity, and problem-solving capacity (Hobfoll, 1989, 2001; Weinstein & Stone, 2018; de Almeida et al., 2024).

These findings become more complex, once the work attitudes are taken into account. By adding this variable to the model, it enhanced its explanatory power and eliminated the previously observed direct effect of financial insecurity, emphasizing the important protective function of favorable work attitudes

that play. This is consistent with the Jon Demands-Resources (JD-R) model, dimensions such as engagement, perceived usefulness, autonomy and manageable pressure appear to act as meaningful counterweights to financial stress (Bakker, Demerouti, 2007, 2017; Bakker et al., 2023).

Financial stress restricts personal growth not only through its immediate impact, but and through the way it weakens how positively individuals engage with their work. This study equally draws attention and to the legal dimensions of financial insecurity, where consumer protection legislation and debt recovery practices can enhance the psychological burden and place further limits on personal development (O'Connor et al., 2019; Pistor, 2013; Rhodes, 2025).

Finally, even though financial insecurity can hinder personal growth, the damage does not have to be irreversible.

References

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. Journal of Managerial Psychology, 22(3), 309–328. https://doi.org/10.1108/02683940710733115

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. Journal of Occupational Health Psychology, 22(3), 273–285. https://doi.org/10.1037/ocp0000056

Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. I. (2023). Job demands–resources theory: Ten years later. Annual Review of Organizational Psychology and Organizational Behavior, 10, 25–53. https://doi.org/10.1146/annurev-orgpsych-120920-053933

Basistha, Banani & Bhuyan, Kangkan. (2025). The PERMA Model in Practice: Exploring Life Satisfaction and Wellbeing. 6. 463-473.

de Almeida, F., Scott, I. J., Soro, J. C., Fernandes, D., Amaral, A. R., Catarino, M. L., Arêde, A., & Ferreira, M. B. (2024). Financial scarcity and cognitive performance: A meta-analysis. Journal of Economic Psychology, 101, Article 102702. https://doi.org/10.1016/j.joep.2024.102702

Fritz, M. S., & Mackinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science, 18*(3), 233–239. https://doi.org/10.1111/j.1467-9280.2007.01882.x

Goodman, F. R., Disabato, D. J., Kashdan, T. B., & Kauffman, S. B. (2017). Measuring well-being: A comparison of subjective well-being and PERMA. The Journal of Positive Psychology, 13(4), 321–332. https://doi.org/10.1080/17439760.2017.1388434

Hayes, A. F., & Cai, L. (2007). Using heteroskedasticity-consistent standard error estimators in OLS regression: An introduction and software implementation. *Behavior Research Methods, 39*(4), 709–722. https://doi.org/10.3758/bf03192961

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. American Psychologist, 44(3), 513–524. https://doi.org/10.1037/0003-066X.44.3.513

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. Applied Psychology, 50(3), 337–421. https://doi.org/10.1111/1464-0597.00062

Infurna, F. J., Luthar, S. S., & Grimm, K. J. (2022). Investigating posttraumatic growth in midlife using an intensive longitudinal research design: Posttraumatic growth is not as prevalent as previously considered. *European Journal of Personality, 36*(4), 576–596. https://doi.org/10.1177/08902070211041852

Long, J. S., & Ervin, L. H. (2000). Using heteroscedasticity consistent standard errors in the linear regression model. *The American Statistician, 54*(3), 217–224. https://doi.org/10.1080/00031305.2000.10474549

Modern Health. (2026, February). Rising financial stress is reshaping workforce well-being. Retrieved from https://www.modernhealth.com/post/rising-financial-stress-is-reshaping-workforce-well-being

O'Connor, G. E., Newmeyer, C. E., Wong, N. Y., & Cook, L. A. (2019). Conceptualizing the multiple dimensions of consumer financial vulnerability. Journal of Business Research, 100, 421–430. https://doi.org/10.1016/j.jbusres.2018.12.033

Paglinawan, J. L., & Orbilla Jr, E. C. (2025). Balancing between work and study: Trials and triumphs of working students at an early age. *International Journal of Research and Innovation in Applied Science, 10*(5), 160–168. https://doi.org/10.51584/IJRIAS.2025.100500015

Patel, P. C. (2020). The impact of financial insecurity on the self-employed's psychological distress. Journal of Business Venturing Insights, 14, e00198. https://doi.org/10.1016/j.jbvi.2020.e00198

Pew Research Center. (2009, September 3). *III. Attitudes toward work*. Pew Research Center. https://www.pewresearch.org/social-trends/2009/09/03/iii-attitudes-toward-work/

Pistor, K. (2013). A legal theory of finance. Journal of Comparative Economics, 41(2), 315–330. https://doi.org/10.1016/j.jce.2013.03.003

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and

comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891. https://doi.org/10.3758/brm.40.3.879

Rasdi, R. M., Zaremohzzabieh, Z., & Ahrari, S. (2021). Financial insecurity during the COVID-19 pandemic: Spillover effects on burnout–disengagement relationships and performance of employees who moonlight. Frontiers in Psychology, 12, Article 610138. https://doi.org/10.3389/fpsyg.2021.610138

Rhodes, A. P. (2025). Debt collection pressure and mental health: Examining the psychological toll of aggressive debt practices. Journal of Health and Social Behavior, 66(1), 45–62. https://doi.org/10.1177/00221465241234567

Rohde, N., Tang, K. K., Osberg, L., & Rao, P. (2018). Economic insecurity: A socioeconomic determinant of mental health. *SSM – Population Health, 6*, 184–194. https://doi.org/10.1016/j.ssmph.2018.09.006

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. Journal of Personality and Social Psychology, 57(6), 1069–1081. https://doi.org/10.1037/0022-3514.57.6.1069

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. Journal of Personality and Social Psychology, 69(4), 719–727. https://doi.org/10.1037/0022-3514.69.4.719

Ryu, S., et al. (2022). The relationship between financial worries and psychological distress among U.S. adults. Social Science & Medicine, 295, Article 114701. https://doi.org/10.1016/j.socscimed.2021.114701

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. Journal of Organizational Behavior, 25(3), 293–315. https://doi.org/10.1002/job.248

Securian Financial. (2023). Relationship between financial and mental health. Retrieved from https://www.securian.com/insights-tools/articles/relationship-between-financial-mental-health.html

Seligman, M. E. P. (2011). Flourish: A visionary new understanding of happiness and well-being. Free Press.

Seligman, M. E. P. (2018). PERMA and the building blocks of well-being. The Journal of Positive Psychology, 13(4), 333–335. https://doi.org/10.1080/17439760.2018.1437466

Springer, K. W., Pudrovska, T., & Hauser, R. M. (2025). Educational disparities in 20-year trajectories

of psychological well-being in a national sample. *Scientific Reports, 15.* https://doi.org/10.1038/s41598-025-95058-y

Tedeschi, R. G., & Calhoun, L. G. (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–471. https://doi.org/10.1002/jts.2490090305

Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry, 15*(1), 1–18. https://doi.org/10.1207/s15327965pli1501_01

Weinstein, N., & Stone, D. N. (2018). Need depriving effects of financial insecurity: Implications for well-being and financial behaviors. Journal of Experimental Psychology: General, 147(10), 1503–1520. https://doi.org/10.1037/xge0000429

Human Dignity in Algorithmic Workplaces: Autonomy, Recognition, and Justice in AI-Mediated Management

Hina Zahoor[11]

The rapid diffusion of algorithmic management systems is transforming how work is organized, monitored, and evaluated. While these systems promise efficiency, objectivity, and scalability, their implications for human dignity remain insufficiently theorized. This article develops a dignity-centered framework explaining how AI-mediated management shapes worker experiences through three interrelated dimensions: autonomy, recognition, and justice. Drawing on research on dignity at work, organizational justice, autonomy, and algorithmic control, the paper identifies three mechanisms through which dignity may be undermined: algorithmic opacity, intensified surveillance, and depersonalized evaluation. Opaque decision processes can weaken procedural justice, continuous monitoring may constrain self-determination, and metric-driven evaluations can diminish social recognition by reducing workers to performance scores.

The framework further proposes that transparency and participatory design processes can mitigate these risks by strengthening trust, enhancing fairness perceptions, and supporting meaningful worker voice. By integrating fragmented literatures into a unified model, the article reframes algorithmic management as a moral and social governance system rather than solely a technological tool. It contributes to management research by specifying mediating mechanisms and boundary conditions that enable empirical testing and by advancing a multilevel perspective linking individual dignity experiences to organizational legitimacy and broader societal concerns about responsible technological governance. The framework offers a foundation for future empirical research and informs the design of algorithmic systems that support dignity while maintaining operational efficiency.

Keywords: human dignity; algorithmic management; workplace autonomy; organizational justice; AI-mediated work

[11] **Dr. Hina Zahoor**, Assistant Professor, Istanbul Gelisim University. Email:hzahoor@gelisim.edu.tr ORCID: 0000-0003-2322-5678

1. Introduction

Algorithmic systems increasingly structure the coordination, evaluation, and control of work across sectors ranging from manufacturing to platform-based services. Digital monitoring tools, predictive analytics, and automated decision systems now guide task allocation, performance evaluation, and disciplinary processes (Kellogg, Valentine, & Christin, 2020; Möhlmann et al., 2021). These developments are often framed as enhancing efficiency, consistency, and scalability, reflecting broader transformations associated with advanced digital technologies (Brynjolfsson & McAfee, 2014; Autor, 2015). Yet the expansion of algorithmic control also raises fundamental questions about the human experience of work.

Work is not solely an economic activity; it is a domain through which individuals experience autonomy, social recognition, fairness, and self-worth. The concept of dignity at work emphasizes the intrinsic value of individuals and the importance of respectful treatment, meaningful participation, and moral worth in organizational life (Hodson, 2001; Bolton, 2007; Pirson, 2017). When managerial systems constrain voice, obscure decision processes, or reduce workers to data points, dignity may be compromised.

Emerging research shows that algorithmic management systems reshape power relations and worker experiences. Algorithmic control can intensify monitoring, create information asymmetries, and limit worker discretion (Rosenblat & Stark, 2016; Wood et al., 2019). Workers often perceive algorithmic decisions as opaque and difficult to contest, affecting trust and fairness perceptions (Lee, 2018). At the same time, automation is frequently justified as a means of reducing bias and improving consistency, revealing a paradox in which technological neutrality may coexist with new forms of inequality or dehumanization (Ajunwa, 2019).

Despite growing scholarship on digital control, algorithmic management, and platform work, research remains fragmented. Studies have examined fairness perceptions (Lee, 2018), algorithmic control (Kellogg et al., 2020), gig work autonomy (Wood et al., 2019), and digital surveillance (Zuboff, 2023), yet these insights have rarely been integrated into a coherent framework centered on human dignity. Moreover, while organizational justice theory highlights fairness in decision processes (Greenberg, 1990; Cropanzano et al., 2007), and self-determination theory emphasizes autonomy as a basic psychological need (Deci & Ryan, 2000), their relevance to AI-mediated workplaces remains underdeveloped.

This article develops a dignity-centered conceptual framework to explain how algorithmic management affects worker experiences through three interrelated mechanisms: autonomy, recognition, and justice. The framework specifies how algorithmic opacity, surveillance intensity, and depersonalized evaluation

shape dignity outcomes and identifies boundary conditions that influence these relationships. By integrating literatures on dignity, justice, autonomy, and algorithmic control, the article contributes a theoretically coherent explanation of dignity in digital workplaces.

2. Theoretical Foundations

2.1 Human Dignity at Work

Human dignity at work refers to the recognition of employees as intrinsically valuable individuals who deserve respect, fairness, and meaningful participation in organizational life (Hodson, 2001; Bolton, 2007). Beyond formal compliance or courteous treatment, dignity reflects whether workers are treated as ends in themselves rather than as instruments for organizational goals.

Humanistic management perspectives position dignity as a central organizational principle, emphasizing that firms have ethical responsibilities toward human flourishing alongside economic performance (Pirson, 2017). From this view, work should enable psychological safety, participation, and meaningful contribution.

Philosophically, dignity is grounded in the Kantian principle that individuals possess intrinsic worth and should not be reduced to tools of production (Kant, 1785/1993). Accordingly, organizational systems that reduce employees to performance metrics or data points risk undermining their moral standing.

Dignity is strengthened when employees experience respectful treatment, voice in decision-making, and fairness in procedures. Conversely, exclusion, humiliation, or arbitrary control erode dignity and can lead to disengagement and withdrawal (Bolton, 2007).

2.2 Autonomy, Recognition, and Justice

Autonomy

Autonomy refers to the experience of volition and self-determination in one's work. Self-determination theory identifies autonomy as a fundamental psychological need that supports motivation and well-being (Deci & Ryan, 2000). In organizational contexts, autonomy is expressed through discretion, decision latitude, and meaningful control over task execution.

Work design research shows that autonomy enhances motivation, performance, and engagement, particularly when employees can shape how work is completed (Grant, 2008; Parker & Grote, 2022). However, structured systems and algorithmic controls can either support or constrain autonomy depending on their design.

Recognition

Recognition refers to the acknowledgment of employees' contributions, identity, and social worth within organizational life. Work is a key site of identity formation, where individuals derive meaning and status through perceived appreciation (Sayer, 2011).

Recognition is not limited to formal rewards but includes respect, feedback, and social validation of effort. When workers are reduced to numerical outputs, their broader contributions—such as collaboration, emotional labor, or ethical judgment—may be overlooked, weakening their sense of worth (Bolton, 2007).

Justice

Organizational justice refers to perceived fairness in outcomes, processes, and interpersonal treatment (Greenberg, 1990; Cropanzano et al., 2007).

- **Distributive justice** concerns fairness of outcomes.
- **Procedural justice** concerns fairness of decision-making processes.
- **Interactional justice** concerns respectful treatment and communication (Bies, 2015).

Justice perceptions are critical for trust and legitimacy. Even unfavorable outcomes are more acceptable when processes are transparent and respectful.

2.3 Algorithmic Management and Control

Algorithmic management refers to the use of data-driven systems to allocate tasks, evaluate performance, and coordinate work with minimal human supervision (Kellogg et al., 2020; Möhlmann et al., 2021). These systems rely on continuous data collection, automated decision rules, and real-time feedback mechanisms.

While algorithmic systems can increase efficiency and consistency, they also introduce new forms of control through:

- opacity of decision-making
- continuous surveillance
- metric-based evaluation

These mechanisms reshape worker experiences of autonomy, recognition, and justice in ways that remain underexplored from a dignity perspective.

3. Integrated Conceptual Framework

3.1 Overview of the Framework

This study proposes a dignity-centered framework explaining how algorithmic management shapes worker experiences through three interrelated mechanisms: **algorithmic opacity, surveillance intensity, and depersonalized evaluation**. These mechanisms affect dignity through three core psychological–social pathways: **autonomy, recognition, and justice**.

Dignity is defined as the extent to which workers experience themselves as autonomous, socially valued, and fairly treated individuals within AI-mediated work systems (Pirson, 2017; Hodson, 2001).

3.2 Mechanisms Linking Algorithmic Management to Dignity

Algorithmic Opacity → Justice → Dignity

When algorithmic systems are opaque, workers cannot understand or contest decisions regarding tasks, pay, or evaluation. This reduces procedural transparency and weakens perceived fairness.

Proposition 1: Algorithmic opacity undermines procedural justice, thereby reducing dignity.

Surveillance Intensity → Autonomy → Dignity

Continuous monitoring through digital tracking and performance dashboards reduces discretion and increases behavioral control. Workers may feel constantly evaluated, limiting self-determination.

Proposition 2: High surveillance intensity reduces perceived autonomy, thereby undermining dignity.

Depersonalized Evaluation → Recognition → Dignity

When performance is reduced to numerical scores or rankings, workers' broader contributions become invisible. This weakens social acknowledgment and identity affirmation.

Proposition 3: Depersonalized algorithmic evaluation weakens recognition, thereby reducing dignity.

3.3 Moderating Mechanisms

Transparency and Participatory Design

Transparency in algorithmic logic and worker participation in system design can mitigate dignity loss by enhancing fairness, voice, and trust.

Proposition 4: Transparency and participatory design reduce the negative effects of algorithmic management on dignity.

3.4 Boundary Conditions

The strength of these relationships depends on contextual factors:

- **Task complexity:** autonomy loss is more damaging in knowledge-intensive work

- **Economic dependence:** dependence increases vulnerability to algorithmic control
- **Institutional protection:** stronger regulation mitigates dignity risks

Proposition 5: Dignity effects are stronger under high economic dependence and weak institutional protections.

3.5 Conceptual Model

The model proposes that:

- Algorithmic management → (Opacity, Surveillance, Depersonalization)
- These mechanisms → (Justice, Autonomy, Recognition)
- These mediators → Dignity outcomes

Moderated by:

- Transparency & participatory design (buffering effect)
- Contextual conditions (economic and institutional environment)

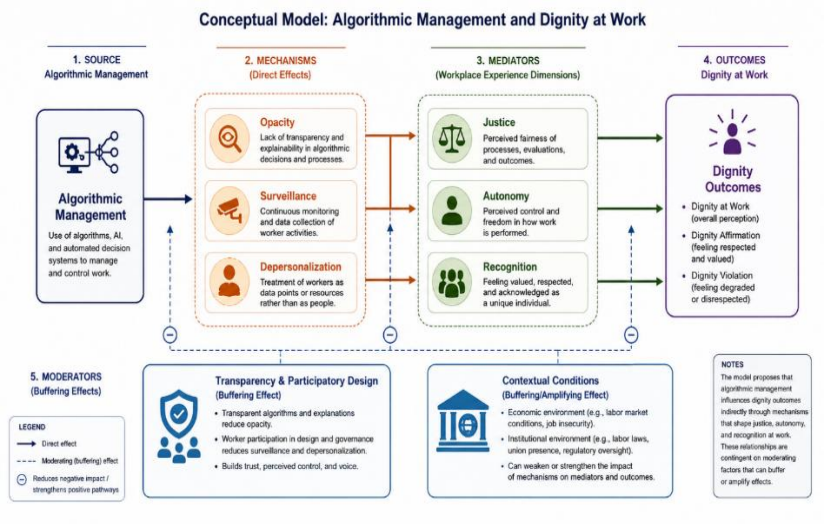


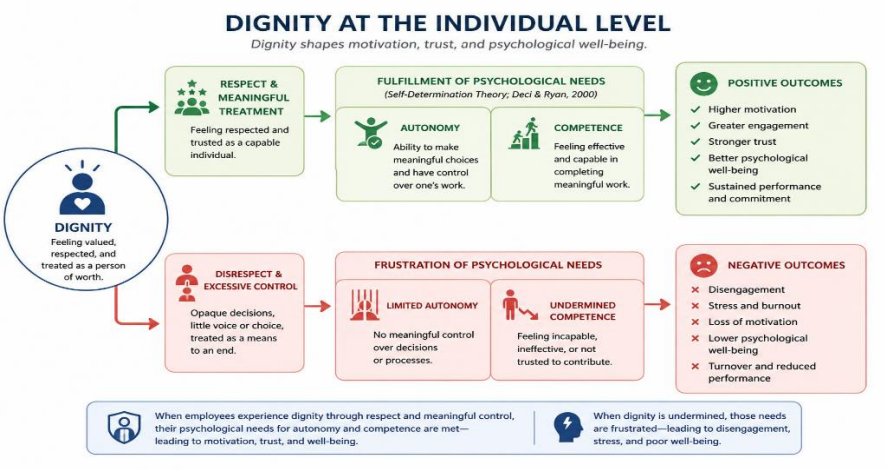
Figure 1. Conceptual Model of Dignity in Algorithmic Workplaces

4. Multilevel Implications

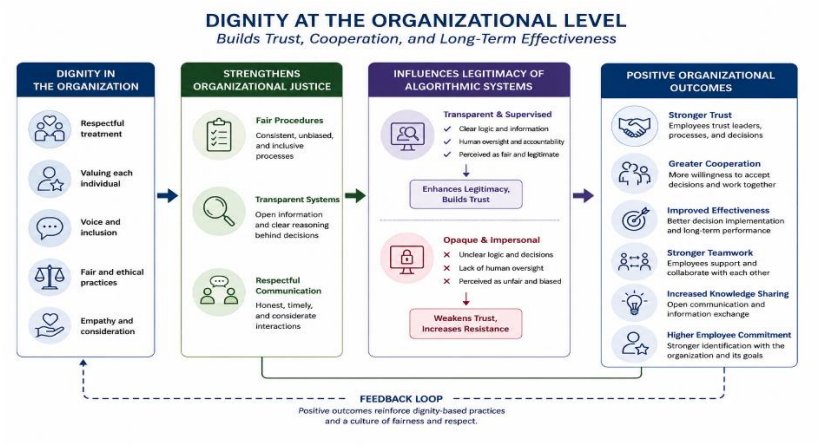
Dignity in algorithmically managed workplaces does not only shape individual experiences; it also influences how organizations function and how societies evolve in response to digital technologies.

Because AI-driven management systems affect autonomy, recognition, and fairness, their impact can be understood across individual, organizational, and societal levels.

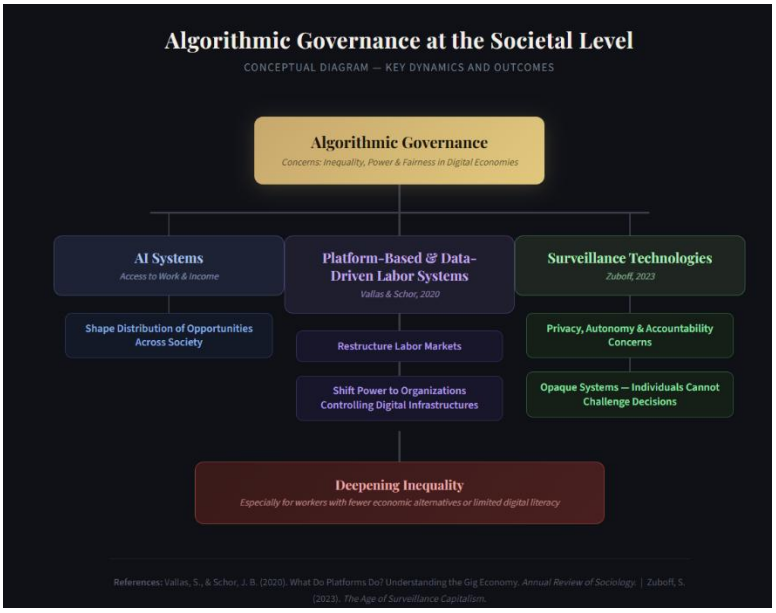
At the **individual level**, dignity is closely tied to motivation, trust, and psychological well-being. When employees feel respected and able to exercise meaningful control over their work, they are more likely to stay motivated and engaged. Self-determination theory explains that autonomy and competence are essential psychological needs that support well-being and effective functioning (Deci & Ryan, 2000). In contrast, when workers experience opaque decision-making, excessive control, or lack of respect, they may become disengaged, stressed, or emotionally exhausted over time.



At the **organizational level**, dignity contributes to trust, cooperation, and long-term effectiveness. Fair procedures, transparent systems, and respectful communication strengthen perceptions of organizational justice, which encourages employees to accept decisions and collaborate more willingly (Cropanzano et al., 2007). When algorithmic systems are transparent and supported by human oversight, they tend to enhance legitimacy. However, when systems are opaque or impersonal, they can weaken trust and increase resistance. Organizations that actively support dignity also benefit from stronger teamwork, knowledge sharing, and employee commitment.



At the **societal level**, algorithmic governance raises broader concerns about inequality, power, and fairness in digital economies. As AI systems increasingly determine access to work and income, they also shape how opportunities are distributed across society. Platform-based and data-driven labor systems have been shown to restructure labor markets and shift power toward organizations that control digital infrastructures (Vallas & Schor, 2020). At the same time, surveillance technologies raise important concerns about privacy, autonomy, and accountability because decisions are often made through opaque systems that individuals cannot easily challenge (Zuboff, 2023). These dynamics may deepen inequality, particularly for workers with fewer economic alternatives or limited digital literacy.



Overall, dignity in algorithmic workplaces should be understood as a multi-level phenomenon. It begins with individual experiences of respect and autonomy, extends to organizational systems of fairness and legitimacy, and ultimately connects to broader societal questions about justice and power in digital

economies. This interconnected perspective highlights the importance of designing AI systems that not only improve efficiency but also protect human dignity across all levels of work life (Cropanzano et al., 2007; Deci & Ryan, 2000; Vallas & Schor, 2020; Zuboff, 2023).

5. Discussion and Future Research

This study highlights a fundamental tension in algorithmically mediated workplaces: while digital systems can significantly improve efficiency, coordination, and scalability, they may also introduce challenges that affect worker dignity. Algorithmic tools are increasingly used to manage tasks, monitor performance, and support decision-making in real time. However, these same systems can generate opacity, continuous surveillance, and standardized evaluation processes that may undermine employees' sense of autonomy, recognition, and fairness. Understanding this dual nature is essential for assessing the human consequences of algorithmic governance and for developing more balanced workplace systems that combine performance with respect for human dignity (Kellogg et al., 2020; Möhlmann et al., 2021).

Future research should first focus on examining how dignity is experienced in different algorithmically managed settings. Much of the current research has centered on platform-based gig work, where issues such as rating systems, algorithmic control, and information asymmetries are highly visible (Rosenblat & Stark, 2016; Wood et al., 2019). However, algorithmic management is now expanding into other sectors such as healthcare, logistics, finance, and public administration. In these contexts, digital systems often interact with professional judgment, ethical responsibility, and service quality. For example, in healthcare settings, algorithmic monitoring may influence clinical decision-making and professional autonomy in complex ways. Comparative studies across sectors can help clarify whether dignity-related challenges differ depending on occupational norms, levels of discretion, and task complexity (Parker & Grote, 2022).

Experimental research designs also offer valuable opportunities to better understand how algorithmic transparency influences fairness perceptions. By manipulating the level and format of explanations provided by algorithmic systems, researchers can examine how individuals respond in terms of perceived procedural justice, trust, and acceptance of decisions. Prior research has shown that transparency and explainability play a key role in shaping fairness judgments in algorithmic environments (Lee, 2018). Building on this, controlled experiments could test how different explanation styles, appeal mechanisms, or human oversight features affect employees' emotional and cognitive responses to algorithmic decisions.

In addition, longitudinal studies are needed to capture how perceptions of dignity evolve over time. Initial acceptance of algorithmic systems may change as employees gain experience, encounter unexpected

decisions, or become more aware of monitoring practices. Over time, repeated exposure to opaque or unfair systems may gradually weaken trust, engagement, and organizational commitment. Longitudinal approaches would allow researchers to explore whether dignity violations accumulate and contribute to long-term outcomes such as burnout or turnover. Since trust develops through repeated interactions and perceptions of fairness, studying these dynamics over time is particularly important (Cropanzano et al., 2007).

Another important direction involves comparative institutional research. The impact of algorithmic management on dignity is likely shaped by national regulations, labor protections, and institutional norms. In environments with strong worker protections and transparency requirements, algorithmic systems may be perceived as more legitimate and fair. In contrast, weaker regulatory contexts may increase vulnerability to surveillance and opaque decision-making practices. Institutional frameworks therefore play a key role in shaping how algorithmic control is experienced by workers (Greenberg, 1990). Cross-national studies could provide valuable insights into how governance structures moderate the relationship between algorithmic management and dignity.

Future research should also explore how work design and participatory approaches can help preserve dignity in AI-driven environments. Work design theory emphasizes the importance of autonomy, task significance, and meaningful engagement for motivation and performance (Grant, 2008; Parker & Grote, 2022). Integrating human-centered AI principles and participatory design approaches may allow employees to retain greater control over their work processes while still benefiting from technological support. Research on worker involvement in system design and evaluation processes could provide important evidence on how to balance efficiency with dignity in algorithmic systems.

Finally, there is a need for more interdisciplinary research that brings together management studies, sociology, human–computer interaction, and ethics. As algorithmic governance continues to expand, issues related to fairness, accountability, power, and surveillance will remain central to debates about the future of work. Understanding dignity in this broader context is essential for developing responsible approaches to technological innovation that align with human values (Vallas & Schor, 2020; Zuboff, 2023).

Overall, this study encourages future research to move beyond a narrow focus on efficiency and productivity and instead examine how algorithmic systems shape human experiences of work. By empirically testing dignity-related outcomes and exploring human-centered design strategies, scholars can

contribute to the development of digital workplaces that are not only effective but also ethically and socially sustainable.

6. Conclusion

As algorithmic systems increasingly shape how work is organized, evaluated, and controlled, questions of dignity become central to understanding the human consequences of digital management. AI-mediated coordination can enhance efficiency and scalability, yet it also restructures power, visibility, and evaluation in ways that directly affect workers' sense of worth, agency, and fairness (Kellogg et al., 2020; Möhlmann et al., 2021). Recognizing these implications is essential for ensuring that technological progress does not come at the expense of fundamental human values.

By integrating autonomy, recognition, and justice within a dignity-centered framework, this article provides a theoretically grounded perspective on the moral and organizational implications of algorithmic management. Autonomy reflects workers' capacity for self-direction and meaningful choice, a core psychological need linked to motivation and well-being (Deci & Ryan, 2000). Recognition captures the social affirmation of workers' contributions and their value within a community (Sayer, 2011). Justice encompasses fairness, transparency, and respectful treatment, all of which shape trust and legitimacy in organizational systems (Greenberg, 1990; Cropanzano et al., 2007). Together, these dimensions offer a comprehensive lens for understanding how AI-mediated management influences the experience of dignity at work.

The framework highlights that dignity is not merely an individual perception but a structural outcome shaped by technological design, organizational practices, and institutional contexts. Opaque decision systems, intensive surveillance, and depersonalized evaluation can undermine dignity, while transparency, participatory design, and human oversight can strengthen trust and fairness (Lee, 2018; Wood et al., 2019). Thus, algorithmic management should be understood as a form of governance that embeds ethical choices within technical infrastructures.

Designing algorithmic systems that respect human dignity is both an ethical obligation and a strategic necessity. Organizations that prioritize fairness, autonomy, and recognition are more likely to sustain employee trust, cooperation, and engagement, which are essential for long-term effectiveness (Pirson, 2017; Cropanzano et al., 2007). At a broader level, responsible technological governance is critical for addressing societal concerns about inequality, surveillance, and power in data-driven economies (Vallas & Schor, 2020; Zuboff, 2023).

In the digital age, the future of work will be shaped not only by technological capability but also by the values embedded in its design and implementation. A dignity-centered approach provides a normative and analytical foundation for ensuring that AI-mediated workplaces promote meaningful work, organizational legitimacy, and socially responsible innovation.

References (APA 7th Edition)

Ajunwa, I. (2019). The paradox of automation as anti-bias intervention. *Cardozo L. Rev.*, *41*, 1671.

Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of economic perspectives*, *29*(3), 3-30.

Bies, R. J. (2015). Interactional justice: Looking backward, looking forward. The Oxford handbook of justice in the workplace, 1, 89-107

Bolton, S. (Ed.). (2007). *Dimensions of dignity at work*. Routledge.

Brynjolfsson, E., & McAfee, A. (2014). The second machine age: Work progress and prosperity in a time of brilliant technologies. WW Norton & company.

Cropanzano, R., Bowen, D. E., & Gilliland, S. W. (2007). The management of organizational justice. *Academy of management perspectives*, *21*(4), 34-48.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry*, *11*(4), 227-268.

Folger, R. G., & Cropanzano, R. (1998). Organizational justice and human resource management. sage publications.

Campbell, J. L. (2018). 2017 decade award invited article reflections on the 2017 decade award: Corporate social responsibility and the financial crisis. Academy of Management Review, 43(4), 546-556.

Grant, A. M. (2008). The significance of task significance: Job performance effects, relational mechanisms, and boundary conditions. *Journal of applied psychology*, *93*(1), 108.

Greenberg, J. (1990). Organizational justice: Yesterday, today, and tomorrow. Journal of management, 16(2), 399-432.

Hodson, R. (2001). *Dignity at work*. Cambridge University Press.

Guo, D., Zhong, R. Y., Lin, P., Lyu, Z., Rong, Y., & Huang, G. Q. (2020). Digital twin-enabled Graduation Intelligent Manufacturing System for fixed-position assembly islands. Robotics and

Computer-Integrated Manufacturing, 63, 101917.Kant, I. (1993). *Groundwork of the metaphysics of morals* (M. Gregor, Trans.). Hackett. (Original work published 1785)

Kellogg, K. C., Valentine, M. A., & Christin, A. (2020). Algorithms at work: The new contested terrain of control. Academy of management annals, 14(1), 366-410.

Chong, L., Zhang, G., Goucher-Lambert, K., Kotovsky, K., & Cagan, J. (2022). Human confidence in artificial intelligence and in themselves: The evolution and impact of confidence on adoption of AI advice. *Computers in Human Behavior*, *127*, 107018.

Lee, M. K. (2018). Understanding perception of algorithmic decisions: Fairness, trust, and emotion in response to algorithmic management. Big data & society, 5(1), 2053951718756684.

Lee, M. K., Kusbit, D., Metsky, E., & Dabbish, L. (2015, April). Working with machines: The impact of algorithmic and data-driven management on human workers. In Proceedings of the 33rd annual ACM conference on human factors in computing systems (pp. 1603-1612).

Longoni, C., Bonezzi, A., & Morewedge, C. K. (2019). Resistance to medical artificial intelligence. Journal of consumer research, 46(4), 629-650.

Caldwell, N. D., Roehrich, J. K., & George, G. (2017). Social value creation and relational coordination in public-private collaborations. *Journal of management studies*, *54*(6), 906-928.

Möhlmann, M., Zalmanson, L., Henfridsson, O., & Gregory, R. W. (2021). Algorithmic management of work on online labor platforms: When matching meets control. *MIS quarterly*, *45*(4), 1999-2022.

O'neill, O. (2002). *Autonomy and trust in bioethics*. Cambridge University Press.

Parker, S. K., & Grote, G. (2022). Automation, algorithms, and beyond: Why work design matters more than ever in a digital world. Applied psychology, 71(4), 1171-1204.

Pirson, M. (2017). *Humanistic management: Protecting dignity and promoting well-being*. Cambridge University Press.

Rosenblat, A., & Stark, L. (2016). Algorithmic labor and information asymmetries: A case study of Uber's drivers. *International journal of communication*, *10*, 27-27.

Sayer, A. (2011). *Why things matter to people: Social science, values and ethical life*. Cambridge University Press.

Vallas, S., & Schor, J. B. (2020). What do platforms do? Understanding the gig economy. *Annual review of sociology*, *46*(1), 273-294.

Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019). Good gig, bad gig: autonomy and algorithmic control in the global gig economy. Work, employment and society, 33(1), 56-75.

Zuboff, S. (2023). The age of surveillance capitalism. In *Social theory re-wired* (pp. 203-213). Routledge.

The Impact of Macroeconomic Factors on Stock Prices in the US Economy: ARDL Bounds Test and Toda-Yamamoto Causality Analysis

İrem KARAKURT[12], Hakan EYGU[13]

Abstract

The aim of this study is to empirically examine the effects of core macroeconomic factors on the stock market in the US economy. Utilizing annual data covering the 2009-2024 period, inflation (INF), benchmark interest rate (INT), and unemployment rate (UNEMP) were included in the model as independent variables, while the natural logarithm of the S&P 500 index (LNSP500) was employed as the dependent variable. The long-term cointegration relationship among the variables was analyzed using the ARDL Bounds Test, whereas the dynamic causal relationships were investigated via the Toda-Yamamoto approach. The ARDL bounds test results revealed that there is no long-term cointegration relationship among the variables within the investigated period. This situation is explained by the quantitative easing policies implemented after the 2008 crisis and global shocks that rendered the cointegration bond between financial markets and the real economy asymmetric. On the other hand, the empirical findings of the Toda-Yamamoto causality analysis proved the existence of a strong bidirectional causal relationship between inflation and the S&P 500 index at the 5% significance level (Stock Market ↔ Inflation). Furthermore, unidirectional significant causal links running from the unemployment rate to both the stock market index and inflation were detected. The interest rate variable, however, exhibited a completely external character in the model. The findings obtained offer important empirical implications for macroeconomic policymakers and financial market actors.

Keywords: S&P 500, Inflation, Unemployment Rate, ARDL Bounds Test, Toda-Yamamoto Causality

JEL Codes: E44, G12, C32

1. Introduction

The interaction between financial markets and real macroeconomic indicators constitutes one of the most dynamic areas of debate in modern macroeconomics and finance literature. While stock markets are regarded as a barometer of economic growth, corporate profitability, and investor sentiment, fundamental macroeconomic variables such as inflation, interest rates, and unemployment are the primary sources of

[12] Master's degree candidate, Atatürk University, Institute of Social Sciences, iremkarakurt1@gmail.com 0009-0006-5693-631X

[13] Prof. Dr. Hakan EYGU, Atatürk University, Faculty of Economics and Administrative Sciences, Department of Econometrics, hakaneygü@atauni.edu.tr, 535 594 5035, ORCID No: 0000-0002-4104-2363

systematic risk that shape the pricing behavior of these markets. Particularly in the economy of the United States (US), which hosts the world's largest financial ecosystem, the impact of macroeconomic shocks on stock valuations is of critical importance for both domestic and global financial stability.

The aim of this study is to analyze, within a comprehensive econometric framework, the direct, long-term, and dynamic effects of inflation (INF), the benchmark interest rate (INT), and the unemployment rate (UNEMP) on stock prices (S&P 500 index) using annual data covering the 2009-2024 period in the US economy. Theoretical frameworks found in the literature that explain the relationship between financial assets and macroeconomic fundamentals — namely the Fisher Hypothesis, the Wealth Effect, and the Phillips Curve — constitute the theoretical underpinning of this study. Rather than relying on conventional cointegration methods, the study employs the ARDL Bounds Test and the Toda-Yamamoto causality methodology, which are insensitive to the order of integration of the series and allow for the simultaneous examination of dynamic relationships.

The 2009-2024 period represents a uniquely distinct conjuncture, as it encompasses the unconventional monetary policies implemented following the 2008 Global Financial Crisis (quantitative easing — QE), zero-interest-rate policies (ZIRP), and the supply-demand shocks caused by the COVID-19 pandemic in 2020. In this context, the findings of the study aim to contribute to a better understanding of the asymmetric linkages and transmission mechanisms between the real economy and financial markets, thereby providing guidance to policymakers and portfolio managers.

2. Literature

The empirical literature examining the effects of macroeconomic indicators on stock markets spans a broad spectrum. In conventional finance theory, starting from the assumption that stock prices equal the present value of expected future cash flows, it is anticipated that macroeconomic variables will directly affect these cash flows and discount rates. In this context, Bernanke and Kuttner (2005), who investigated the effects of monetary policy on the stock market, emphasized that unexpected changes in interest rates strongly affect stock prices primarily through expected future dividends and equity risk premiums.

When the literature is reviewed, two main perspectives emerge regarding the relationship between inflation and stock markets. The hypothesis put forward by Fisher (1930), which argues that equities serve as a hedging instrument against inflation, posits that general increases in the price level will positively affect stock prices by raising the nominal asset values and revenues of firms. In contrast, Fama (1981) identified a negative relationship between inflation and stock returns within the framework of the proxy hypothesis. Geske and Roll (1983) extended this relationship further, proposing a reverse causality mechanism (the reverse proxy hypothesis) by arguing that declines in stock returns signal a slowdown in future economic activity, which in turn reduces tax revenues, leads to budget deficits, and consequently

increases the money supply (i.e., inflation).

The relationship between the unemployment rate and financial markets is generally treated as a reflection of overall economic activity and business cycles. Okun's Law and Phillips Curve theories show that changes in the unemployment rate will shape corporate profitability through aggregate demand, output volume, and inflationary pressures. Boyd et al. (2005) demonstrated that the impact of unemployment announcements on stock markets exhibits asymmetric variations depending on the economic conjuncture (periods of growth or recession). Similarly, Flannery and Protopapadakis (2002), in their study testing macroeconomic risk factors in a multiple model, proved that employment and inflation shocks are unquestionably the most powerful risk factors affecting aggregate stock market returns. Interest rates, as the primary instrument of monetary policy, function as a direct discount mechanism on stock market indices by determining both corporate borrowing costs and the attractiveness of alternative investment instruments (bonds, treasury bills, etc.).

Recent empirical studies (Chowdhury et al., 2019; Nasir et al., 2021; Haider et al., 2023) have frequently examined time-series dynamics in developed and emerging markets. Studies such as Maysami et al. (2004) have revealed the existence of long- and short-run relationships between variables such as interest rates, inflation, and employment and stock market indices using time-series methods; these cointegration- and causality-based studies indicate that structural breaks and periods of unconventional monetary policy can disrupt the stability of macro-financial linkages. In particular, following the 2008 crisis, Gagnon et al. (2011) detailed that the Federal Reserve's large-scale asset purchase programs (Quantitative Easing) suppressed long-term interest rates while channeling liquidity into equities, rendering the conventional real-economy-finance equilibrium asymmetric. This study contributes to the existing literature by examining the last 15 years of crisis and recovery in the US economy in light of methodological advances in the modern literature.

3. Method

3.1. Model and dataset

In the empirical analysis phase of the study, annual observations covering the 2009-2024 period for the US economy were used. Year-end closing values of the S&P 500 index were employed as the dependent variable to represent the performance of financial markets and the level of stock prices. As independent variables, consumer price inflation, the benchmark interest rate, and the unemployment rate — which constitute the fundamental pillars of the macroeconomic structure — were selected. The technical details, abbreviations, and data sources of the variables used in the analysis are summarized in Table 1.

Table 1. Dataset and Descriptions

Variables	Symbols	Description	Data Source
Stock Prices	LNSP500	Natural logarithm of the year-end closing values of the S&P 500 index	Yahoo Finance / Investing.com
Inflation	ENF	Consumer price inflation (annual %)	World Bank
Interest Rate	FAIZ	US benchmark interest rate (annual %)	Investing.com
Unemployment Rate	ISSIZ	Unemployment rate as a share of total labor force (%)	World Bank

Since the stock market index is a large-scale, high-variance series, its natural logarithm was taken in order to obtain a linear structure and to allow for more flexible interpretation of the coefficients. The inflation, interest rate, and unemployment variables, expressed as percentages (%), were included in the model in their level forms. The semi-logarithmic (Log-Lin) econometric model established accordingly is presented in Equation (1):

$$lnSP500_t = \beta_0 + \beta_1 * ENF_t + \beta_2 * FAIZ_t + \beta_3 * ISSIZ_t + u_t \quad (1)$$

Burada β_0 sabit terimi; β_1, β_2, β_3 represent the coefficients of the respective independent variables; and u_t denotes the error term.

3.2. An Examination of Stagnation

In order to prevent spurious regression in time-series analysis and to ensure the statistical reliability of the estimates, the stationarity orders of the series must first be determined. For this purpose, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were applied. Models with a constant (C), with a constant and trend (CT), and without a constant or trend (NCT) were tested separately. The unit root analysis results are presented in Table 2.

Table 2. Unit Root Analysis Results

Variables	Model	ADF Level	ADF 1st Diff. (Δ)	PP Level	PP 1st Diff. (Δ)
LNSP500	C	-0,271 (0,903)	-4,725 (0,003)	0,781 (0,989)	-10,942 (0,000)
	CT	-3,388 (0,096)	-4,428 (0,022)	-7,279 (0,000)	-10,853 (0,000)
	NCT	4,246 (0,999)	-0,459 (0,492)	12,784 (0,999)	-2,892 (0,007)
ENF	C	-2,324 (0,177)	-4,907 (0,002)	-2,348 (0,171)	-4,967 (0,002)
	CT	-3,354 (0,098)	-2,942 (0,186)	-2,293 (0,412)	-4,490 (0,016)
	NCT	0,985 (0,904)	-4,794 (0,000)	-0,889	-5,031 (0,000)

				(0,314)	
FAIZ	C	-1,710 (0,407)	-3,198 (0,042)	-1,710 (0,407)	-3,175 (0,044)
	CT	-1,711 (0,695)	-3,591 (0,068)	-1,661 (0,718)	-5,572 (0,003)
	NCT	-0,337 (0,546)	-3,312 (0,003)	-0,331 (0,549)	-3,302 (0,003)
ISSIZ	C	-1,662 (0,429)	-4,287 (0,006)	-1,475 (0,518)	-5,412 (0,001)
	CT	-2,308 (0,405)	-4,215 (0,025)	-2,254 (0,430)	-7,879 (0,000)
	NCT	-1,404 (0,143)	-4,111 (0,001)	-2,434 (0,019)	-4,186 (0,000)

Note: Values in parentheses represent MacKinnon probability (p) values. C: Constant, CT: Constant and Trend, NCT: No Constant and No Trend model specifications.

($p > 0.05$), indicating that they contain a unit root (i.e., are non-stationary). However, when the first differences of the series were taken, the test statistics exceeded the critical values and the p-values fell below the 5% significance threshold. As a result, all macroeconomic series included in the analysis were found to become stationary at their first differences, integrated of order I(1). The fact that all variables are I(1) provides an econometrically suitable basis for the application of ARDL modeling and the bounds test approach.

3.3. ARDL Bounds Test

In order to test for the existence of a cointegration (long-run equilibrium) relationship among the variables, the ARDL (Autoregressive Distributed Lag) Bounds Test approach developed by Pesaran et al. (2001) was employed. The Akaike Information Criterion (AIC) was used to determine the appropriate lag length; considering the limited structure of the dataset (N=15), the maximum lag length was set to 1. According to the AIC results, the most optimal model structure was identified as ARDL (1, 0, 0, 0). The bounds test results applied to this model are presented in Table 3.

Table 3. ARDL Bounds Test Results

Significance Level	Lower Bound I(0)	Upper Bound I(1)
% 10	2,37	3,20
% 5	2,79	3,67
% 1	3,65	4,66

Note: Calculated F-statistic: 2.376. The null hypothesis H0 is stated as: 'There is no cointegration relationship among the series.'

The F-statistic calculated from the bounds test was found to be 2.376. This value falls below even the lower bound value of 2.79 at the 5% significance level. According to the econometric decision rule, when the calculated F-statistic remains below the lower bound, the null hypothesis H0 stating that "there is no long-run cointegration relationship among the series" cannot be rejected. This finding reveals that there is no common long-run deterministic trend or equilibrium between the S&P 500 index and the inflation,

interest rate, and unemployment variables throughout the 2009-2024 period under examination.

3.4. Model Assumptions

A series of diagnostic tests were applied in order to verify the statistical validity, parameter reliability, and BLUE (Best Linear Unbiased Estimator) properties of the estimated ARDL (1, 0, 0, 0) model. Within this scope, autocorrelation, heteroscedasticity, normality, and model specification errors were tested. The diagnostic test outputs are presented in Table 4.

Table 4. Model Diagnostic Test Results

Test Type	Test Method	Test Statistic (F / JB)	P-Value
Autocorrelation Test	Breusch-Godfrey LM	3,791	0,083
Heteroscedasticity Test	Breusch-Pagan-Godfrey	1,019	0,442
Normality Test	Jarque-Bera	0,719	0,698
Model Specification Test	Ramsey RESET	0,797	0,395

According to the diagnostic test results, the Jarque-Bera test p-value (0.698 > 0.05) confirms that the error terms are normally distributed. The Breusch-Godfrey LM test confirmed the absence of autocorrelation (p=0.083 > 0.05), and the Breusch-Pagan-Godfrey test confirmed that the model does not suffer from heteroscedasticity (p=0.442 > 0.05). Finally, the Ramsey RESET test showed that the functional form was correctly specified and contains no specification error (p=0.395 > 0.05). The satisfaction of all fundamental assumptions confirms that the inferences to be drawn from the model outputs are econometrically valid.

3.5. Toda-Yamamoto Causality Analysis

The absence of a cointegration relationship among the series does not imply that short-run dynamic causal linkages between the variables cannot exist. The approach developed by Toda and Yamamoto (1995) produces reliable causality results based on the Wald test applied to a levels VAR (Vector Autoregressive) model, regardless of the integration order of the series. In the model, the optimal lag length was set to k=1 and the maximum integration order of the series was set to d_max=1, yielding a VAR model with a total of 2 lags (k + d_max = 2). The causality matrix based on the Wald test is presented in Table 5.

Table 5. Toda-Yamamoto Causality Results (k+dmax=2)

Dependent Variable	Independent Variable	Chi-Square (Chi-sq)	df	P-value	Decision (Direction of Causality)
LNSP500	ENF	10,746	2	**0,004**	Inflation → SP500 (*)
	FAIZ	3,441	2	0,178	No Causality
	ISSIZ	8,875	2	**0,011**	Unemployment → SP500 (*)
ENF	LNSP500	11,968	2	**0,002**	SP500 → Inflation (*)
	FAIZ	0,170	2	0,918	No Causality
	ISSIZ	6,845	2	**0,032**	Unemployment → Inflation (*)
FAIZ	LNSP500	2,422	2	0,297	No Causality
	ENF	2,122	2	0,345	No Causality
	ISSIZ	3,251	2	0,196	No Causality
ISSIZ	LNSP500	2,345	2	0,309	No Causality
	ENF	1,356	2	0,507	No Causality
	FAIZ	0,786	2	0,674	No Causality

Note: (*) denotes statistically significant causality relationships at the 5% significance level.

The Toda-Yamamoto test outputs present important empirical findings on macro-financial interaction: (1) A strong bidirectional feedback causality relationship was identified between inflation and the S&P 500 index at the 5% significance level. (2) Unidirectional significant causal linkages were detected running from the unemployment rate to both the stock market index and inflation. (3) The interest rate variable had no causal effect on any variable in the system and remained entirely exogenous within the model.

Conclusion

This study empirically examined the effects of inflation, the interest rate, and the unemployment rate on the S&P 500 index using annual data covering the 2009-2024 period in the US economy, employing the ARDL bounds test and the Toda-Yamamoto causality analysis. The findings obtained have yielded not only evidence supporting conventional economic theories, but also original results reflecting the unique financial and conjunctural dynamics of the period under examination.

The failure to identify a long-run cointegration relationship as a result of the ARDL bounds test confirms the periodic asymmetry between stock market indices and real macroeconomic variables, as well as the phenomenon of "financial decoupling." Financial markets tend to price forward-looking speculative expectations, short-term shocks, and risk premiums instantaneously rather than responding to macroeconomic fundamentals. In particular, the massive waves of quantitative easing (QE) initiated by the Federal Reserve (Fed) following the 2008 Global Financial Crisis (Quantitative Easing) and the intensive liquidity injected into markets during the 2020 COVID-19 pandemic led stock market indices to

exhibit an asymmetric upward pricing behavior independent of real economic indicators. This constitutes the primary theoretical justification for the statistical inability to establish a long-run equilibrium linkage.

The most striking finding of the study — the bidirectional causality between inflation and the S&P 500 index — points to the existence of two powerful economic mechanisms. The causal link running from inflation to the stock market is consistent with the Fisher Hypothesis; since equities represent real assets, they are demanded by investors as a "hedging" instrument to preserve purchasing power during inflationary periods, thus driving up stock market valuations. Conversely, the causal link running from the S&P 500 index to inflation empirically confirms the "Wealth Effect" theory. Households and institutional actors whose financial wealth increases with stock market gains raise their consumption and investment expenditures, thereby generating demand-side inflationary pressures through the aggregate demand channel.

The unidirectional causal relationships detected from the unemployment rate to the stock market and inflation confirm the status of the labor market as a leading indicator. Fluctuations in employment transmit powerful signals to the market regarding future production capacity, household disposable income, and corporate profitability, and are immediately priced in by the stock market. The channel running from unemployment to inflation further confirms that the Phillips Curve remains operative in the modern era. Contrary to conventional theory, the absence of significant causality from interest rates to the stock market can be explained by the "Zero Interest Rate Policy" (ZIRP) applied for much of the period under examination, and by the fact that interest rate decisions had already been priced in by the market well in advance, thus not manifesting as causality in the annual data.

In conclusion, the US stock market is not independent of macroeconomic dynamics, particularly employment and inflation shocks. Policymakers must closely monitor the wealth effect cycle between the stock market and inflation, as well as the leading signals of the labor market, in order to ensure financial stability. In future studies, the use of higher-frequency data or the incorporation of panel data approaches with structural breaks into the model may contribute to unraveling the hidden mechanisms of macro-financial transmission.

REFERENCES

Bernanke, B. S., & Kuttner, K. N. (2005). What explains the stock market's reaction to Federal Reserve policy? The Journal of Finance, 60(3), 1221-1257.

Boyd, J. H., Hu, J., & Jagannathan, R. (2005). The stock market's reaction to unemployment news: Why bad news can be good news. The Journal of Finance, 60(2), 649-672.

Chowdhury, A. H. M. Y., Hamid, M. K., & Akhi, R. A. (2019). Impact of macroeconomic variables on economic growth: Bangladesh perspective. Information Management and Computer Science, 2(2), 19-22

Fama, E. F. (1981). Stock returns, real activity, inflation, and money. The American Economic Review,

71(4), 545-565.

Fisher, I. (1930). The Theory of Interest. New York: Macmillan.

Flannery, M. J., & Protopapadakis, A. A. (2002). Macroeconomic factors do influence aggregate stock returns. The Review of Financial Studies, 15(3), 751-782.

Gagnon, J., Raskin, M., Remache, J., & Sack, B. (2011). The financial market effects of the Federal Reserve's large-scale asset purchases. International Journal of Central Banking, 7(1), 3-43.

Geske, R., & Roll, R. (1983). The fiscal and monetary linkage between stock returns and inflation. The Journal of Finance, 38(1), 1-33.

Haider, A., Jabeen, S., Rankaduwa, W., & Shaheen, F. (2023). The nexus between employment and economic growth: A cross-country analysis. Sustainability, 15(15), 11955.

Maysami, R. C., Howe, L. C., & Hamzah, M. A. (2004). Relationship between macroeconomic variables and stock market indices: Cointegration evidence from stock exchange of Singapore's all-S sector indices. Jurnal Pengurusan, 24, 47-77.

Nasir, M. S., Wibowo, A. R., & Yansyah, D. (2021). The determinants of economic growth: Empirical study of 10 Asia-Pacific countries. Signifikan: Jurnal Ilmu Ekonomi, 10(1), 149-160.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. Journal of Econometrics, 66(1-2), 225-250.

Leisure Time Patterns and Management Among University Students: Challenges and Opportunities for Innovative Teaching and Wellbeing Support

Igballe Miftari-Fetishi[14], Ekrem Destanov[15], Fatime Ziberi[16], Sonaj Bilal[17],

Abstract

University students frequently struggle with academic pressure, limited free time, and suboptimal leisure management, which collectively undermine psychological well-being and resilience (Au et al., 2023; Terzi, 2024). This paper investigates how innovative teaching practices and student support programs can create a positive pathway toward effective leisure time management. Drawing on a pilot survey of 106 students at International Balkan University (IBU) and program evaluation data from the university's Student Wellbeing Center (SWC) during the 2024/25 academic year (serving 5,749 students), the study reveals moderate daily free time availability (M = 2.58 hours) dominated by social media (63.2%) and socializing (57.5%), with clear age-related differences in activity patterns. In contrast, the SWC's SEL-guided innovative activities — including Art Therapy workshops, Spring Fest, Psychological First Aid training, cultural events, and recreational spaces — engaged 60.9–69.6% of students, achieved a 71.4% satisfaction rate, and showed year-on-year growth in participation and counseling uptake.

On the other hand, evidence-based innovative teaching strategies have proven highly effective in higher education. In particular, these methods actively engage students in both curricular and extracurricular activities. By fostering greater participation, they not only improve learning outcomes but also support the development of socio-emotional skills, resilience, and more balanced leisure time management. In this regard, the findings of Ziberi (2025) in the volume edited by Kurt (2025) demonstrate that embedding socioemotional learning into experiential and student-centered practices strengthens self-management and relationship skills, builds resilience, and promotes more intentional, restorative use of leisure time.

Practical recommendations include embedding SEL in curricula, scaling wellbeing centers with leisure-planning components, and using innovative events to model balanced lifestyles. This integrated approach offers a scalable model for promoting student flourishing in higher education.

Keywords: leisure time management, university students, innovative teaching, wellbeing, SEL
JEL Codes: I21, I23, I31

[14] Assoc. Prof. Dr. English Language Teaching, Faculty of Education, International Balkan University, Skopje, NRM, i.miftari@ibu.edu.mk
[15] Asst. Prof. Dr, Turkish Language Teaching, Faculty of Education, International Balkan University, Skopje, NRM, ekrem.destanov@ibu.edu.mk
[16] PhD Candidate, Psychological Counseling and Guidance, Faculty of Education, International Balkan University, Skopje, NRM, f.ziberi@ibu.edu.mk
[17] **PhD Candidate,** Psychological Counseling and Guidance, Faculty of Education, International Balkan University, Skopje, NRM, sonaj.bilal@ibu.edu.mk

I. Introduction

Contemporary university students face intense academic demands, transitional stressors, and mental health concerns that often result in poor work-life balance and ineffective use of leisure time (Au et al., 2023; El Hadad, 2024). Many students report limited daily free time, frequently spent on passive activities such as social media, which contributes to heightened stress, reduced resilience, and diminished overall well-being (Terzi, 2024; Zhang et al., 2017). Socioemotional Learning (SEL), operationalized through the CASEL framework's five core competencies — self-awareness, self-management, social awareness, relationship skills, and responsible decision-making — equips students with essential skills for emotional regulation, relationship building, and goal-directed behavior (CASEL, 2020; Wang, 2025). Although SEL is well-established in K-12 education, its deliberate integration into higher education teaching practices and support services remains emerging but highly promising (Conley, 2024; Severino, 2026).

Innovative teaching methods, such as experiential learning, art-based workshops, reflective practices, collaborative projects, and mindfulness-integrated activities, provide fertile ground for embedding SEL (Elmi, 2020). When implemented through dedicated wellbeing centers, these approaches can activate a developmental pathway: SEL-enhanced innovative practices → improved leisure time management.

This paper examines this pathway using mixed data from the International Balkan University (IBU). A pilot leisure time survey identifies baseline challenges, while SWC program metrics demonstrate the impact of real-world SEL-infused innovations. This paper investigates how innovative teaching practices and student support programs can create a positive pathway toward effective leisure time management among university students.

The study addresses the following research questions:

1. What are the current patterns of leisure time availability and usage among IBU university students, including age-related differences?
2. How do SEL-guided innovative activities through the Student Wellbeing Center influence student engagement, satisfaction, and wellbeing indicators?
3. In what ways can enhanced SEL competencies mediate improvements in intentional leisure time management?

Literature Review

1. Socioemotional Learning in Higher Education

The CASEL framework emphasizes that SEL competencies can be explicitly taught and practiced through safe, supportive environments and active learning strategies (CASEL, 2020). In higher education, SEL integration has been associated with reduced anxiety, improved emotional regulation, stronger relationships, and better academic adjustment (Conley, 2024; Severino, 2026; Wang, 2025).

Innovative pedagogies — including project-based learning, art therapy, experiential events, and reflective journaling — naturally cultivate SEL skills (Elmi, 2020; Hareli, 2025). These methods move beyond traditional lectures to foster active engagement, emotional awareness, and social connection.

In line with global trends, International Balkan University has actively promoted innovative teaching practices. Namely, evidence strongly supports the effectiveness of innovative teaching methods. Ziberi (2025), in the volume edited by Kurt (2025), provides detailed explanations and empirical evidence demonstrating that practices such as **project-based learning (PBL), role-play with emotional engagement, personalized learning, and peer evaluation with reflective practice** significantly enhance student engagement, motivation, and learning outcomes. For instance, PBL encourages active participation and real-world problem-solving, leading to deeper understanding and reduced stress compared to traditional lecture-based instruction. Role-play combined with emotional tools (e.g., the "emotional cup" technique) helps students overcome initial resistance, build empathy, and develop socio-emotional competencies. Personalized learning adapts to individual needs and interests, fostering autonomy and self-regulation, while peer evaluation and reflective practice promote critical thinking and self-awareness. These methods shift the focus from passive knowledge transmission to active, student-centered experiences that align closely with SEL competencies. The findings from Ziberi (2025) directly complement the SWC's innovative programs and the pilot survey results, showing how such practices can help students move from excessive social media use toward more balanced, restorative, and purposeful leisure time management.

These findings align with broader research showing that innovative pedagogies foster SEL competencies and contribute to improved psychological well-being and resilience (Elmi, 2020; Conley, 2024). The Student Wellbeing Center's programs (e.g., Art Therapy workshops and Spring Fest) build directly on this foundation by embedding SEL elements into experiential and inclusive activities.

2. Leisure Time: Concept, Evolution, and Functions

Inadequate time management, as well as the pressure from exams and tasks, is often so challenging for students that it is thought that leisure time takes a second place. However, numerous studies tell us about the development of healthier properties and habits in the management of free time. Considering the

demands of the students and the flat study schedules, the students are also faced with the passage and inadequate management of free time, and all this affects the academic performance and success, but also an indicator for the well-being and quality of life of the students.

The management of students' leisure time recently draw the attention of many educational and psychologist researchers and scholars emphasizing its importance. Many studies and literature reviews in talking about leisure time, are mostly focused toward teenagers and younger students, but as contemporary studies suggest it should be emphasized that this is a topic that university students as well should not be excluded, bearing in mind the above reasons.

Through literature we may see that the interest for leisure time management dates from early years and it has evaluated. On this regard as Zarotis and Tokarski (2020), explaining the concept of leisure time and its evaluation, on their review states that leisure time has changed and evaluated through time. As they explain while during 1950s up to 70s, it was considerate as time for rest and consumption, today is considered as time dedicated to experience and enjoyment.

Thus, as they state today's leisure time is the domain where people want to develop their lifestyles and the organization dimensions of their daily life, as well as to find self- fulfilment. They define and explains leisure time as "*a characteristic feature of the quality of life of societies with a high level of development, and is particularly regarded as a measure of personal freedom, participation in social life and the well-being of the citizens living in it" (pp. 139).* Accordingly, leisure time beside entertainment, recreation and a break from work, also includes education, political and social action as well as health orientation (Zarotis et al, 2020).

For Erinjeri and Lobo (2023), leisure times activities are one of the most important aspects of life, especially for students because they allow them to participate in extracurricular activities outside of the classroom and advance their development of active behavior. Their study interest was to see and explore how students spend their free time and how it impacts their academic achievement. They investigated how college students in India allocate their leisure time across various activities and examines the relationship between these activities and academic performance. The study focuses on six components of leisure activities: physical activities, indoor activities, social activities, reading activities, dating/relationship activities, and recreational activities. Data was collected using a questionnaire-based method distributed to 168 students across multiple universities in India, covering various academic disciplines. The findings

highlight the significant impacts of different leisure activities on students' academic success (Erinjeri, M., & Lobo, L. 2023).

Talking for the function of the leisure time we will refer to Karaderi (2021) and his review for the basic functions of the leisure time. As he reports referring to Kara and Özdedeoğlu (2017) leisure time has three basic functions namely rest function, development function and entertainment function (2021: 41-42) which we will present in the following table.

Table1: Functions of the leisure time

Rest Function	**Entertainment Function**	**Development Function**
This function refers to leisure time, offering individuals with various activities the opportunity to relax, recur their energy and physical strength, get rid of stress and negativity in their lives (Akyüz, 2015; Supramaniam et al., 2020).	It provides the opportunity to participate in some activity types, whether active or passive (not required by daily needs), with its contributions to health, emotional life, physical and psychological mood, eliminating boredom in individuals (Walker & Wang, 2009). In this context, it creates the resting function in the individual (Abayomi et al, 2017).	If used duly and within the framework of its value, the concept of leisure time can bring many essential features such as rest, entertainment, self-improvement, development. It is important for the individual's socialization, developing their views and vision, disseminating their freedom, and finding themselves (Karaküçük 2005).

Source: Kara and Özdedeoğlu (2017)

Leisure activities play a crucial role in modern life, offering essential opportunities for rejuvenation and relaxation amidst the pressures of daily routines. Scholars like Tel & Köksalan (2008), Latip et al. (2020), and Ibrahim and Cordes (2002) highlight the significance of leisure time in enhancing physical and mental well-being. These activities are voluntary and driven by personal satisfaction, effectively reducing fatigue and promoting creativity. Participating in recreational activities yields numerous benefits. Firstly, they foster skills such as teamwork, leadership, and decision-making, which are invaluable both personally and professionally. They also contribute to personal growth by bolstering confidence, promoting responsible behavior, and enhancing physical fitness. Socially, leisure activities facilitate socialization and the formation of new friendships, enriching one's social network and sense of belonging. While talking for the benefits of leisure time activities Yerlisu et al., (2010), assume that engaging in leisure pursuits offers psychological benefits by reducing stress and fostering relaxation. It provides opportunities for personal satisfaction, learning, and environmental awareness.

Importantly, these activities contribute to a balanced lifestyle, promoting overall health and well-being. In essence, leisure activities are not merely pastimes but essential components of a fulfilling life, offering opportunities for growth, relaxation, and enrichment across various aspects of human experience.

3. The importance of time management among students

Enhancing student leisure time management can significantly improve their overall well-being, academic performance, and personal development. Students today lack the knowledge necessary to manage their time effectively. While some students utilize their free time to study, complete schoolwork, and participate in other school activities, others spend it using technology, social media, and online gaming. The other half of their time is divided between various extracurricular and leisure activities.

The research conducted by Nesrullah and Kahn (2015) underscores the critical importance of time management skills in relation to academic achievement among students. As they state, effective time management isn't just about organizing schedules; it directly impacts overall performance and success in academic pursuits. Students who effectively manage their time are likely to experience positive outcomes in their academic endeavors. This includes improved grades, better understanding of course materials, and reduced stress levels. Conversely, poor time management can lead to procrastination, incomplete assignments, and heightened anxiety, ultimately hindering academic performance. Creating a conducive environment and setting realistic goals are crucial components of effective time management. When students are able to prioritize tasks, allocate sufficient time for studying, and maintain a balanced schedule that accommodates their academic responsibilities alongside personal interests and needs, they are more likely to excel academically. However, many students struggle with time management skills. Factors such as distractions, poor planning, and difficulty in prioritizing tasks can contribute to this challenge. Recognizing the importance of time management and developing strategies to improve it are essential steps towards achieving academic success.

Educational institutions and educators also play a pivotal role in supporting students in this regard. Providing guidance on time management techniques, offering resources for planning and organization, and fostering a supportive learning environment can significantly aid students in developing and refining their time management skills.

As they conclude, while academic achievement is influenced by various factors, the ability to manage time effectively stands out as a critical determinant. Students who master this skill are better positioned to navigate their academic journey successfully, leading to enhanced overall performance and personal growth (2015:66).

Conceptual Framework

The study proposes the following mediated pathway (adapted from CASEL, 2020; Au et al., 2023):

Innovative Teaching Practices & SEL-Infused Programs (e.g., experiential workshops, inclusive events,

reflective activities)

↓

Enhanced SEL Competencies (CASEL's five domains)

↓ (mediation)

Effective Leisure Time Management (planning, diverse restorative activities, reduced passive screen time).

This model is supported by evidence that SEL builds self-management and responsible decision-making, which in turn enable better prioritization and satisfaction with free time use (Terzi, 2024).

4. METHODOLOGY

This study adopts a mixed-methods descriptive and evaluative approach using two complementary data sources from International Balkan University (IBU):

Pilot Leisure Time Management Survey (quantitative): An online Google Forms questionnaire administered to 106 IBU students (ages 16–27, >60% female). It assessed daily free time availability, multi-select leisure activities, and demographics. Analyses included descriptive statistics, means, standard deviations, and Pearson/Spearman correlations.

Student Wellbeing Center (SWC) Program Evaluation Data (2024/25 academic year): Metrics from a comprehensive wellbeing hub guided by SEL, PERMA, and Ryff frameworks (CASEL, 2020; Kern et al., 2015). Ethical approval was obtained through institutional channels, and participation was voluntary.

Results and Findings

Leisure Time Patterns from the Pilot Survey (N=106) Students reported a moderate amount of daily free time (M = 2.58 hours, SD = 1.33). Dominant activities included social media (63.2%) and socializing with friends (57.5%), consistent with patterns observed in other university samples (El Hadad, 2024). Age-related patterns revealed strong negative correlations for social media and socializing, indicating younger students were more engaged in these activities.

1. Leisure Time Patterns – Pilot Survey (N=106 IBU Students)

Table 2: Participant Demographics and Daily Free Time Distribution (N=106)

Age Group		**%**	**Daily Free Time Category**	**N**	**%**	**Assigned Hours**
16–18	3	2.8	More than 3 hours	45	42.5	4
19–21	76	71. 7	1–3 hours	42	39.6	2
22–24	23	21.7	Less than 1 hour	19	17.9	0.5
25–27	4	3.7	Mean	–		2.58
Total	106	100	Standard Deviation (SD)	–		1.33

Source: Author data's

As our results suggest, presented in the table above (Table 2), the sample was predominantly composed of students aged 19–21 (71.7%). On average, participants reported 2.58 hours of daily free time (SD = 1.33), with 42.5% having more than 3 hours and 17.9% having less than 1 hour. This distribution underscores the constrained yet variable nature of students' leisure time and highlights the potential for innovative teaching practices and student support programs to promote more balanced and purposeful use of available free time.

Table 3: Most Common Leisure Activities (Multi-select)

Activity	**Responses**	**Percentage**
Social Media	67	63.2%
Socializing with friends	61	57.5%
Reading	42	39.6%
Hobby	35	33.0%
TV	23	21.7%
Studying	22	20.8%
Sports	15	14.2%
Other (various)	Low	<3% each

Source: Author data's

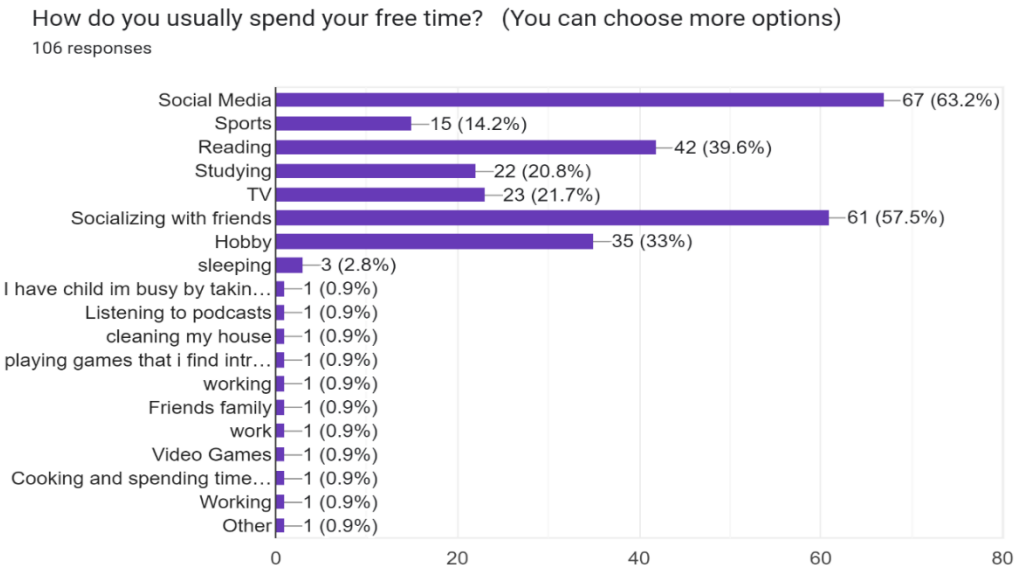


Fig. 1: Most Common Leisure Activities (Multi-select)

Source: Author data's

Correlation analyses showed positive associations between more free time and engagement in social media, socializing, reading, and hobbies. Strong negative correlations with age were found for social media and socializing with friends (younger students are more engaged), with moderate negative correlations for reading, hobbies, and studying.

Table 4: Correlation Between Daily Free Time and Leisure Activities

Activity	**Correlation with Free Time**
Social Media	0.7529
Sports	0.4339
Reading	0.8658
Studying	0.5470
TV	0.5626
Socializing with friends	0.7846
Hobby	0.7504
Sleeping	0.1824
Other Activities	0.3819

Source: Author data's

As presented in the table (Table 4), correlation analysis revealed positive associations between the amount of daily free time and engagement in various leisure activities. Stronger positive correlations were observed for reading (0.8658), socializing with friends (0.7846), social media (0.7529), and hobbies (0.7504), indicating that students with more available free time tend to spend it on these activities. Moderate positive correlations appeared for studying (0.5470), TV watching (0.5626), and sports (0.4339), while weaker associations were found for sleeping (0.1824) and other miscellaneous activities (0.3819). These results suggest that greater availability of free time is linked to higher engagement in both passive (e.g., social media) and more developmental or social activities, highlighting opportunities for guiding students toward more balanced and restorative leisure choices through innovative teaching and wellbeing programs.

The following table (Table 5) summarizes the Pearson correlation coefficients, indicating how strongly each activity is associated with the amount of free time respondents have. A higher positive value indicates a stronger positive correlation, meaning that as free time increases, the likelihood of engaging in that activity also increases. To find the correlation between age and activities, we follow a similar process to the one we did for free time and activities. We convert the age categories into numerical values and then calculate the correlation coefficients with each activity.

Table 5: Correlation Between Age and Leisure Activities

Activity	**Pearson Correlation with Age**	**Spearman Correlation with Age**
Social Media	-0.709	-0.748
Sports	-0.330	-0.335
Reading	-0.476	-0.498
Studying	-0.359	-0.369
TV	-0.364	-0.374
Socializing with friends	-0.638	-0.673
Hobby	-0.430	-0.448
Sleeping	-0.378	-0.364
Other Activities	-0.322	-0.324

Source: Author data's

As shown in the table above (Table 5), correlation analysis between age and leisure activities revealed consistent negative associations. Strong negative correlations were found for social media (Pearson = -0.709, Spearman = -0.748) and socializing with friends (Pearson = -0.638, Spearman = -0.673), indicating

that younger students are significantly more likely to engage in these activities. Moderate negative correlations appeared for reading (Pearson = -0.476, Spearman = -0.498), hobbies (Pearson = -0.430, Spearman = -0.448), and studying (Pearson = -0.359, Spearman = -0.369). Weaker negative correlations were observed for sports, TV watching, sleeping, and other activities.

These results suggest that as students get older, engagement in many leisure activities — particularly social media and socializing — tends to decrease, possibly reflecting shifts in priorities, responsibilities, or available free time. This age-related pattern underscores the need for tailored, innovative teaching and well-being interventions that promote balanced leisure habits across different student cohorts.

2. SWC Innovative SEL Practices and Outcomes (2024/25)

SWC SEL-Infused Innovative Practices and Outcomes (2024/25)

The SWC engaged approximately 60.9–69.6% of the student body, with satisfaction reaching 71.4% overall and 77% for major social activities. Key activities such as Spring Fest and Art Therapy workshops fostered SEL competencies and PERMA elements (Positive Emotion, Relationships, Engagement), aligning with evidence that experiential SEL practices enhance wellbeing (Severino, 2026; Hareli, 2025).

Table 6: Key Performance Indicators – Student Wellbeing Center (2024/25)

Metric	Value
Unique Students Engaged	3,500–4,000 (60.9–69.6%)
Total Interactions	5,000–6,000 (86.9–104.3%)
Satisfaction Rate	71.4% overall (77% for social events)
CAPS Workshop Participants	1,050 (18.3%)
Spring Fest Participants	1,820 (31.7%)
Student Club Events	40+ (8.7% students)
Counseling Sessions	30 (doubled from the previous year)

Source: Annual Analyses Student Well-being www.ibu.edu.mk

Major SEL-aligned events included Spring Fest (Art Therapy, inclusive activities – fostering Positive Emotions and Relationship Skills), Iftar Dinners (21.7% participation – building belonging), and Psychological First Aid training (high impact scores). Engagement grew significantly from 2023/24, with notable increases in CAPS and club activities.

Satisfaction: 71.4% overall, 77% for social activities (e.g., Spring Fest, Iftar), reflecting strong community impact.

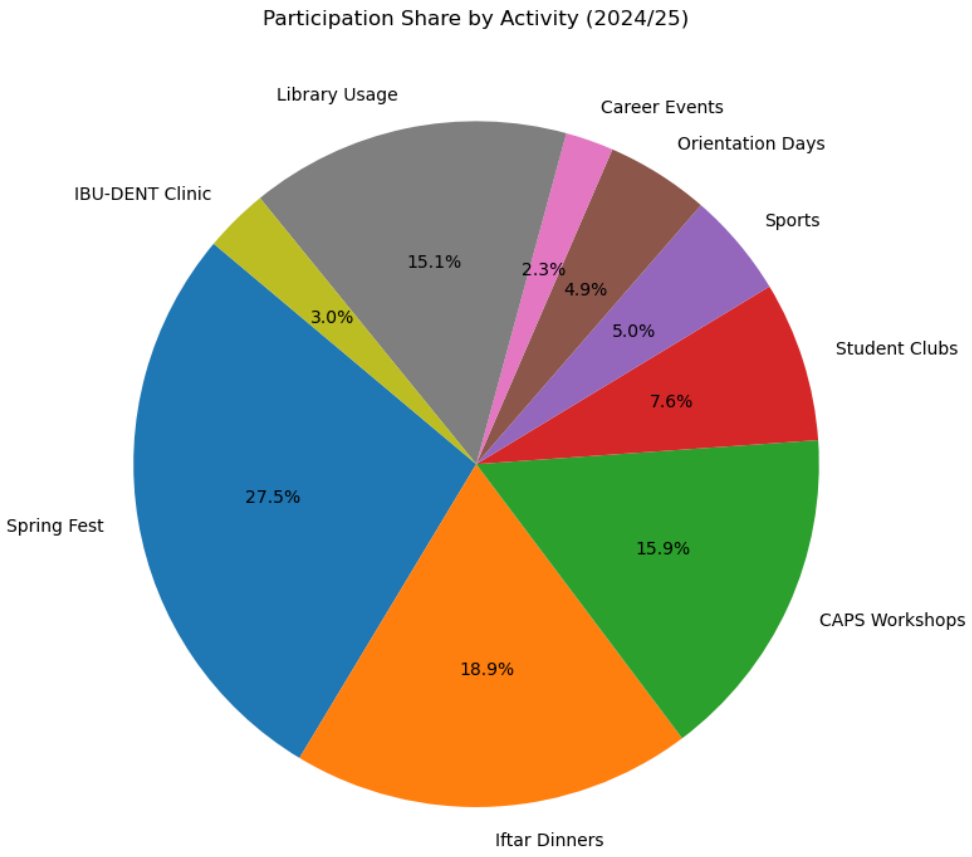


Fig. 2: Students' participation in different activities

Source: Annual Analyses Student Well-being www.ibu.edu.mk

Table 7: Key Performance Indicators (2024/25)

Metric	**Value**
Unique Students Engaged	3,500–4,000 (61–70%)
Total Interactions	5,000–6,000
CAPS Workshop Participants	1,050 (18%)
Counseling Sessions	30
Spring Fest Participants	1,820 (32%)
Student Club Participants	500 (9%, 40+ events)
Satisfaction Rate	71.4% overall, 77% social

Source: Annual Analyses Student Well-being www.ibu.edu.mk

Student Wellbeing Center (SWC) Engagement and Impact (2024/25)

During the 2024/25 academic year, the Student Wellbeing Center (SWC) achieved substantial reach and positive outcomes across the university's 5,749 students. Overall engagement ranged from approximately 60.9% to 69.6% of the student body, with total interactions reaching 86.9–104.3% (reflecting multiple participations per student). This marked a significant increase compared to the previous year and demonstrated strong student interest in wellbeing initiatives. Major events drove much of this engagement. Spring Fest attracted around 31.7% of students, while Iftar Dinners engaged 21.7%. The Counseling and Psychological Services (CAPS) workshops reached approximately 18.3% of students, with individual counseling sessions delivered to 0.5% and external referrals made for 0.1%. Student clubs organized over 40 events, involving about 8.7% of the student population. Sports activities engaged roughly 5.7% of students, with notable participation in Football (2.5%), Volleyball (1.0%), Table Tennis (0.7%), and other disciplines. Student satisfaction was high, reaching 71.4% overall and 77% for major social and community events. These results highlight the effectiveness of the SWC's innovative, SEL-infused programs in fostering engagement, community cohesion, and well-being support.

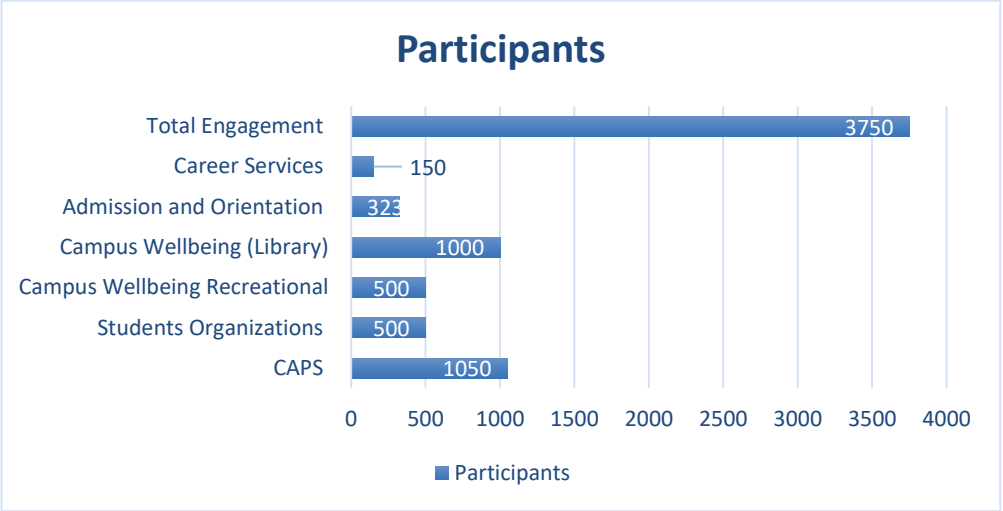


Fig. 3: Students' engagement and impact

Source: Annual Analyses Student Well-being www.ibu.edu.mk

Semester Comparison of SWC Activities (Fall 2024 vs. Spring 2025)

A comparison between the Fall 2024 and Spring 2025 semesters highlights the SWC's adaptability and growing impact. In Fall 2024, engagement reached approximately 30.4–34.8% of students, with total

interactions between 43.5–52.2%. Key activities included Orientation Days (5.6%), CAPS workshops (8.7%, such as Art Therapy and "What Is Your Story?" sessions), student clubs (4.3%), and sports (2.6%). These efforts primarily built foundational SEL skills in self-awareness and relationships, with students noting that "Orientation made me feel welcomed.

In Spring 2025, engagement levels remained stable at 30.4–34.8%, but participation in major events surged dramatically. Highlight activities included Spring Fest (31.7%), Iftar Dinners (21.7%), CAPS workshops (9.6%, including Psychological First Aid), student clubs (4.3%), and sports (approximately 3.1%). This semester strengthened community cohesion and demonstrated effective crisis response (e.g., Social Awareness initiatives), with students reporting that "Spring Fest made me feel part of the IBU family." Challenges noted included coordination delays and low counseling uptake in Fall, and some inclusivity gaps in Spring.

Overall, the comparison illustrates the SWC's ability to maintain consistent engagement while scaling high-impact innovative events, particularly in the spring semester, thereby enhancing student well-being and SEL development across the academic year.

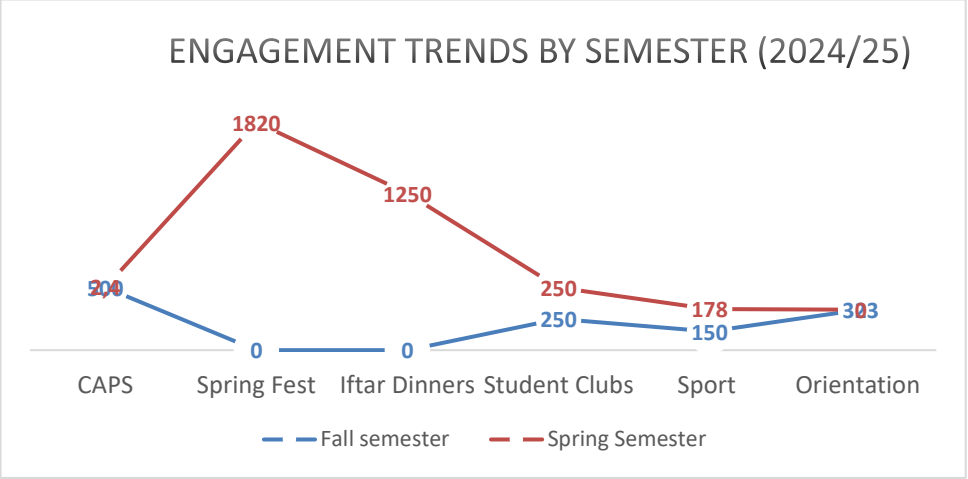


Fig. 4: Engagement Trends by Semester (2024/25)

Source: Annual Analyses Student Well-being www.ibu.edu.mk

Comparative Metrics by Semester

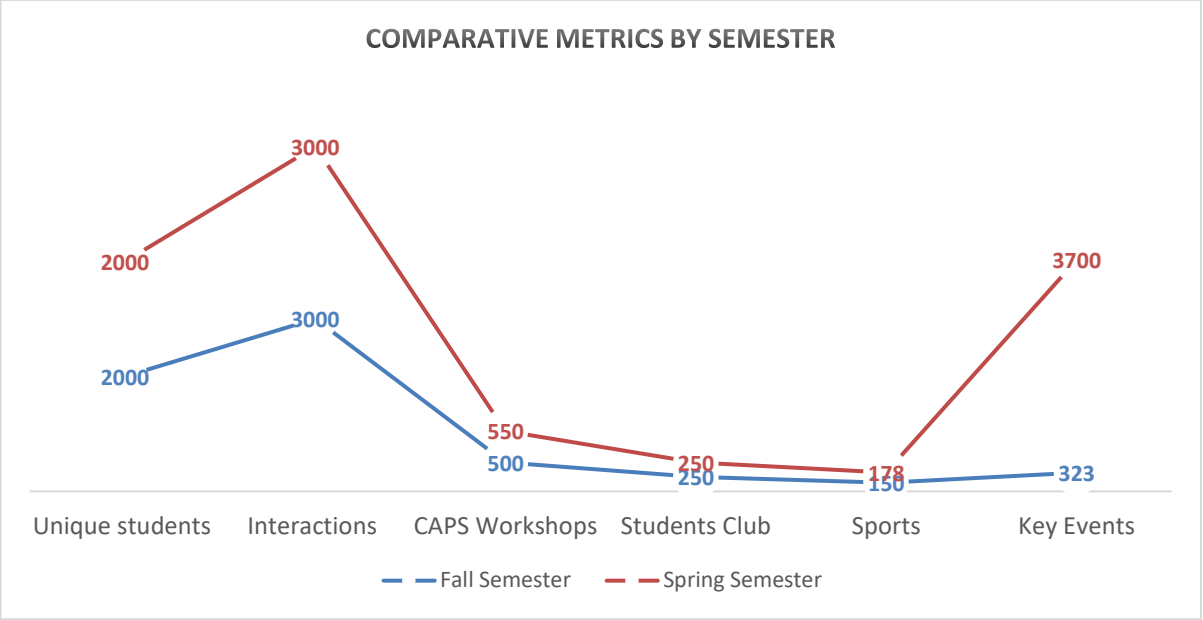


Figure 5: Comparative Metrics by Semester

Source: Annual Analyses Student Well-being www.ibu.edu.mk

Key Insights from Semester Comparison

The analysis reveals several important patterns. Engagement remained relatively consistent across both semesters, demonstrating the SWC's stable foundation. Notable growth occurred in CAPS workshops and sports activities, indicating increasing student interest in wellness and physical engagement. The most significant surge was seen in major events, where participation jumped from 5.6% in Fall to 64.4% in Spring, largely driven by high-impact initiatives such as Spring Fest and Iftar Dinners. Meanwhile, student club activities maintained steady participation, reflecting sustained interest in peer-led initiatives.

These insights underscore the SWC's adaptability and the effectiveness of innovative, SEL-infused events in boosting student involvement and well-being throughout the academic year.

Discussion

The pilot leisure time survey (N=106) highlights a common challenge among university students: moderate daily free time (M = 2.58 hours) that is heavily dominated by passive activities, particularly social media (63.2%) and socializing with friends (57.5%). Younger students (19–21 age group) show especially high engagement in screen-based leisure, while participation in more active or developmental activities (sports, hobbies, reading) remains relatively low. These patterns align with broader literature indicating that suboptimal leisure management contributes to increased stress and reduced well-being

(Terzi, 2024; El Hadad, 2024).

In contrast, the Student Wellbeing Center's (SWC) innovative programs during 2024/25 demonstrate a promising counter-approach. The SWC engaged 60.9–69.6% of the 5,749 students, with total interactions reaching 86.9–104.3%. Engagement remained stable across semesters, but major events drove significant growth — participation in key activities surged from 5.6% in Fall to 64.4% in Spring, led by Spring Fest (31.7%) and Iftar Dinners (21.7%). CAPS workshops and sports also showed moderate increases, reflecting growing interest in wellness and physical engagement. Satisfaction reached 71.4% overall (77% for social events), with students reporting stronger community belonging and reduced anxiety.

These outcomes are strongly supported by evidence-based innovative teaching strategies documented at IBU. Ziberi (2025) shows that methods such as project-based learning, role-play with emotional engagement ("emotional cup" technique), personalized learning, and peer evaluation significantly boost student motivation, empathy, critical thinking, and self-awareness. The SWC's activities (Art Therapy, Spring Fest, Psychological First Aid) build directly on these approaches by embedding SEL competencies in experiential and inclusive formats.

Proposed Pathway: Innovative teaching and support programs that incorporate SEL strengthen self-management and relationship skills (CASEL framework), which in turn enable students to manage leisure time more intentionally — shifting from passive screen use toward restorative, balanced activities. The semester comparison and key insights confirm the SWC's adaptability and the power of high-impact events to drive engagement and positive change.

Limitations

The study has several limitations. The leisure time survey is pilot-scale (N=106) and relies on self-reported data, which may be subject to recall or social desirability bias. The SWC metrics are primarily descriptive and program-based rather than experimental. Causal relationships between SEL-infused activities, resilience, and leisure management cannot be definitively established without longitudinal or controlled designs. Additionally, the data are specific to IBU and may have limited generalizability to other institutions**.**

Conclusion and Recommendations

This paper demonstrates that innovative teaching practices and student support programs can create a positive pathway toward enhanced well-being, resilience, and effective leisure time management. The

combination of diagnostic insights from the pilot survey and practical evidence from the SWC and IBU's innovative teaching initiatives (Ziberi, 2025) provides a compelling model for higher education.

Practical Recommendations

- Embed SEL elements and innovative methods (e.g., project-based learning, role-play with emotional engagement, and peer evaluation) into regular classroom teaching.
- Scale wellbeing center programs with explicit leisure time planning workshops and balanced technology use initiatives.
- Encourage students to diversify leisure activities through campus clubs, sports, cultural events, and creative workshops.
- Conduct regular monitoring and longitudinal studies to measure long-term impact on resilience and well-being.

By systematically integrating socioemotional learning into innovative teaching and support structures, universities can better equip students to thrive academically while maintaining balanced, fulfilling lives. Future research should explore the long-term effects of these approaches across different disciplines and cultural contexts.

References

Au, A., et al. (2023). The impact of sense of belonging, resilience, time management skills and academic performance on psychological well-being. Cogent Education. https://doi.org/10.1080/2331186X.2023.2215594

CASEL. (2020). CASEL's SEL Framework. https://casel.org/fundamentals-of-sel/

Cassidy, S. (2015). Resilience building in students: the role of academic self-efficacy. Frontiers in Psychology, 6. https://doi.org/10.3389/fpsyg.2015.01781

Conley, C. (2024). SEL for well-being and equity in higher education. Loyola University Chicago.

"Empowering Resilience: A Year of Growth and Community", Students Wellbeing Center (SWC), International Balkan University, Annual report, www.ibu.edu.mk

El Hadad, S. R. (2024). Mental health and leisure time management of university students. Egyptian

Journal of Nursing.

Elmi, C. (2020). Integrating social emotional learning strategies in higher education. Journal of STEM Education.

Erinjeri, M., & Lobo, L. (2023). The Impact of Leisure Time Activities on the Academic Performance among College Students. International Journal for Research in Applied Science and Engineering Technology. https://doi.org/10.22214/ijraset.2023.48600.

Erinjeri, M., & Lobo, L. (2023). The impact of leisure time activities on academic performance. International Journal for Research in Applied Science and Engineering Technology.

Gallagher, K. M., & Stocker, S. L. (n.d.). A Guide to Incorporating Social-Emotional Learning in the College Classroom.

Hareli, M. (2025). Infusing social-emotional skills into a career and life planning course. ScienceDirect.

Ibrahim, H. & Cordes, K.A. (2002). Outdoor recreation, champaign. 2. Sagamore Yayıncılık.

Karaderi, B. (2021). Leisure time spending tendencies of university students. Asian Journal of University Education.

Karaderi, B. (2021). Leisure Time Spending Tendencies of University Students: The Case of TRNC. Asian Journal of University Education (AJUE) Volume 17, (41-50).

Karagöz, Ş. (2022). The effect of leisure time satisfaction levels of university students. ERIC.

Latip, M. S. A., Newaz, F. T., & Ramasamy, R. (2020). Students' Perception of Lecturers' Competency and the Effect on Institution Loyalty: The Mediating Role of Students' Satisfaction. Asian Journal of University Education, 16(2), 183-195.

Nasrullah, Sh & S Khan, M. S. (2015). The Impact of Time Management on the Students' Academic Achievements. 11

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. Journal of Personality and Social Psychology.

WSeverino, B. (2026). SEL in higher education: Practical recommendations. Journal of Effective Teaching in Higher Education.

Severino, B. (2026). SEL in higher education: Practical recommendations. Journal of Effective Teaching in Higher Education.

Tel, M. & Köksalan, B. (2008). Sociological examination of faculty members 'sports activities, [Sociological examination of faculty members' sports activities]. Fırat University Journal of Social

Science, 18 (1), 261-278.

Terzi, E. (2024). University students' free time management and quality of life. PMC. https://pmc.ncbi.nlm.nih.gov/articles/PMC11056060/

Versteeg, M. and Kappe, R. (2021). Resilience and higher education support as protective factors for student academic stress and depression during COVID-19 in the Netherlands. Frontiers in Public Health, 9. https://doi.org/10.3389/fpubh.2021.737223

Wang, F. (2025). University students' socio-emotional skills. Studies in Higher Education.

Yerlisu, L.T., Ardahan, F. & Yıldız, F. (2010). Profiles of individuals participating in cycling activities, reasons for doing this sport and the benefits they obtain. 11. International Sport Sciences Congress, Antalya.

Zarotis, G. F. i Tokarski, W. (2020). "Definition, Concepts and Research about Leisure Time", International Journal of Innovative Research and Knowledge, 5(2), 139-149. (PDF) Family Leisure Time and Well-Being. Available from: https://www.researchgate.net/publication/376958139_Family_Leisure_Time_and_Well-Being

Zarotis, G. F., & Tokarski, W. (2020). Definition, concepts and research about leisure time. International Journal of Innovative Research and Knowledge.

Zhang, J., et al. (2017). How do academic stress and leisure activities influence college students' emotional well-being? Journal of Adolescence.

Ziberi, F. (2025). Evidence-based strategies and good practices in higher education. In O. Kurt (Ed.), Innovative and Evidence-Based Teaching in Higher Education (pp. 165-180). IBUPress. Book Details | IBUPress

Protection of employees in the event of employer insolvency - an analysis of the rules of the European directive in light of the CJEU case law

Sergiu-Cătălin OLTEANU[18]

Abstract

This article analyses the European legal framework on the protection of wage claims in the event of employer insolvency, based on Directive 2008/94/EC and the relevant case law of the CJEU. The primary purpose of this study is to evaluate the effectiveness of guarantee institutions in securing outstanding remuneration for workers during insolvency proceedings. It aims to clarify the limits of State discretion regarding the capping of claims while maintaining the social objective of minimum protection. Furthermore, the research seeks to highlight the legal principle of State liability for damages caused by the delayed transposition of European social directives.

The methodology involves a comprehensive review of CJEU jurisprudence, focusing on the landmark *Francovich* case, which established State liability for non-transposition. The analysis also examines the *Valero* and *Cordero Alonso* cases, which prohibit discrimination between claims established by court decisions and those by amicable agreements. Finally, the article explores cross-border responsibilities, specifying that the Member State where the activity was carried out remains liable for payment. In conclusion, the research emphasizes that uniform application of these rules is vital for ensuring legal certainty and social rights throughout the Community.

Keywords: Directive 2008/94/EC, guarantee institution, unpaid wage claims, employer insolvency, CJEU case law.

JEL Code: K31

The European Union has established minimum standards for the protection of employees in the context of employer insolvency.

In this article, we will present the European directive on the protection of employees in the context of the employer's insolvency and the relevant case law of the Court of Justice of the European Union (CJEU) on the matter.

[18] Sergiu-Cătălin Olteanu is an assistant professor at the Faculty of Law of Bioterra University, Bucharest, and holds a doctorate in law from the Faculty of Legal Sciences of the University of Osnabrück, Germany, sergiu.olteanu@bioterra.ro, ORCID ID: 0009-0006-5672-8430,

1. Presentation of the directive on the protection of employees in the event of the insolvency of their employer

The purpose of the directive on the protection of employees in the event of the insolvency of their employer[19] is to ensure the satisfaction of employees' outstanding claims in the event of the insolvency of the employer. Unlike Article 39 of the EC Treaty, which, in the context of the free movement of workers, is based on a European understanding of the term 'worker', Article 2(2) of the Directive refers to national provisions on the definition of 'worker', without thereby authorising Member States to establish their own definition of 'worker' specifically for the purpose of implementing the Insolvency Benefits Directive. The provisions on the protection of wage claims in the event of insolvency therefore protect only those who are considered to be workers under national law.

The rights of employees protected by the Directive on the protection of employees in the event of the insolvency of their employer are regulated in Article 3(1) and (4). According to this provision, the guarantee institutions to be established are intended to ensure the satisfaction of outstanding claims arising from employment contracts, including – where provided for by national law – the payment of severance pay upon termination of the employment relationship. Member States may not make the right to insolvency benefits conditional on a minimum duration of the employment contract. However, the Insolvency Benefits Directive does not define the term ‘pay’, but merely refers to national definitions.

Member States may, in exceptional cases, exclude claims of certain groups of workers if other forms of security can be shown to offer those affected protection equivalent to that offered by the Insolvency Directive. Member States may exclude domestic workers employed by a natural person from the scope of the Directive on the protection of employees in the event of the insolvency of their employer. However, they may not, in principle, exclude part-time workers, workers on fixed-term contracts or temporary workers from its application.

The Directive on the protection of employees in the event of the insolvency of their employer obliges Member States to create an institution to guarantee the satisfaction of employees' unpaid claims.

An employer is considered insolvent if a request has been made for the opening of insolvency proceedings provided for by the laws, regulations and administrative provisions of a Member State, which presuppose the insolvency of the employer and result in the partial or total seizure of the employer's assets and the appointment of an administrator or a person exercising a similar function, and if the competent authority under the aforementioned laws, regulations and administrative provisions has decided to open the proceedings or has found that the employer's activity or undertaking has been definitively closed and the assets are insufficient to justify the opening of the proceedings (Article 2 Directive 2008/94/EC).

[19] Directive 80/987/EEC, published in OJ L 283 of 20.10.1980, as amended by Directive 2002/74/EC published in OJ L 270 of 08.10.2002, was repealed by Directive 2008/94/EC, published in OJ L 283 of 28 October 2008.

Member States may limit the payment obligations of these guarantee institutions under certain conditions. This is aimed, firstly, at preventing the financial strain on the guarantee institutions and, secondly, at ensuring protection against their abusive use.

The possibility of limiting the time period for claims against the guarantee institution depends on the point in time chosen by the Member State concerned as the starting point for calculating the period for which the guarantee institution must guarantee wages. If the date of insolvency is the determining factor, the payment of outstanding wage claims for the last three months of the employment relationship, which fall within a period of six months prior to the employer's insolvency, must be ensured. If the relevant period is the termination of the employment relationship due to the employer's insolvency, the guarantee institution must ensure the payment of outstanding wage claims for the last three months of the employment relationship. Member States may provide that this minimum period of three months falls within a reference period of six months. Member States which provide for a reference period of at least 18 months may limit the period for which guarantee institutions must satisfy outstanding claims to eight weeks.

The Directive in question does not prevent the introduction of a limitation period or a time limit within which an employee must submit a claim for the recovery of wage claims under national law, provided that the time limit in question is not less favourable than that applicable to similar national claims (principle of equal treatment) and is designed in such a way as not to make the exercise of rights conferred by Community law practically impossible (principle of effectiveness).

In addition to the time limits, Member States also have the option of limiting the amount of benefits payable by the guarantee institution. This maximum limit must not fall below a social threshold compatible with the social objectives of the Directive on the protection of employees in the event of the insolvency of their employer. However, that Directive does not specify the maximum limit at which the social objectives of the Directive could be undermined.

Member States may also provide that the payment guarantee does not apply to contributions to social security schemes or supplementary pension schemes. However, they shall take the necessary measures to ensure that the failure to pay compulsory social security contributions to their respective insurance institutions, which were due by the employer before the onset of its insolvency, does not result in any disadvantage for the employees' rights to benefits in regards of those insurance institutions, to the extent that the employees' contributions have been deducted from the wages paid.

In the event of the insolvency of an employer operating in the territory of at least two Member States, the Member State in whose territory the workers concerned operated shall be responsible for paying the workers' outstanding claims.

2. Presentation of the CJEU case law on the protection of employees in the event of the employer's insolvency

Below we will present some cases with European relevance that are useful for understanding the issue of protecting unpaid wage claims by creating a special fund in case of employer insolvency, namely: *Francovich*[20], *INPS/Alberto Barsotti*[21], *Valero*[22] and *Alonso*.[23]

2.1. Insolvency protection of employees in the event of employer insolvency

In the case of " *Francovich* " CJEU was requested to answer two questions under Article 177 of the EC Treaty on the interpretation of Article 2 of Directive 80/987/EEC. Those questions were raised in proceedings between Mr. Francovich and the Italian Republic concerning a claim for compensation brought against the State on account of the late transposition of that directive. Under Article 11(1) of that directive, the Member States were required to adopt the laws, regulations and administrative provisions necessary to comply with that directive by 23 October 1983. The Italian Republic has failed to fulfil its obligation to transpose it under Article 11 of Directive 80/987/EEC within that period.

Mr. Francovich, an employee of a company in Vicenza, brought an action before the Court of Vicenza, which ordered the defendant company to pay him a sum of money. Mr. Francovich also brought an action before the same court, seeking a declaratory judgment requiring the Italian State to guarantee his insolvency claims against his employer or to compensate him for the damage suffered as a result of the failure to implement the directive. At the same time, Ms. Bonifaci and thirty-three other employees of a company declared insolvent brought a similar action before the Court of Basano del Grappa.

The two national courts referred the same questions to a preliminary ruling on the direct effect of the provisions of Directive 80/987/EEC and on the right to compensation for damage suffered in connection with the provisions of the directive which do not have direct effect and which have not been properly transposed.

The CJEU ruled that the EU legislator expressly limited the scope of the Directive so that employees with a contract or employment relationship with an employer who, under the rules applicable in the Member State concerned, is not subject to a collective creditors' settlement procedure cannot rely on the rights created by the Directive. Such an employer cannot be "insolvent" within the specific meaning of that term in the Directive.[24]

[20] See CJEU, judgment of 19.11.1995, cases C-6/90 and 9/90, *Francovich*, in ECR 1991, p. 5357.
[21] See CJEU, judgment of 04.03.2004, case C-19, 50, 84/01, *INPS/Alberto Barsotti*, *Milena Castellani*, *Anna Maria Venturi*, in Neue Magazine für das Insolvenzrecht (NZI) 2004, p. 334.
[22] See CJEU, judgment of 16.12.2004, Case C-520/03, *Valero / Fondo de Garantía Salaria*, in NZI 2005, p. 175.
[23]See CJEU, Judgment of 07.09.2006, case C 81/05, *Alonso1R*, in ECR 261/2006, p.4.
[24] See CJEU, judgment of 09.11.1995, case C-479/93, *Francovich*, in ECR 1995, p. 3843, paragraph 19.

The CJEU considered that the proposal for a directive indicated that, even before its adoption, several Member States already had mechanisms in place to protect employees' claims in the event of the employer's insolvency, although these mechanisms varied considerably and that some Member States did not have such mechanisms. Therefore, the extension of the obligation to establish mechanisms to protect employees' claims in the event of the employer's insolvency, as provided for in Article 2(1) of the directive, undoubtedly represents progress towards improving the living and working conditions of workers throughout the Community and towards the gradual harmonisation of the relevant legislation.[25]

The CJEU ruled that, due to the lack of timely implementing measures, the affected individuals were unable to bring actions before the competent national courts and that the Member State must compensate individuals for the damage resulting from the failure to implement the directive in a timely manner.[26]

2.2. Admissibility of maximum limits for the payment obligation of a guarantee institution

In the dispute between the Instituto Nation from previdenza sociale (INPS) and Mr. Barsotti and Others, and between Ms. Venturi, Ms. Castellani and INPS, the Tribunale di Pisa, the Tribunale di Siena and the Corte suprema di cassazione, under Article 234 EC, have referred a number of questions on the interpretation of Directive 80/987/EEC. Mr. Barsotti and Others, Ms. Castellani and Ms. Venturi sought payment of salaries from that fund for the last period of performance of their employment contracts.

INPS rejected these claims as unfounded. The Pisa Court ordered INPS, by decision, to pay Mr Barsotti the full amount for the work carried out in the previous three months, plus an amount representing the adjustment for the inflation rate, statutory interest and legal costs. INPS, on behalf of the fund, requested the annulment of the decision and stated that it owed nothing, since the applicant had received the maximum amount due to him in advance payments made by his employer and that, therefore, whether the payment had been made by the employer or by the special fund was irrelevant.

In this context, the Pisa Court stayed the proceedings and referred the case to the CJEU, which decided that the provisions of Directive 80/987/EEC must be interpreted as not allowing a Member State to limit the payment obligation of guarantee institutions to an amount covering the necessary living expenses of the workers concerned, less the payments made by the employer during the period covered by the guarantee.

[25] See CJEU, judgment of 09.11.1995, case C-479/93, *Francovich*, in ECR 1995, p. 3843, paragraphs 26 and 27.

[26] With this decision, the CJEU established for the first time the principle of Member States' liability for the consequences of a Member State's conduct contrary to EU law in failing to transpose directives into national law within the prescribed period. This constitutes, alongside infringement procedures and the direct applicability of directives, an additional sanction mechanism developed by the CJEU against Member States that delay in implementing directives. The right to compensation was justified on the grounds that the full effectiveness of EU law would be undermined if individuals were not at least entitled to compensation for the damage resulting from the denial of a legal position provided for in their favour by the directive. This applies in particular where the implementation of the provisions of the directive cannot be directly applied by individuals due to the lack of direct applicability.

Therefore, in the light of the CJEU, the directive in question does not preclude national legislation which sets a ceiling for the payment of claims, provided that this ceiling does not make it impossible or excessively difficult to achieve the social objective of the directive (minimum protection of employees).

2.3. Definition of compensation for illegal dismissal as remuneration

In the dispute between José Vicente Olaso Valero and the Salary Guarantee Fund (FOGASA), the Superior Court of Justice Valenciana asked the ECJ several questions regarding compensation in the event of illegal dismissal.

In the present case, by an agreement between the parties reached on 15 December 1999, in the context of the procedure for challenging the dismissal, the dismissal of the employee in question by Valls y Lorente SL (hereinafter: Valls) was declared unlawful. By the agreement, Valls undertook to pay Mr. Olaso Valero severance pay and compensation for illegal dismissal. The employee agreed to this.

Since Valls failed to pay the amounts due under that obligation on the agreed date, the Valencia Court of First Instance issued a judgment on 10 February 2000 declaring that obligation enforceable. Subsequently, Mr. Olaso Valero requested payment of the guaranteed amounts from Fogasa, which Fogasa rejected by decision of 30 October 2001. As regards the compensation for unfair dismissal, Fogasa argued that the amounts claimed were agreed in an agreement and were therefore not awarded by a court decision, a decision of the competent agency or a supplementary court decision under Article 14 II of Royal Decree No 505/85. Furthermore, the Valencia Court dismissed Mr. Olaso's action Valero against the aforementioned Fogasa decision by a judgment of 20 March 2003.

Superior Court of the Community Valenciana, which ruled on the appeal, referred the question to the CJEU as to whether the compensation claimed for unlawful dismissal falls within the scope of Directive 2002/74/EC. The CJEU answered the question posed by stating that it is for the national court to determine whether the term "remuneration", as defined in national law, also includes compensation for unlawful dismissal.[27]

Furthermore, the CJEU ruled that claims for compensation for unlawful dismissal, established in a conciliation procedure, such as the procedure described above, must be considered as remuneration within the meaning of Directive 80/987/EEC if, under the relevant national law, such claims fall within the term ”pay”.[28]

Therefore, claims established in conciliation proceedings, such as those in the main proceedings, must be regarded as claims relating to workers’ remuneration arising from contracts or employment relationships within the meaning of Directive 80/987 if, under the relevant national legislation, claims for

[27] See CJEU, judgment of 16.12.2004, case C-520/03, *Valero / Fondo de Garantía Salaria*, in ECR 2004, p. 12117, paragraph 33.
[28] See CJEU, judgment of 16.12.2004, case C-520/03, *Valero / Fondo de Garantía Salaria*, in ECR 2004, p. 12117, point 37.

compensation for unlawful dismissal awarded by a judicial or administrative decision fall within the concept of 'pay'. The national court must disapply any national legislation which, in breach of the principle of equality, excludes such claims from the concept of 'pay'.[29]

2. 4. Scope of the Directive on the protection of employees in the event of the insolvency of their employer

In the case of Cordero Alonso versus Fondo de Garantía Salarial (FOGASA), the CJEU clarified the protection of workers in the event of the insolvency of their employer. Mr. Cordero Alonso sought payment of compensation for the termination of his employment contract from the Spanish guarantee fund after his employer became insolvent. The problem was that the Spanish legislation at the time excluded certain types of compensation (those established by judicial agreement) from payment by the guarantee fund, unlike those established by a court decision.

Thus, since Mr. Cordero Alonso was dismissed for objective reasons, he contested that dismissal, which ultimately led to a settlement with the defendant. Since the employer did not voluntarily pay the debts agreed in the agreement, Mr. Cordero Alonso initiated enforcement proceedings, as a result of which the employer was declared insolvent on 24 April 2003, due to lack of assets. Mr. Cordero Alonso therefore requested payment of the outstanding debts from Fogasa. Fogasa paid him 40% of the severance pay in accordance with the agreement, but refused to cover the remaining 60%, arguing that the severance pay had been granted by agreement and not by a court or administrative decision. Subsequently, Mr. Cordero Alonso brought proceedings against Fogasa before the Palencia Social Court, seeking payment of the outstanding balance. This court dismissed the action, arguing that Fogasa was legally obliged to pay compensation payments for the termination of employment contracts only if these payments were granted by a court decision or an administrative decision and not if they were agreed by the parties in an amicable settlement. Mr. Cordero Alonso challenged this judgment before the Superior Court of Justice of Castile and León, which referred several questions to the CJEU concerning the effects of the primacy of EU law and, in particular, its power to disapply a national law that conflicts with EU law. In particular, the aforementioned court requested clarification as to whether the obligation of the Member States to take all appropriate measures, whether general or specific, to fulfil the obligations arising from the EC Treaty or from acts of the Community institutions (Article 10 EC), as well as the principle of the primacy of Community law over national law, considered in isolation and in the absence of explicit national provisions, allow national courts to disregard any national provisions of any kind which conflict with Community law, regardless of their rank in the hierarchy of rules.

The Court ruled that Member States cannot treat workers in comparable situations differently

[29] See CJEU, judgment of 16.12.2004, case C-520/03, *Valero / Fondo de Garantía Salaria*, in ECR 2004, p. 12117, paragraph 38.

solely on the basis of the way in which their claim was established (by agreement or by judgment), if both are of the same nature as compensation for loss of employment, confirming that the provisions of Directive 80/987/EEC (on the protection of workers in the event of insolvency) are sufficiently precise to be relied on directly by citizens before national courts against public bodies (such as FOGASA).[30] Therefore, in the view of the CJEU, Member States are free to cap payments, but they cannot introduce arbitrary exclusions that undermine the social purpose of the directive.

3. Conclusion

The analysis of Directive 2008/94/EC and the corresponding CJEU jurisprudence demonstrates that the European protection of wage claims in the event of employer insolvency is a fundamental mechanism for ensuring social stability within the internal market. The research highlights that while Member States retain a degree of discretion in defining the term "worker" and setting payment ceilings, this autonomy is strictly limited by the social objectives of the Directive.

A key finding of this study is the reinforcement of the principle of State liability, as established in the *Francovich* case, which serves as a vital sanction against the late or incorrect transposition of social directives. Furthermore, the analysis of the *Valero* and *Cordero Alonso* cases confirms that the principle of equality prohibits Member States from creating arbitrary distinctions between claims established by judicial decisions and those resulting from amicable settlements. Such exclusions are deemed incompatible with EU law, as they undermine the minimum protection guaranteed to employees.

In conclusion, the effective protection of employees during insolvency depends on a uniform application of these rules, ensuring that guarantee institutions fulfil their role regardless of the procedural manner in which a claim was established. This legal framework not only secures outstanding remuneration but also upholds the primacy of EU law and the principle of non-discrimination across all Member States.

References

I. European Legislation

- **Directive 2008/94/EC** of the European Parliament and of the Council of 22 October 2008 on the protection of employees in the event of the insolvency of their employer (Codified version), published in OJ L 283, 28.10.2008.

[30] See CJEU, judgment of 07.09.2006, case C 81/05, *Alonso1R*, in ECR 2006, p. 7569, paragraph 43.

- **Directive 80/987/EEC** on the approximation of the laws of the Member States relating to the protection of employees in the event of the insolvency of their employer, published in OJ L 283, 20.10.1980 (repealed).

II. Case Law of the Court of Justice of the European Union (CJEU)

- **Case C-6/90 and C-9/90**, *Francovich and Bonifaci v Republic of Italy*, Judgment of 19 November 1991, ECR 1991, p. I-5357.
- **Case C-479/93**, *Francovich v Italian Republic*, Judgment of 9 November 1995, ECR 1995, p. I-3843.
- **Joined Cases C-19/01, C-50/01 and C-84/01**, *Instituto nazionale della previdenza sociale (INPS) v Alberto Barsotti and Others*, Judgment of 4 March 2004, ECR 2004, p. I-2005.
- **Case C-520/03**, *José Vicente Olaso Valero v Fondo de Garantía Salarial (Fogasa)*, Judgment of 16 December 2004, ECR 2004, p. I-12117.
- **Case C-81/05**, *Anabel Cordero Alonso v Fondo de Garantía Salarial (Fogasa)*, Judgment of 7 September 2006, ECR 2006, p. I-7569.

Legal protection of employees in the event of collective redundancies - an analysis of the rules of the European directive in the light of the CJEU case law

Sergiu-Cătălin OLTEANU[31]

Abstract

This article analyses the European rules established by Directive 98/59/EC for the protection of employees during collective redundancies, highlighting the essential role of the Court of Justice of the European Union (CJEU) in their interpretation. The primary purpose of this research is to evaluate the effectiveness of procedural safeguards in preventing arbitrary employment terminations. This study aims to clarify how judicial interpretations ensure a fair balance between the employer's operational freedom and the workers' fundamental right to information and consultation. Furthermore, the research seeks to identify the legal consequences of failing to observe these mandatory prior consultations.

The methodology involves a qualitative analysis of European legislation and a systematic review of landmark CJEU decisions. Through the *Rockfon* case, the research clarifies the autonomous notion of "establishment," preventing companies from avoiding legal procedures through administrative fragmentation. Another major contribution, identified in the *Junk* case, establishes that the written notice of dismissal constitutes the actual legal event of dismissal, requiring the mandatory completion of all consultations prior to this moment. Finally, the analysis highlights that these protection rules remain valid even during insolvency or the termination of activity by unilateral decision, according to the *Goodyear Hellas* case. In conclusion, the study emphasizes that a uniform application of these social standards is crucial for preventing the migration of companies to states with more permissive regulations, thereby ensuring a high level of worker protection across the European Union.

Keywords: Directive 98/59/EC, collective redundancies, consultation and information, CJEU case law, employment stability.

JEL Code: K31

The European Union has established minimum standards for the protection of employees in the context of collective redundancies.

This article presents the provisions of the European directive on collective redundancies and the

[31] Sergiu-Cătălin Olteanu is an assistant professor at the Faculty of Law of Bioterra University, Bucharest, and holds a doctorate in law from the Faculty of Legal Sciences of the University of Osnabrück, Germany, sergiu.olteanu@bioterra.ro, ORCID ID: 0009-0006-5672-8430,

relevant case law of the Court of Justice of the European Union (CJEU) on the matter.

1. Presentation of the Directive on collective redundancies

Before the adoption of Directive 98/59/EC of 20 July 1998 on the approximation of the laws of the Member States relating to collective redundancies[32], the European legislator was faced with the following dilemma: European corporations with several subsidiaries in several Member States of the European Community issued collective redundancies only in those Member States where the legal costs and the costs related to the redundancies (severance pay, legal costs, etc.) were the lowest due to the lower standards of protection of labour law, so that a higher protection of employees guaranteed by a particular Member State could work against it. European companies deliberately chose the Member States where employees were least protected from the point of view of labour law.

Directive 98/59/EC on collective redundancies was adopted, which obliges employers to consult employees' representatives in the event of collective redundancies. The Directive specifies in detail what points must be taken into account during these consultations and what information the employer must provide. In addition, the Directive defines the procedure and modalities for collective redundancies.

The scope of the provisions on the conduct of collective dismissal procedures may vary, as the directive allows each Member State to define the terms "employee" and "employer" as it sees fit.[33]

The material scope depends on the occurrence of a specific number of collective redundancies. These must be redundancies for objective reasons, taking place either over a period of 30 days, in which the number of employees affected is fixed in absolute terms or as a percentage of the size of the company, or over a period of 90 days, during which at least 20 employees are made redundant. Member States have the option of choosing between these two options.

If an employer intends to carry out collective redundancies, it must consult with employee representatives. These consultations must at least cover the possibility of avoiding or limiting collective redundancies, as well as mitigating their consequences, in particular through social support measures providing assistance for the redeployment or retraining of the dismissed employees.

The employer's obligation to provide information includes the following aspects: the reasons for collective redundancies, the period in which the redundancies are to be carried out, the number of employees normally employed, the number of employees to be made redundant, the criteria selected for the employees to be made redundant and the method of calculating any compensation payments.

[32] This directive is a codified version of Directives 75/129/EEC and 92/56/EEC which were repealed by it (published in OJ L 225 of 12.8.1998).

[33] Employees employed for a specific period or activity, as well as those employed in the public sector, are excluded from the application of the provisions of the directive. In addition, employees of public administrations or institutions and members of the crews of seagoing vessels are also exempted.

In addition, the aforementioned directive obliges the employer to inform the competent authority of all planned collective redundancies. The notification must contain all relevant information about the planned collective redundancies and consultations, but not the method of calculating compensation payments. In the case of closure of the activity following a court decision, this must be reported to the competent authority only at its request.

In addition, the employer must send a copy of the notification to the employees' representatives so that they can address any relevant observations to the competent authority.

Collective redundancies shall take effect no later than 30 days after receipt of the notification. Member States may allow the competent authority to extend this period to 60 days from the date of receipt of the notification if the problems cannot be resolved. This provision does not necessarily apply to collective redundancies resulting from the cessation of activity following a court decision. Further extensions may also be granted, but in such cases the employer must be notified of any extension and the reasons for it must be communicated before the expiry of the initial period.

2. Presentation of the CJEU case law on collective redundancies

In the following, we will present several cases with European relevance that we consider useful for understanding the issue of employee protection in the event of collective dismissals, namely: *Dansk*[34], *Goodyear Hellas* [35], *Rockfon*[36] and *Junk.*[37]

2.1. Resignation

Before filing for bankruptcy, H. Nielsen & Son, Mask Factory, informed its employees of the impending insolvency. H. Nielsen & Son, Mask Factory, did not provide any guarantee regarding the payment of salaries. For these reasons, the employees permanently terminated their employment contracts with H. Nielsen & Son, Mask Factory, and resigned.

In this case, the CJEU did not equate the "self-resignation" of employees in the context of the employer's insolvency with a dismissal by the employer. [38]It justified its decision by stating that the employer is obliged to consult the employees' representatives in advance and to notify the competent authority in advance of the planned dismissals. [39]This objective cannot be achieved if the employees

[34] See CJEU, judgment of 12 February 1985, case C-284/83, in ECR 1985, p. 553.
[35] See CJEU, judgment of 7 September 2006, Joined Cases C-187/05-C-190/05, ECR 2006, p. 535.
[36] See judgment of the CJEU of 7 December 1995, case C-449/93, in ECR 1995, p. 4291.
[37] See judgment of the CJEU of 27 January 2005, case C-188/03, in ECR 2005, p. 885.
[38] See judgment of the CJEU of 12 February 1985, case C-284/83, in ECR 1985, p. 553, paragraph 11.
[39] See the judgment of the CJEU of 12 February 1985, case C-284/83, in the 1985 ECR, p. 553, paragraph 10.

themselves prevent a collective dismissal by their employer by submitting their own resignations.[40]

2.2. Collective layoffs after insolvency

The following relevant case arises in the context of disputes between dismissed workers and their former employer regarding the legality of collective dismissals which affected the workers concerned, following the employer's decision, on its own initiative, to cease its activity.

The plaintiffs in the original action work under permanent employment contracts at the Goodyear manufacturing plant. Hellas SA from the industrial area of Thessaloniki.

The operations of this plant were separate and economically independent from the company's commercial branch located in Athens. On July 19, 1996, the shareholders' meeting of the United States parent company, Goodyear, decided to cease production and permanently close the Thessaloniki plant as of July 22, 1996. The employment contracts of the approximately 340 employees in the company's production branch were terminated without complying with the regulations and procedures applicable at the time.

The dismissed employees brought legal actions for unfair dismissal, which were dismissed both at first instance and on appeal. Those courts considered that the employer was not subject to its obligations under Directive 75/129/EEC and the national transposition provisions, since Greek law does not provide for a court decision prior to the employer's unilateral decision to definitively cease the activities of the company or establishment, which would open insolvency proceedings.

The CJEU ruled that the provisions of Directive 75/129/EEC apply to collective redundancies even if national legislation does not provide for the need for a court decision prior to the definitive cessation of the activity of the undertaking or establishment exclusively at the initiative of the employer.[41]

2.3. Definition of establishment in the Collective Redundancies Directive

In the "*Rockfon*" case[42], the CJEU provided a crucial interpretation for the protection of workers, defining what exactly an "establishment" means in the context of collective redundancies.

The ICEU has established that a "unit" must be interpreted as the entity to which workers are assigned to carry out their tasks. It is not necessary for it to have legal, economic, financial or administrative autonomy from the rest of the company.

The interpretation of the term "unit" in a broad sense aims to ensure that as many workers as

[40] See the judgment of the CJEU of 12 February 1985, case C-284/83, in the 1985 ECR, p. 553, paragraph 17.
[41] See CJEU, judgment of 7 September 2006, joined cases C-187/05-C-190/05, in ECR 2006, p. 535, paragraph 45.
[42] See the judgment of the CJEU of 07.12.1995, case C-449/93, in the 1995 ECR, p. 4291, point 22.

possible benefit from the protection of Directive 98/59/EC, preventing situations where employers could avoid reporting thresholds by fictitious fragmentation of the company EUR-Lex C-449/93.

The Court stressed that the fact that the decision to carry out collective redundancies is taken by a central structure (e.g. the head office or a parent company) does not change the status of the local entity as an "establishment". This ruling is directly relevant as it clarifies the spatial and organisational boundaries within which the number of redundancies is calculated.

Thus, the CJEU ruled that two or more interconnected companies within a group, none of these having a decisive influence on the other company or companies, they are not prevented from setting up a joint body for recruitment and dismissals, so that, in particular, redundancies in one of the companies may take place only with the agreement of that body.[43] Furthermore, the CJEU added that the term 'establishment' within the meaning of Art. 1(1)(a) of Directive 75/129/EEC refers to an entity to which the workers affected by the redundancies belong for the purpose of carrying out their tasks. The fact that the entity in question has a management which can independently carry out collective redundancies is not decisive for the definition of the term 'establishment'.[44] The CJEU also declared that it is incompatible with EU law for companies belonging to the same group to make the application of the Collective Redundancies Directive more difficult by transferring the decision on redundancies to a separate body at group level. In this way, they could avoid the obligation to comply with certain procedures for the protection of workers, and larger groups of workers could be denied the right to information and consultation to which they would normally be entitled under the directive.

2.4. Notice of dismissal as the moment of "dismissal"

In the latter case, the question is whether the application of the provisions on the protection of employees in the event of collective redundancies is to be assessed, namely whether this date is calculated from the date of notification of the intention to redundancies or from the date on which the employment contracts have already ended. Thus, the Berlin Employment Court referred a question to the CJEU concerning the interpretation of Articles 1 to 4 of Directive 98/59/EC in the context of a dispute between Ms. Junk and the insolvency administrator of a company.

The applicant was employed as a nurse at the AWO Gemeinnützige-Pflegegesellschaft Southwest GmbH (hereinafter referred to as: AWO). Due to payment difficulties, AWO filed for insolvency on 31 January 2002.

By letter of 27 June 2002, the receiver dismissed the applicant for operational reasons, with effect from 30 September 2002. The applicant contested that dismissal by bringing an action before the Berlin

[43] See the judgment of the CJEU of 07.12.1995, case C-449/93, in the 1995 ECR, p. 4291, point 22.
[44] See the judgment of the CJEU of 07.12.1995, case C-449/93, in the 1995 ECR, p. 4291, point 32.

Regional Court on 17 July 2002. On 27 August 2002, the receiver notified the Employment Agency of the dismissal of all remaining employees, with effect from 30 September 2002.

According to the Berlin District Court, the outcome of the dispute depends on whether the dismissal in question is invalid due to a breach of the collective dismissal regulations. According to the prevailing view, the collective dismissal regulations are not relevant to the date of the dismissals themselves, but rather to the date of the employees' actual departure from the company upon expiry of the notice periods.

Since the Berlin employment court considered that the term ‘dismissal’ within the meaning of the Collective Redundancies Directive should be interpreted as synonymous with dismissal by the employer, it asked the CJEU whether the provisions of the Collective Redundancies Directive should be interpreted as meaning that the notification of dismissal by the employer is the event constituting a dismissal. In addition, the Berlin Court asked the CJEU whether the employer may carry out collective redundancies before the consultation and notification procedures have been completed.

The CJEU answered the questions raised by stating that the provisions of the Directive on collective redundancies must be interpreted as meaning that the notice of dismissal is the event considered as a dismissal and that collective redundancies may be carried out after the consultation procedure has been concluded and after the notification of the intended collective redundancies.[45]

3. Conclusion

The analysis of Directive 98/59/EC and the corresponding jurisprudence of the Court of Justice of the European Union demonstrates that the protection of employees in the event of collective redundancies is a fundamental pillar of the European social model. The directive does not merely impose procedural hurdles; it establishes a mandatory framework for social dialogue intended to mitigate the impact of industrial restructuring.

The research highlights the crucial role of the CJEU in preventing the circumvention of these social standards. By defining the "establishment" in a broad, functional sense (*Rockfon*), the Court has ensured that employers cannot avoid their obligations through artificial corporate fragmentation. Furthermore, the *Junk* ruling provides a vital temporal safeguard, clarifying that the legal event of "dismissal" occurs at the moment of notification, thus requiring all consultations and information procedures to be fully completed beforehand. The *Goodyear Hellas* case further reinforces this protection by confirming that the Directive’s safeguards apply even when a business closure is a result of a unilateral employer decision rather than a court-ordered insolvency.

[45] See CJEU, judgment of 27 January 2005, case C-188/03, *Junk*, in ECR 2005, p. 885, paragraph 39.

In conclusion, these judicial interpretations ensure that the employer's operational freedom is balanced against the workers' right to information and consultation. Maintaining uniform application of these rules across Member States is essential to prevent social dumping and to guarantee that the internal market operates on a foundation of legal certainty and high-level worker protection.

References

I. European Legislation

- **Council Directive 98/59/EC** of 20 July 1998 on the approximation of the laws of the Member States relating to collective redundancies, published in OJ L 225, 12.8.1998.
- **Council Directive 75/129/EEC** of 17 February 1975 on the approximation of the laws of the Member States relating to collective redundancies (repealed).
- **Council Directive 92/56/EEC** amending Directive 75/129/EEC on the approximation of the laws of the Member States relating to collective redundancies (repealed).

II. Case Law of the Court of Justice of the European Union (CJEU)

- **Case C-284/83**, *Dansk Metalarbejderforbund and Specialarbejderforbundet i Danmark v H. Nielsen & Søn, Maskinfabrik A/S, in liquidation*, Judgment of 12 February 1985, ECR 1985, p. 553.
- **Case C-449/93**, *Rockfon A/S v Specialarbejderforbundet i Danmark*, Judgment of 7 December 1995, ECR 1995, p. I-429.
- **Case C-188/03**, *Irmtraud Junk v Wolfgang Kühnel*, Judgment of 27 January 2005, ECR 2005, p. I-885.
- **Joined Cases C-187/05 to C-190/05**, *Agapiou Joséphine v Goodyear Hellas SAI*, Judgment of 7 September 2006, ECR 2006, p. I-535.

Protection of employees in the event of a transfer of the undertaking - an analysis of the rules of the European directive in the light of the CJEU case law

Sergiu-Catalin OLTEANU[46]

Abstract

This article analyses the European legal framework protecting employees during the change of ownership of an economic unit, focusing on Directive 2001/23/EC and the jurisprudence of the Court of Justice of the European Union (CJEU). The primary purpose of this research is to evaluate the effectiveness of current social protections in maintaining employment stability during corporate restructuring. It aims to clarify the legal boundaries of a "transfer of undertaking" to prevent the circumvention of workers' rights through outsourcing or fragmentation. Furthermore, the study seeks to highlight the mandatory nature of information and consultation obligations for all parties involved.

The methodology involves a qualitative analysis of European legislation and a detailed examination of CJEU case law. The research explains how the law obliges new owners to assume all rights and obligations from existing contracts, prohibiting dismissals based solely on the transfer. A significant section is dedicated to landmark cases, such as *Christel Schmidt*, demonstrating that protection applies even to outsourced services involving a single employee.

The findings indicate that effective protection is rooted in maintaining the link between production factors that allow an economic activity to continue under new management. In conclusion, the study emphasizes that Member States cannot exclude employment relationships from the Directive's scope based on working hours, ensuring a high level of protection across the European Union.

Keywords: Directive 2001/23/EC, CJEU case law, employee protection, transfer of undertaking, labour law.

JEL Code: K31

The European Union has established minimum standards for the protection of employees in the context of business transfers, collective redundancies and business insolvency.

This article will present the provisions of the European directive on the protection of employees in the event of a transfer of undertaking and the relevant case law of the Court of Justice of the European Union (CJEU) on the matter.

1. Presentation of the directive on the protection of employees in the event of a transfer of undertakings

Directive 2001/23/EC of 12 March 2001 on the approximation of the laws of the Member States

[46] Sergiu-Cătălin Olteanu is an assistant professor at the Faculty of Law of Bioterra University, Bucharest, and holds a doctorate in law from the Faculty of Legal Sciences of the University of Osnabrück, Germany, sergiu.olteanu@bioterra.ro, ORCID ID: 0009-0006-5672-8430,

relating to the safeguarding of employees' rights in the event of transfers of undertakings, businesses or parts of businesses or undertakings[47] intends to protect employees during a change of ownership, in particular to ensure that their rights are protected. The transfer of an undertaking does not constitute a valid reason for dismissal by the employer. However, dismissals are permitted for economic, technical or organisational reasons or for certain groups of employees who do not benefit from dismissal protection.

According to the provisions of that Directive, the rights and obligations arising from an employment contract existing at the time of the transfer of the undertaking shall be transferred to the transferee (or purchaser). Member States may provide that, after the date of the transfer, both the transferor (or seller) and the transferee are jointly and severally liable for the obligations arising before the date of the transfer from an employment contract existing at the time of the transfer of the undertaking.

In accordance with the provisions of art. 3 paragraph (3) of the Directive 2001/23/EC , the buyer of the business must maintain the working conditions agreed in a collective labour agreement to the same extent as they were provided for in the collective labour agreement for the seller of the enterprise until the termination or expiry of the collective labour agreement or until another collective labour agreement enters into force or is applied.

Where the employment contract is terminated because the transfer, within the meaning of the directive, results in a substantial change in the terms and conditions of employment, it is presumed that the termination of the employment contract was carried out by the employer (art. 4 para. (2) Directive 2001/23).

Unless Member States provide otherwise, the above provisions shall not apply where bankruptcy proceedings or similar proceedings aimed at the liquidation of the seller's assets have been opened against the seller, under the supervision of a competent public authority.

In addition, it is stipulated that both the seller and the buyer are obliged to inform their employee representatives in due time of the date or planned date of the transfer, the reasons for the transfer and the legal, economic or social consequences of the envisaged measures.

Subsequently, both the seller and the buyer are obliged to inform their employee representatives in good time so that an agreement can be reached. This applies regardless of whether the transfer was decided by the employer itself or by a company that controls the employer.

Finally, the Transfer of Undertakings Directive aims to maintain the representation and protection of the persons concerned affected by the transfer. Therefore, the legal status and function of the transferred workers' representatives, as provided for in the national law of the Member States, must be

[47] Directive 2001/23/EC of 12 March 2001 on the approximation of the laws of the Member States relating to the safeguarding of employees' rights in the event of transfers of undertakings, businesses or parts of undertakings or businesses combines Directive 77/187/EEC and Directive 98/50/EC, as amended (OJ L 61, 5.3.1977, p. 26 et seq.).

maintained, provided that the transferred undertaking retains its identity. However, this provision does not apply if the conditions for the replacement of workers' representatives under national law are met. Where the mandate of the workers' representatives affected by the transfer ends as a result of the transfer, these representatives continue to be protected by the guarantees provided for by the laws, regulations or practices of the Member States.

In any case, Member States may adopt provisions more favourable to employees or may promote or allow collective agreements and other agreements concluded between social partners which are more favourable to employees.

Member States are prohibited from excluding employment contracts and employment relationships from the scope of the directive solely because only a certain number of working hours are performed or are to be performed.

2. Presentation of the CJEU case law on the protection of workers in the event of a transfer of undertakings

Below we will present some relevant cases regarding the protection of workers during a transfer of an undertaking, namely: *Christel Schmidt* [48], *Ayse Suzen* [49], *Carlito Abler*[50], *Güney-Görres*[51], *Klarenberg.*[52]

In all these cases, the CJEU had to address the question of whether the award of a service contract to a new provider constitutes a transfer of an undertaking within the meaning of the undertaking in question.

2.1. Definition of transfer of undertaking within the meaning of Directive 77/187/EEC

In the case of *Christel Schmidt* The Schleswig-Holstein Labor Court (LAG Schleswig-Holstein) referred several questions to the CJEU for a preliminary ruling under Article 177 EEC in a dispute between Ms Christel Schmidt and the Savings and Loans Association of the former municipalities of Bordesholm, Kiel and Cronshagen.

The questions concerned the interpretation of Directive 77/187/EEC, asking the CJEU to determine whether the contractual transfer of cleaning tasks to an external company can constitute a transfer of an undertaking within the meaning of Directive 77/187/EEC and whether this also applies

[48] See CJEU, judgment of 14 April 1994, case C-392/92, *Christel Schmidt*, in Neue Magazine for Arbeitsrecht (NZA) 1994, p. 545.
[49] See CJEU, judgment of 11 March 1997, case C-13/95, *Ayse Süzen*, AP, in NZA 1997, p. 433.
[50] See CJEU, judgment of 20.11.2003, case C-340/01, *Carlito Abler*, AP, in NZA 2003, p. 1385.
[51] See CJEU, judgment of 15 December 2005, case C-232, 233/04, *Güney-Görres*, in NJW 2006, p. 889.
[52] See CJEU, judgment of 12 February 2009, case C-466/07, *Klarenberg*, in NZA 2009, p. 251.

where the cleaning tasks were carried out by a single employee before the date of the transfer.

The Savings and Loans Bank dismissed Ms Schmidt due to renovations carried out at this branch. It intended to outsource the cleaning of this branch to the company Spiegelblank, which already cleaned most of the bank's buildings. Spiegelblank offered Ms Schmidt a higher monthly salary than she had previously received. However, Ms Schmidt was not willing to work under these conditions because, in her opinion, the significant increase in the area to be cleaned would actually lead to a decrease in her hourly wage. Ms Schmidt therefore lodged a complaint for protection against unfair dismissal, which was rejected at first instance. She then appealed to the competent employment tribunal in Schleswig-Holstein. The tribunal stayed the proceedings and requested a preliminary ruling from the CJEU.

The CJEU ruled that a transfer of an undertaking within the meaning of the relevant European directive takes place even if only a function previously performed by a single employee is contractually transferred to another employer. Since Ms Schmidt's transfer to the cleaning company thus constituted a transfer of an undertaking within the meaning of Article 1 of Directive 77/187/EEC, the CJEU confirmed the prohibition on dismissal.[53]

Therefore, Ms Schmidt's former employer was not entitled to terminate Ms Schmidt's employment relationship upon the transfer of the cleaning work to the cleaning company.

2.2. Transfer of business and reassignment of cleaning services

In the case of „*Ayse Süzen*" The Bonn Court of Appeal referred several questions to the CJEU on the interpretation of Directive 77/187/EEC for a preliminary ruling under Article 177 of the EC Treaty in a dispute between Ayse Süzen and Zehnacker Building cleaning GmbH Krankenhausservice. The plaintiff was employed by the defendant, whose college in Bonn- Bad Godesberg, namely the Aloisiuskolleg, had awarded him a contract to provide cleaning services.

After the college terminated the contract, the defendant dismissed the plaintiff and seven other employees who had been responsible for cleaning the school. Aloisius College subsequently awarded the cleaning contract to Lefarth GmbH.

The applicant brought an action before the Bonn District Court, seeking a ruling that her employment relationship with the defendant had not ended by dismissal.

Since the General Court considered that the interpretation of the directive was relevant to the resolution of the dispute, it stayed the proceedings and referred the preliminary question on the applicability of Directive 77/187/EEC to the CJEU.

The CJEU ruled that the provisions of the Transfer of Undertakings Directive are not applicable

[53] See CJEU, judgment of 14 April 1994, case C-392/92, *Christel Schmidt*, NZA 1994, p. 546, paragraph 20.

where a client who has outsourced the cleaning of premises to a contractor terminates the contract with that contractor and concludes a new contract with another contractor to carry out similar work, provided that this process does not involve a transfer of relevant tangible or intangible assets from one contractor to another nor the transfer to the other contractor of a substantial part of the number and expertise of the staff employed by the first contractor to perform the contract.[54]

2.3. Change of contractor as transfer of undertaking

The Vienna District Court has asked the CJEU several questions regarding the interpretation of the term "transfer of an undertaking" in the context of a dispute between Carlito Abler and others/ Sodexo.

In the present case, an Austrian hospital had discontinued its kitchen and canteen activities and had outsourced these services to a catering company (Sanrest). The hospital provided the necessary premises and equipment, such as the kitchen and dining rooms, for the preparation of meals. Other necessary resources, such as water and energy, were also provided by the hospital to the service provider. Sanrest was contractually obliged to take care of the delivery and supply of food and drinks as well as the catering services within the hospital, consisting of the full care of patients and hospital staff. The preparation of the food was to take place at the company's premises.

Sanrest's duties included creating menus, purchasing, storing, producing, portioning, and transporting portioned meals to the various wards of the hospital, distributing them to the staff dining room, and cleaning dirty dishes and used rooms.

Following disagreements between Sanrest and the hospital operator, the latter terminated the contract on 26 April 1999 and awarded the contract to another company, Sodexho.

Sodexho is responsible not only for cleaning dirty dishes and used rooms, but also for replacing any damaged inventory. Sodexho did not take over supplies, menus, diet plans, recipes, or cost calculations from its predecessor. Sodexho also did not hire Sanrest 's 21 employees, but operated the kitchen and cafeteria with its own staff.

Sanrest employees claimed that their employment relationships had been transferred to Sodexho. In response to their lawsuit, the competent social and labor court denied the existence of a transfer of undertaking, emphasizing that Sodexho, as the new catering service provider, ultimately took over "only the task of cooking for the hospital in the premises provided."

In the appeal proceedings, the Vienna Court of Appeal took the opposite view, considering that, in the present case, there had been a transfer of an undertaking, since an economic entity which retained its identity, characterised by the exercise of its activity and by its existing means of operation and premises, had been transferred.

[54] See CJEU, judgment of 11 March 1997, case C-13/95, *Ayse Süzen*, NZA 1997, p. 434.

In this context, the General Court decided to stay the proceedings and to ask the CJEU whether there was a transfer of an undertaking within the meaning of the European directive in this case. The CJEU ruled that the provisions of the Transfer of Undertakings Directive apply to a situation in which a customer who has contractually entrusted to a first company the entire activity of providing catering services in a hospital terminates that contract and concludes a new contract for the same services with a second company, provided that the second company uses essential tangible assets previously used by the first and successively made available to both by the customer.[55]

2.4. Use of operational resources for own economic purposes

The request for a preliminary ruling is made in the context of the disputes between Ms Güney-Görres and Ms Demir, on the one hand, and Kötter, on the other. Aviation Security GmbH & Co. KG, and the former employer of Ms Güney-Görres and Ms Demir, namely Securicor Aviation Ltd, on the other hand. The aforementioned employees brought an action before the Düsseldorf Employment Court against Kötter, seeking a declaratory judgment declaring that the previously existing employment relationship between them and Securicor had not ended but was in fact continuing with Kötter, pursuant to Section 613a of the German Civil Code (BGB), which is the German provision transposing the relevant European directive. Ms. Güney-Görres and Ms Demir were employed by Securicor on a permanent contract as security officers responsible for passenger and baggage screening at Düsseldorf Airport.

Following the conclusion of the respective contract, Securicor Aviation Defence International Germany Ltd. was entrusted with the security screening of passengers and baggage at Düsseldorf Airport. Securicor was further entrusted with the execution of the contract. According to the terms of the contract, the Federal Republic of Germany provided Securicor with the aviation security equipment necessary to carry out the security screening of passengers. Securicor also employed additional staff after they had been trained and tested.

Kötter intended to employ only a few of the existing employees of Securicor. Securicor therefore terminated the employment contracts of Ms. Güney-Görres and Ms. Demir. It also terminated the employment contracts of all other employees working on behalf of the Federal Republic of Germany.

Securicor subsequently ceased to perform the security screening tasks at Düsseldorf Airport, which had been delegated to it by the Federal Republic of Germany. From 1 January 2004, Kötter carried out passenger and baggage screening at the airport, on the basis of a contract with the Federal Republic of Germany. Kötter used the air security equipment owned by the Federal Republic of Germany. At the same time, Kötter took over 167 employees previously employed by Securicor, but not Ms. Güney-Görres and Ms. Demir, who brought an action for unfair dismissal before the Düsseldorf District Court.

[55] See CJEU, judgment of 20 November 2003, case C-340/01, *Carlito Abler*, NZA 2003, p. 1387, point 43.

The Düsseldorf court in turn asked the CJEU whether EU law allows the assumption of a transfer of operational resources to be made conditional on their use for the customer's own economic purposes. The CJEU considered that this equipment was not used for the customer's own economic purposes, since its maintenance was the responsibility of the Federal Republic of Germany, as the contracting authority, which was to bear the costs. Furthermore, the contractors concerned had no possibility of using this equipment for their own economic purposes. They could not derive any additional economic benefit from it and could not determine the nature and extent of its use. Furthermore, the specifications provided for the obligation to use this equipment.

In response to the question posed, the CJEU stated that, when examining whether there has been a transfer of an undertaking or activity in the event of the award of a new contract, establishing whether the operating resources were made available for the new contractor's own economic use is not a necessary condition for determining whether those resources were transferred from the original contractor to the new contractor, and, therefore, whether the provisions of the European directive on the protection of employees in the event of transfers of undertakings are applicable.[56]

2.5. Transfer of the enterprise despite the lack of organizational independence

The last case we will present was in the context of a dispute between Mr. Klarenberg and Ferrotron Technologies GmbH. A request was made regarding the interpretation of the directive on the transfer of undertakings despite the lack of organizational independence.

Mr. Klarenberg, employed by ET Electrotechnology GmbH on 1 January 1989, brought an action before the Wesel District Court to have his employment relationship with Ferrotron not terminated. An agreement entitled "Sales and Purchase Agreement for Assets and Businesses" was concluded between ET Electrotechnology GmbH, on the one hand, and Ferrotron Technologies GmbH and Ferrotron 's parent company, on the other. Under this agreement, the parent company acquired from Ferrotron all rights to the software, patents, patent applications relating to inventions relating to the products in question and technical know-how. Ferrotron acquired from ET the development hardware, the inventory of materials for the products and a list of related suppliers and customers.

Wesel District Court dismissed the action, considering that the provisions of the European Directive on the matter were not applicable. Mr Klarenberg appealed the decision of the Wesel Labor Court to the higher court. Since the Labor Court considered that the transfer of the unit run by Mr Klarenberg constituted a transfer of an undertaking within the meaning of Art. 613a para. 1 sentence 1 of the German Civil Code (BGB), which, as we have stated, transposes the provisions of the European Directive on the matter, which took place as a result of the acquisition by Ferrotron of essential tangible

[56] See CJEU, judgment of 15 December 2005, case C-232, 233/04, *Güney-Görres*, NJW 2006, p. 891.

assets, the related list of customers and suppliers and the transfer of some of the know-how holders employed in that part of the business, as well as the acquisition of the rights to essential products and technologies by the parent company, it referred the present case to the CJEU as to whether the present case constitutes a transfer within the meaning of Directive 2001/23/EC.

The CJEU answered the question in the affirmative and ruled that the identity of the economic unit must be understood as the maintenance of the link between the factors of production. This link between the factors of production is characterized by the fact that it allows the acquirer, despite integration into a new organizational structure, to carry out the same or similar economic activities.[57]

The CJEU further stated that, in the event of a transfer of an economic entity, effective protection of workers' rights must be ensured. Therefore, confirmation of the existence of a transfer is both necessary and possible, even if the organizational unit is not maintained during the transfer of factors of production. A contrary view would deprive workers of precisely this protection.[58]

3. Conclusion

The analysis of Directive 2001/23/EC and the extensive case law of the Court of Justice of the European Union reveals a consistent legal trajectory focused on the high-level protection of employees during corporate restructuring. From the landmark *Christel Schmidt* ruling to the complex *Klarenberg* decision, the CJEU has progressively broadened the definition of a "transfer of undertaking" to ensure that workers are not deprived of their rights through organizational fragmentation or outsourcing.

The research demonstrates that the safeguarding of employment relationships is not merely a formality but a mandatory principle. Whether the transfer involves a single employee in cleaning services or a complex integration of technological assets, the core legal requirement remains the same: the link between the factors of production must be maintained to allow the continuation of the economic activity under new management. Furthermore, the mandatory nature of information and consultation obligations for both transferors and transferees serves as a crucial safeguard against arbitrary dismissals.

In conclusion, European law successfully balances the economic freedom of the employer with the social stability of the worker. By prohibiting dismissals based solely on the grounds of ownership change and ensuring the automatic transfer of all rights and obligations, the European legal framework remains a cornerstone of social justice within the internal market.

References

[57] See CJEU, judgment of 12 February 2009, case C-466/07, *Klarenberg*, NZA 2009, p. 251, paragraph 52.
[58] See CJEU, judgment of 12 February 2009, case C-466/07, *Klarenberg*, NZA 2009, p. 251, paragraph 43.

I. European Legislation

- **Council Directive 2001/23/EC** of 12 March 2001 on the approximation of the laws of the Member States relating to the safeguarding of employees' rights in the event of transfers of undertakings, businesses or parts of undertakings or businesses, published in OJ L 61, 5.3.2001.
- **Council Directive 77/187/EEC** of 14 February 1977 on the approximation of the laws of the Member States relating to the safeguarding of employees' rights in the event of transfers of undertakings, businesses or parts of businesses (repealed).
- **Council Directive 98/50/EC** amending Directive 77/187/EEC on the approximation of the laws of the Member States relating to the safeguarding of employees' rights in the event of transfers of undertakings, businesses or parts of businesses (repealed).

II. Case Law of the Court of Justice of the European Union (CJEU)

- **Case C-392/92**, *Christel Schmidt v Spar- und Leihkasse der früheren Ämter Bordesholm, Kiel und Cronshagen*, Judgment of 14 April 1994, ECR 1994, p. I-131.
- **Case C-13/95**, *Ayse Süzen v Zehnacker Gebäudereinigung GmbH Krankenhausservice*, Judgment of 11 March 1997, ECR 1997, p. I-1259.
- **Case C-340/01**, *Carlito Abler and Others v Sodexho MM Catering Gesellschaft mbH*, Judgment of 20 November 2003, ECR 2003, p. I-14023.
- **Joined Cases C-232/04 and C-233/04**, *Güney-Görres and Demir v Securicor Aviation (Germany) Ltd and Kötter Aviation Security GmbH & Co. KG*, Judgment of 15 December 2005, ECR 2005, p. I-11237.
- **Case C-466/07**, *Dietmar Klarenberg v Ferrotron Technologies GmbH*, Judgment of 12 February 2009, ECR 2009, p. I-803.

The Role of Total Labour Force Participation in Economic Growth in Turkey

Hakan EYGU[59]

Abstract

The aim of this study is to evaluate the socio-economic factors affecting economic growth (GDP) and to analyze their impact on economic performance. The employer rate (E), labor force participation rate (LF), unemployment rate (UNE), and male and female labor force participation rate (FMP) were used as independent variables in this model. A Structural Equation Model was employed to measure the effects of these independent variables on economic growth. Both direct and indirect effects were identified in the study, and their significance was assessed. The analysis revealed that the employer rate and the overall labor force participation rate have a significant and positive impact on economic growth. It was also observed that the employer rate indirectly supports economic growth. In contrast, the male and female labor force participation rates emerged as factors negatively affecting economic growth. In this context, the study highlights the complex effects of labor dynamics and family involvement on economic performance. These findings emphasize the importance of considering the impact of labor force participation and measuring these effects when developing economic policies.

Keywords: Economic growth, Labor force participation, Socio-economic factors

JEL Code: J21, O40, C30

1. Introduction

Economic growth is a critical indicator in the process of increasing social welfare, raising income levels, and improving the quality of life in countries. In order to achieve and sustain economic growth, it is necessary to understand various economic and socio-demographic factors. In this context, variables such as the employer rate (E), total labor force participation rate (LF), unemployment rate (UNE), and male and female labor force participation rate (FMP) stand out as important components shaping economic growth. The aim of this study is to analyze the direct and indirect effects of these socio-economic factors on economic growth by using the Structural Equation Model (SEM).

Research on the determinants of economic growth emphasizes the importance of labor force participation, unemployment, and the contribution of family employers to the economy. The complex effects of labor market dynamics on economic performance provide valuable guidance for policymakers, particularly in developing sustainable growth strategies in developing countries. Variables such as the labor force participation rate (LF) are considered key factors affecting the growth rate and employment

[59] Prof. Dr. Hakan EYGU, Atatürk University, Faculty of Economics and Administrative Sciences, Department of Econometrics, hakaneygü@atauni.edu.tr, 535 594 5035, ORCID No: 0000-0002-4104-2363

potential of the economy. Similarly, factors such as the employer rate (E) can make both direct and indirect contributions to the economy by supporting entrepreneurship at local and national levels, thereby forming one of the cornerstones of economic growth.

The SEM used in this study is a powerful statistical method that allows the examination of complex relationships among multiple variables simultaneously. In this model, the employer rate (E), total labor force participation rate (LF), unemployment rate (UNE), and male and female labor force participation rate (FMP) were considered as independent variables, while economic growth (GDP) was modeled as the dependent variable. In addition, the mediating role of the labor force participation rate (LF) was examined in the model, and the effects of other socio-economic variables on economic growth through this variable were investigated. The use of SEM made it possible to identify both direct and indirect effects and to analyze the magnitude and direction of these effects.

The data used in this study cover the period from 1991 to 2023. However, instead of applying time series analysis, covariance-based SEM was preferred due to the small sample size. This methodological choice adds significant originality to the study. While time series analyses are generally used to examine dynamic relationships among variables over time, the use of SEM in this study allowed the simultaneous analysis of the direct and indirect effects of multiple independent variables on economic growth. Time series analysis mainly focuses on time-dependent trends and short- and long-term interactions among variables, whereas SEM is more suitable for revealing the complex interrelationships among variables and their indirect effects. In this context, the use of SEM enabled a more holistic evaluation of the various factors affecting economic growth, not only over time but also within the framework of their relationships with one another. This increased the complexity and explanatory power of the model and provided a more comprehensive analytical perspective.

The aim of the study is not to investigate temporal causality, but to examine the structural and simultaneous relationships among socio-economic variables. In this context, the study investigates the effects of variables such as labor force participation, unemployment rate, and family employer rate on economic growth. To achieve this objective, the following research questions were addressed: (i) Do the selected variables have not only direct effects but also indirect effects through variables such as labor force participation rate? (ii) What are the contributions of the employer rate, unemployment rate, and male and female labor force participation rate to economic growth? (iii) How are the direct and indirect effects of multiple independent variables on economic growth shaped simultaneously through the use of the Structural Equation Model? The findings obtained within this framework provide important implications for policymakers regarding how labor market dynamics shape economic growth and how these dynamics can be improved.

2. Literature

In examining the relationship between economic growth and various labor market indicators, it is essential to consider the family employer ratio (E), total labor force participation rate (LF), and unemployment rate (UNE) as independent variables. Economic growth, often measured by GDP, serves as the dependent variable in this analysis.

Research indicates (Natsır et al., 2024; Gunadi et al., 2025) that labor market dynamics significantly influence economic growth. Higher real wages may increase productivity and competitiveness; however, when economic growth is capital-intensive and does not generate sufficient employment opportunities, wages and poverty may be negatively associated with growth (Haider et al., 2023; Cruz, 2023). For instance, Nasir et al. highlight that labor force participation rates are critical determinants of economic growth across various countries, including those in the Asia-Pacific region (Nasir et al., 2021). This is corroborated by Chowdhury et al., who found that macroeconomic variables, including labor force participation, have a significant impact on economic growth in Bangladesh (Chowdhury et al., 2019). The total labor force participation rate (LF) is particularly important, as higher participation rates typically correlate with increased economic output, suggesting that a more engaged workforce can drive economic expansion (Nasir et al., 2021; Chowdhury et al., 2019).

The unemployment rate (UNE) also plays a crucial role in this relationship. According to Quy, there is a negative correlation between unemployment and economic growth (Kreishan, 2011), where higher unemployment rates tend to hinder economic performance (Quy, 2016). This aligns with the findings of Tenzin, who discusses Okun's Law, which posits that increases in economic growth are associated with decreases in unemployment rates (Tenzin, 2019). Furthermore, the study by Soylu et al. reinforces this notion by demonstrating that economic growth can lead to reductions in unemployment, thus supporting the argument that labor market conditions are pivotal for economic health (Soylu et al., 2018). In this context, improvements in employment opportunities and labor market efficiency may contribute not only to higher income levels (Mishra wet al., 2024) but also to enhanced social welfare and sustainable economic development.

The family employer ratio (E), which reflects the proportion of family-run businesses, can also influence economic growth. While specific studies on this variable are less prevalent, it is reasonable to infer that family businesses contribute to employment and economic activity, particularly in developing economies (Freeman, 1993) where such enterprises are prevalent. However, the direct impact of the family employer ratio on economic growth (Memili et al., 2015) requires further empirical investigation, as its effects may vary depending on labor market structures (Mincer, 1996), income distribution, and the overall level of economic development.

In summary, the interplay between the family employer ratio, total labor force participation rate,

and unemployment rate significantly affects economic growth. Empirical evidence suggests that higher labor force participation and lower unemployment rates are conducive to economic expansion, while the role of family businesses as employers adds another layer of complexity to this relationship. Future research should continue to explore these dynamics to inform policy decisions aimed at enhancing economic growth.

3. Method

In this section of the study, information is provided about the research model, the characteristics of the sample and population, data collection instruments, and data analysis.

3.1. Model and dataset

In the empirical section of the study, annual data covering the period 1991–2023 were used. The effects of the employer rate, unemployment rate, male and female labor force participation rate, and labor force participation rate on economic growth in Türkiye were investigated. In this section, the variables were standardized, and covariance-based SEM was preferred due to the small sample size. The variables included in the analysis and their descriptions are presented in Table 1.

Table 1. Veri seti ve açıklamaları

Variables	Representative Variables	Description	Source
Gross domestic product	GDP	Gross domestic product is expressed in U.S. dollars at constant prices (2015=100).	World Bank (2024) 1990-2020
Employer rate	E	Employer rate (%)	TÜİK (2024)
Unemployment	UNE	% of female labor force	World Bank (2024) 1990-2020
Labor force participation among men and women	FMP	Male and female labor force participation rate (%)	World Bank (2024) 1990-2020
Total labor force participation rate	LF	Labor force participation rate (%)	TÜİK (2024)

Based on the data obtained from the variables, the hypotheses of the study are presented below.
Direct effect hypotheses
H_1: The employer rate (E) has a significant direct effect on GDP.
H_2: The unemployment rate (UNE) has a significant direct effect on GDP.
H_3: The male and female labor force participation rate (FMP) has a significant direct effect on GDP.
H_4: The labor force participation rate (LF) has a significant direct effect on GDP.
Indirect Effect Hypotheses (LF as a Mediating Variable)

H_5: The employer rate (E) has a significant indirect effect on GDP through LF.
H_6: The unemployment rate (UNE) has a significant indirect effect on GDP through LF.
H_7: The male and female labor force participation rate (FMP) has a significant indirect effect on GDP through LF.

These hypotheses aim to test the structural relationships among the variables. During the SEM analysis, the following research questions were addressed:

- How do the employer rate (E), unemployment rate (UNE), and male and female labor force participation rate (FMP) affect the total labor force participation rate (LF)?
- How do these independent variables (E, UNE, and FMP) affect economic growth (GDP) directly or indirectly through LF?
- In addition to the positive and negative effects, what is the role of LF as a mediating variable in the model?

3.2. Findings

In this study, the Structural Equation Model (SEM), which is one of the multivariate statistical methods, was employed to reveal the relationships between observed and latent variables based on a theoretical framework through a specified model (Eygü and Eygü, 2022). The SEM results demonstrating the effects on economic growth are presented in Figure 1.

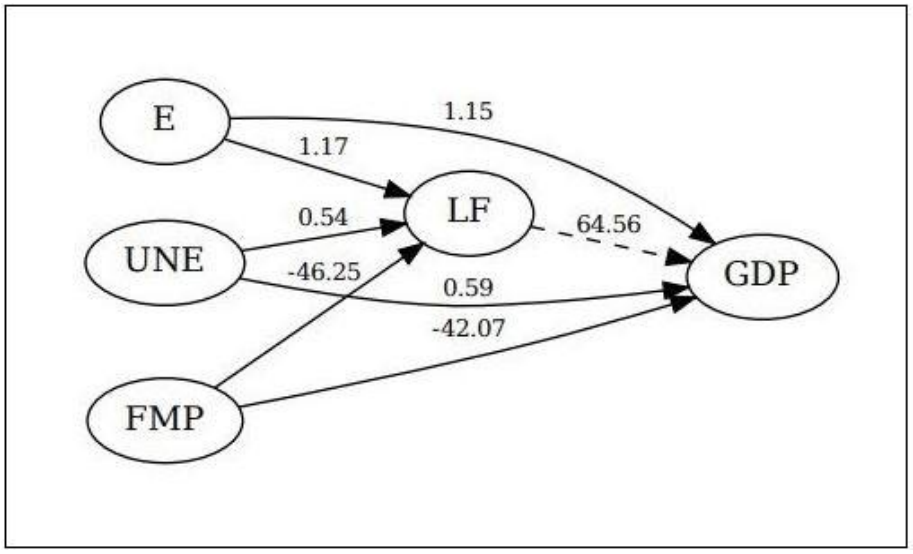


Fig. 1. Structural Equation Model with Direct and Indirect Effects

Figure 1 presents the paths and the structural model for the relationships found to be significant at the 95% confidence level ($p < 0.05$). In addition, the overall model fit indices (CFI = 0.95, NFI = 0.93, TLI = 0.93, RMSEA = 0.05, SRMR = 0.03) were found to be within the acceptable thresholds reported in the literature. Considering all fit indices together, it can be stated that the model demonstrates a very good fit to the data. The CFI and TLI values indicate a close fit to the observed data, while the RMSEA and SRMR values show that the model errors are minimal. These findings suggest that the model explains the data satisfactorily within the framework of the proposed hypotheses and that the theoretical structure is consistent. The structural equation modeling results of the study are presented in Table 2.

Table 2. Research Model SEM Results

Relationships	β	R^2	p	Hyp.	Result
E→GDP	1.15	0.89	<.001	H_1	Kabul
UNE→GDP	0.59	0.87	0.062	H_2	Red
FMP→GDP	-42.07	0.89	0.022	H_3	Kabul
LF→GDP	64.56	0.87	0.022	H_4	Kabul
E→LF	1.17	0.85	<.001	H_5	Kabul
UNE→LF	0.54	0.83	0.045	H_6	Kabul
FMP→LF	-46.25	0.85	<.001	H_7	Kabul

In the SEM diagram, the variable representing economic growth (GDP) is included in the model as the dependent variable. This variable changes under the influence of other socio-economic factors. When examined in the context of direct and indirect effects, the family employer rate (E) has a positive and direct effect on economic growth. This indicates that employers contribute directly to the economy ($\beta=1.15$, $p < 0.05$). Although the coefficient of the unemployment rate (UNE) is positive, the relationship is statistically insignificant; therefore, no strong inference can be made regarding the effect of unemployment on economic growth ($\beta=0.59$, $p > 0.05$). The male and female labor force participation rate (FMP) has a considerably high negative effect on GDP ($\beta=-42.07$, $p < 0.05$). This finding suggests that labor force participation may negatively affect economic growth beyond a certain level. On the other hand, the total labor force participation rate (LF) has a strong and positive effect on economic growth (GDP). This result demonstrates that increasing labor force participation plays an important role in contributing to economic growth ($\beta=64.56$, $p < 0.05$). In addition, the family employer rate (E) has a significant and positive effect on the total labor force participation rate (LF) ($\beta=1.17$, $p < 0.05$).

Conclusion

This study aimed to evaluate the socio-economic factors affecting economic growth in Türkiye and to analyze the direct and indirect effects of labor market dynamics on economic performance by employing a Structural Equation Model (SEM). In this context, the employer rate (E), unemployment rate (UNE), male and female labor force participation rate (FMP), and total labor force participation rate (LF) were examined as the main determinants of economic growth (GDP).

The findings of the study revealed that the employer rate and total labor force participation rate have significant and positive effects on economic growth. In particular, the positive effect of the labor force participation rate indicates that increasing participation in the labor market contributes substantially to economic expansion by improving production capacity and labor utilization. Similarly, the positive relationship between the employer rate and economic growth suggests that entrepreneurial activities and employer-based labor structures play an important role in supporting economic performance and

productive capacity.

The results also demonstrated that the employer rate positively affects the labor force participation rate, thereby indirectly contributing to economic growth. This finding highlights the importance of labor market participation as a mediating factor in the relationship between socio-economic indicators and economic growth. Therefore, policies aimed at increasing labor market participation may strengthen the overall growth performance of the economy.

On the other hand, the male and female labor force participation variable was found to have a statistically significant negative effect on economic growth. This result may indicate the existence of structural imbalances in the labor market, differences in labor productivity, or inefficiencies related to employment structures. In addition, the unemployment rate was found to have a statistically insignificant effect on economic growth, suggesting that unemployment alone may not sufficiently explain changes in economic performance within the analyzed period.

Overall, the study emphasizes that labor market dynamics are multidimensional and that economic growth is shaped not only by employment quantity but also by the structural characteristics of labor participation and employer composition. The findings provide important implications for policymakers seeking to enhance sustainable economic growth through labor market reforms and employment-oriented policies.

Despite its contributions, the study has some limitations. The analysis was conducted using annual data for the period 1991–2023 and focused only on selected socio-economic indicators in Türkiye. Future studies may benefit from incorporating additional macroeconomic variables, alternative econometric methods, and comparative analyses across different countries or regions. Furthermore, the inclusion of panel data or time-series-based structural approaches may provide deeper insights into the long-run dynamics between labor market indicators and economic growth.

REFERENCES

Chowdhury, A. H. M. Y., Hamid, M. K., & Akhi, R. A. (2019). Impact of macroeconomic variables on economic growth: Bangladesh perspective. Information Management and Computer Science, 2(2), 19-22. http://doi.org/10.26480/imcs.02.2019.19.22

Cruz, M. D. (2023). Labor productivity, real wages, and employment in OECD economies. Structural Change and Economic Dynamics, 66, 367-382. https://doi.org/10.1016/j.strueco.2023.05.007

Eygü, H. & Eygü, S. (2022). Factors affecting perceived learning satisfaction in distance education in Turkey. Cukurova University Faculty of Education Journal, 51(3), 1769-1790. https://doi.org/10.14812/cufej.1177360

Freeman, R. B. (1993). Labor markets and institutions in economic development. The American Economic Review, 83(2), 403-408. https://www.jstor.org/stable/2117698

Gunadi, I., Ratnasih, C., & Sugiyanto, S. (2025). The Interrelation of Unemployment Rate, Labor Wages, and Poverty Rate with Economic Growth: Labor Absorption as an Intervening Variable. International Journal of Social Science Humanity & Management Research. https://doi.org/10.58806/ijsshmr.2025.v4i9n08.

Haider, A., Jabeen, S., Rankaduwa, W., & Shaheen, F. (2023). The nexus between employment and economic growth: A cross-country analysis. Sustainability, 15(15), 11955. https://doi.org/10.3390/su151511955

Kreishan, F. M. (2011). Economic growth and unemployment: An empirical analysis. Journal of social sciences, 7(2), 228-231.

Nasir, M. S., Wibowo, A. R., & Yansyah, D. (2021). The determinants of economic growth: Empirical study of 10 Asia-Pacific countries. Signifikan: Jurnal Ilmu Ekonomi, 10(1), 149-160. http://doi.org/10.18752/sjie. v10i1.15310

Natsir, I., Zainuddin, Y., Sari, Y., & Zainudin, L. (2024). Ladrill Market Dynamics And Economic Growth: Evidence From Emerging Markets. Nomico. https://doi.org/10.62872/q1emv380.

Memili, E., Fang, H., Chrisman, J. J., & De Massis, A. (2015). The impact of small-and medium-sized family firms on economic growth. Small Business Economics, 45(4), 771-785. https://doi.org/10.1007/s11187-015-9670-0

Mincer, J. (1996). Economic development, growth of human capital, and the dynamics of the wage structure. Journal of Economic Growth, 1(1), 29-48. https://doi.org/10.1007/BF00163341

Mishra, N., Grima, S., & Ozen, E. (2024). Unpacking the black box: Investigating the role of social protection programmes in promoting decent work and economic growth in low-income countries. Sustainable Development, 32(5), 5825-5835. https://doi.org/10.1002/sd.3008

Soylu, Ö. B., Çakmak, İ., & Okur, F. (2018). Economic growth and unemployment issue: Panel data analysis in Eastern European Countries. Journal of International Studies, 11(1).

Quy, N. H. (2016). Relationship between economic growth, unemployment and poverty: Analysis at provincial level in Vietnam. International Journal of Economics and Finance, 8(12), 113-119. http://dx.doi.org/10.5539/ijef.v8n12p113

Tenzin, U. (2019). The nexus among economic growth, inflation and unemployment in Bhutan. South Asia Economic Journal, 20(1), 94-105. https://doi.org/10.1177/1391561418822204

Cross-Border Data Processing by Artificial Intelligence and the Efficiency of EU Legal Norms

Mihaela POP[60]

Abstract

This article analyses the effectiveness of the European Union legal framework for the cross-border processing of data used by artificial intelligence systems. Starting from the tension between the need for the free flow of data and the principles of data sovereignty, the study examines the main European legislative instruments - the GDPR, the Data Act and the AI Act - and how they influence access to data, innovation and competitiveness in the AI ecosystem. Methodologically, the paper combines legal analysis with economic assessment of compliance costs and regulatory efficiency.

The results highlight the existence of significant regulatory fragmentation and legal uncertainty, which generate high administrative costs and limit access to quality data for AI development. Despite the benefits in terms of data protection and security, the current framework may negatively affect innovation and competitiveness in the European Union. The article concludes that public policy interventions aimed at clarity, interoperability and proportionality are needed to improve regulatory efficiency and support AI development across borders.

Keywords: Cross-border data flows, Artificial intelligence governance, Data sovereignty, EU regulatory framework, Compliance costs

JEL Code: K24, L86, F15, D73

INTRODUCTION

The potential and adoption of artificial intelligence (AI) systems have rapidly increased over the last few years. AI tools, now proliferating across many sectors, derive significant functionalities from machine learning processes. Such processes generally rely on large datasets, which can be expensive, time-consuming, and legally complicated to acquire. Countless global stakeholders continue to advocate for the free, unrestricted flow of data across borders, stressing the numerous developmental advantages - economic, technical, societal, and so on - accruing from such availability (Stefan & González Fuster, 2018).

Nevertheless, in the contemporary geopolitical landscape, many governments favour data sovereignty,

[60] PhD university lecturer, "Titu Maiorescu" University, Faculty of Law and Economic Sciences - Târgu Jiu, mihaela.pop@prof.utm.ro, 0000-0002-3343-8725

seeking to preserve control over data generated by domestic entities. Data localisation mandates furthermore inhibit the establishment of competitive edge through foreign datasets and develop suboptimal, second-rate iterations of AI systems already freely accessible elsewhere. The synthetic latency model indicates that the economic value of access to data-generating activities diminishes fast after less than a month, rendering most historic datasets useless (Maria Rodrigues Araújo, 2015).

Governance arrangements can function as regulatory-economic systems that channel and structure interactions between multiple stakeholders. All data-processing frameworks, governed at the rapid rate typical of AI, thus transmogrify into significant regulatory-efficiency questions. Analysis of the relevant European Union (EU) legal instruments and institutional frameworks evidences cross-border data processing constraints that fragment EU AI governance, causing compliance burdens, legal uncertainty, and other additional costs to accumulate rapidly, diminishing overall rather than augmenting overall performance; hence, an overall regulatory-effectiveness premise appears or becomes doubtful as degree of recourse to AI widens. Data protection frameworks - Progressive and Adaptive Regulatory AI Data-Gathering Governance Model (PARADIGM) - continue granting safety-margin assurance while regulatory efficiencies turn in another direction. Dataset assembling, process tracing, and comparative studies identify mechanisms through which cross-border AI data use continues - cloud and edge processing, cooperative datasets, federated learning, and others.

THEORETICAL FRAMING: DATA SOVEREIGNTY, AI, AND GOVERNANCE

Data is the primary resource fuelling the development of artificial intelligence (AI) in the 21st century. These systems often require the processing of vast amounts of data to become effective and remain competitive. However, today a large part of personal and corporate data is governed by national legislations and often cannot cross, or be processed outside the jurisdiction where it has been collected. The notion of ‘data sovereignty’ relates to the principle according to which a government controls the data residing in its territory, further linked to public interests, security and privacy considerations. This raises questions about data mobility and consequently about the effectiveness of the AI systems trained on such data (Humerick, 2018). Therefore, greater data mobility is needed for AI to achieve its societal and economic promise while ensuring effective governance through appropriate compliance with national regulations and effective control over the use of data.

The governance of data within the European Union (EU) in a manner that facilitates societies and the economy’s digital transition while respecting data sovereignty principles and control has featured prominently in policy and regulatory discussions. The legislative proposals put forward by the European Commission in early 2022 in the area of artificial intelligence, digital services and data highlight the alliance of digitalisation and national security concerns. AI systems, however, require access to

distributed datasets to achieve the intended levels of precision. In this context, the present text takes up the undertaking of examining the efficacy of the EU regulatory framework governing the cross-border processing of data relied upon by AI systems. Attention is given to the identification of intra-EU and global datasets that remain accessible to developers and users of these systems, along with the outline of mechanisms enabling their practical use. The analysis processes the relevant provisions of the General Data Protection Regulation (GDPR) - concerning the transfer of data outside the EU - the Data Act and the proposed AI Act.

CROSS-BORDER DATA FLOWS: MECHANISMS AND CHALLENGES IN AI

Cross-border data flows underpin a wide range of artificial intelligence (AI) applications, enabling the use of data held within different jurisdictions for AI training, operation, evaluation, and maintenance. Numerous modalities support cross-border AI data use, including public and private cloud services, hybrid cloud configurations, edge computing, and federated learning. Safeguards can mitigate risks associated with cross-border AI data processing: contractual measures (e.g., standard contractual clauses), technical solutions (e.g., pseudonymization), and regulatory instruments (e.g., codes of conduct). Furthermore, two fundamental data governance principles - data minimisation (only using data that is strictly necessary) and purpose limitation (only using data for the purposes indicated at the moment of collection) - are commonly respected.

Cross-border data flows face a myriad of challenges and pressures that jeopardise AI development, deployment, and regulation. Legal uncertainty and fragmented normative landscapes threaten the coherent exercise of cross-border data processing rights. EU actors, including public authorities, face mounting compliance costs associated with determining the applicability of multiple overlapping regimes. Companies in the AI ecosystem are often unable to access sufficient quantities or quality of training data, which can undermine model performance. Data sharing across borders can also exacerbate security risks (e.g., copyright, trade secret, and malware risks) that the adoption or deployment of AI systems may introduce. AI is hindered when organisations cannot or do not share data across national jurisdictions or where the cross-border flow of data triggers stringent regulatory obligations. Secure and efficient cross-border data processing arrangements are therefore essential for maintaining the EU’s competitive AI position.

EU LEGAL NORMS GOVERNING CROSS-BORDER DATA PROCESSING

EU regulation of cross-border data processing by artificial intelligence (AI) has come under growing scrutiny as it develops in parallel with the technologies that it is intended to regulate. The European Union remains adamant in its commitment to effectively and efficiently enshrine privacy and confidentiality. While still developing, the set of European rules governing the practice comprises the General Data

Protection Regulation (GDPR), Data Act, and Artificial Intelligence Act. The cross-cutting nature of these instruments encourages an analysis that considers the extent to which they harmonize EU data-processing governance and whether they allow data-processing operations to adhere to AI-specific requirements. The individual files are thus considered together, first outlining how cross-border data processing operates under the current framework and subsequently evaluating the overall efficiency and coherence of the model.

The GDPR outlines the requirements for cross-border data transfers, specifying mechanisms such as standard contractual clauses and adequacy decisions that can facilitate movement of datasets between economic operators established in the Union and third countries. The Data Act outlines additional provisions on the sharing of data generated by connected devices, stipulating framework contracts to enable data access and semi-automated licensing to simplify negotiations. Meanwhile, the AI Act sets notification, compliance, and record-keeping obligations in response to assessed AI risk; delineates controlled datasets that must accompany applications or systems upon placing them on the market; and defines high-risk systems that, though outside the scope of cross-border movements, impose restrictions on the datasets that may be used for product-training purposes (Maria Rodrigues Araújo, 2015).

The EU's cross-border regime of data-processing rules thus comprises an intricate web of interrelated yet potentially conflicting arrangements, as different instruments either establish divergent frameworks or invoke different definitions of similar concepts. Data protection safeguards already count as a procompetitive instrument, and any further regulatory encumbrance stands to compromise transatlantic technological leadership and innovation. Conversely, the cross-border exchange of data remains indispensable to effective AI operation since, in the context of widespread data silos, leveraging the value of data increasingly hinges on transforming isolated datasets into consolidated pools. The sheer volume of datasets relevant to AI development readily exceeds the data-collective capacity of any single organisation, and the corresponding user value continues to rise exponentially (Stefan & González Fuster, 2018).

The EU regulatory framework governing cross-border data processing, underscored by the GDPR, Data Act, and AI Act, stands at the heart of the digital economy. The networked architecture of the economy qualifies data as an essential business resource. Corresponding national economic structures delineate lawful production, exchange, access, and rights to deployed data in an integrated economy, and the terminology associated with these subjects constitutes, ipso facto, a central internal. Even partial divergence from the overarching European policy network generates substantial competitive disadvantage.

General Data Protection Regulation and international transfers

The General Data Protection Regulation (GDPR) ensures adequate protection of personal data when transferred outside the European Economic Area (EEA) to third countries lacking equivalent safeguards. This legal instrument designates four pathways for legally compliant international data transfers: adequacy decisions based on an evaluation of third-country legal frameworks; standard contractual clauses (SCCs) specified by the European Commission; supplementary safeguards compatible with the aforementioned routes; and exceptions applicable under strictly defined conditions, such as explicit consent for specific cases. AI systems are frequently trained on vast data sets containing personal data and therefore generally require access to individuals' personal information, posing an insurmountable obstacle for organisations in the EU that do not have a compliant access route to such data (KATO, 2017); (Maria Rodrigues Araújo, 2015).

Data Act and data availability for AI development

Cross-border data mobility constitutes a critical precondition for the effective training, development, and deployment of a broad array of Artificial Intelligence (AI) applications and systems. This section examines the Data Act to assess whether EU norms enable AI development through increased data availability and new access regimes whilst safeguarding data control and sovereignty. The Data Act establishes a framework for making data generated by devices and through activities at the intersection of products and services more broadly accessible. Aiming to facilitate data-sharing intervention and foster a competitive environment for data exchange, it delineates four distinct access regimes: the first core regime concerns data generated from the use of products or related services - in this context, the act imposes mandatory-sharing obligations on data holders.

Mandatory-sharing obligations alone, however, do not guarantee that shared datasets are useable for training AI models. Through predefined general-purpose datasets, the Data Act incentivizes a second-access regime by providing corresponding licenses and clarifying the terms, implications, and responsibilities associated with data sharing. A corresponding regulatory sandbox further promotes the experimentation and testing of Data Act mechanisms. Additionally, the Data Act emphasizes public-sector access to data held by businesses for numerous purposes, including the advancement of AI technologies and models, further contributing to a third core-access regime for EU-based organizations. While the Data Act introduces considerable fresh possibilities for AI data access and the utilization of shared datasets, substantial obstacles persist. Uncertainty surrounding business retention rights, a lack of clarity on general-purpose datasets, and the potentially limited scope of public-sector data nonetheless impede a comprehensive assessment of the act's overall contribution. The measures envisioned may notably galvanize AI uptake, advancement, and competitiveness throughout the data-ecosystem landscape

- such gains, nevertheless, appear unlikely to match the additional burdens imposed by the Act elsewhere.

The Data Act affects the field of AI by specifying datasets that can be used, under what conditions, and for what purposes AI-development organisations can retain access to shared datasets (Veale & Zuiderveen Borgesius, 2021).

AI Act: governance of automated decision-making and data use

The AI Act governs the use and governance of automated decision-making and data use. Providers of high-risk AI systems must establish a quality management system with a documented, continuously updated risk management plan. Datasets used to train AI must meet data quality criteria including relevance, accuracy, completeness, and representativeness, with limitations on the use of sensitive data like ethnicity due to GDPR restrictions. The Act provides an exemption for high-risk systems to use sensitive data for bias detection, but only for providers of those systems, excluding data brokers. It also imposes obligations on system accuracy, robustness, cybersecurity, and discrimination, including requirements for technical documentation aligning with the Annex provisions (Veale & Zuiderveen Borgesius, 2021).

Sectoral and supervisory instruments

Cross-border data processing arrangements rarely occur in a clear and predictable sector. Originating from the original EU Data Protection Directive, the current rules on data transfers under the General Data Protection Regulation (GDPR) define personal data, the concept of data processing, and data transfers in a broad way, including all the modalities. Therefore, information can be legally gathered in one country, stored in another, accessed in a third, and further processed in many non-EU jurisdictions. In parallel, the forthcoming Data Act aims to facilitate cross-border data use at an even broader non-personal level, including machine-generated data. This Act is highly relevant for the Artificial Intelligence Act (AI Act), as it seeks the sharing of these data for compliance with the Regulation on a European Artificial Intelligence (AI) framework to which the AI After is linked directly. The Data Governance Act (DGA) also targets public sector data, but complements the legislative package with the non-personal context of machine-generated raw data. Moreover, data fed into AI systems is mostly considered non-personal because the training datasets, in general, have undergone transformations. The DGA thus intensely interrelates with the AI Act too, and beyond covering cross-border data use, it also encompasses cross-border data-seeking access. Cross-border multi-jurisdictional data transfer arrangements, albeit very complex, have thus far remained outside the GDPR and sectoral specificities have not emerged. Furthermore, short institutional and global macroeconomic factors can impinge on operating AI capabilities and significantly affect the broader and longer-term governance strategies of organizations. Hence, the focus remains on various forms of cross-border data processing both inside and outside the EU

and situated cross-border that affect regulatory and non-regulatory facility governance strategies in an ongoing local-centric drive involving very large AI data bundles.

EFFICIENCY ASSESSMENT OF EU NORMS IN THE AI ECOSYSTEM

The systematic efficiency assessment of EU norms within the AI ecosystem reveals a nuanced landscape where compliance costs, administrative burdens, and expected benefits are unevenly distributed across sectors. Organizations characterized by relatively modest data processing needs, operating environments conducive to accessible synthetic datasets, or primary engagement with low-risk AI systems find the anticipated advantages of GDPR alignment limited. Comparative evaluations underscore the safety benefits afforded by adherence to legalistic principles, yet these are frequently eclipsed by broader operational and technological preconditions that influence data access and quality.

On a broader scale, norms intended to bolster adoption, competitiveness, and robustness evidentially stimulate activity in data-rich domains, while more restrictive provisions impinge upon access within data-scarce environments. Member states pursuing comprehensive legal safeguards encounter a dual challenge: over-prescriptive regimes may stymie overall innovation, and restrictions on the AI-deployment access node hinder the scaling of systems sustained by high-quality training data. The cumulative obstacles posed by fragmented architectures diminish both legal certainty and assurance, curtailing stakeholder engagement and dissuading exploratory experimentation. Segments yet to establish broad compliance infrastructures - namely, non-life sciences or non-healthcare domains - face pronounced hesitancy attributable to these factors. Regulatory pipelines governing complex cross-border arrangements remain indeterminate, reinforcing the disincentives in these data-sparse spheres, while such arrangements in data-rich domains are surprisingly prevalent.

The complex interplay engendered by harmonisation and fragmentation invites further scrutiny. Areas where internal guidelines furnish coherent statutory matrices witness rapid regulatory spillovers, cascading through consultations and guiding agency precedents. Conversely, jurisdictions opting for broader mandates instead amplify uncertainties, necessitating demarcation not just between levels but also along substantive dimensions (Veale & Zuiderveen Borgesius, 2021).

Compliance costs and administrative burden

Compliance burdens arising from legal norms can be evaluated in terms of both monetary costs incurred while implementing processes required for compliance (compliance costs) and time-consuming procedural requirements (administrative burden) (Paliulionienė, 2009). Estimating compliance costs incurred by cross-border data processing regulations for organizations active in the AI ecosystem and assessing whether they outweigh expected marginal benefits in risk reduction can provide insights into

whether EU norms are efficient in the context of cross-border data processing for AI (Abualhaija et al., 2023). Such estimates may also reveal whether organizations face disproportionate compliance costs of other EU norms compared to expected marginal risk reduction. Efforts to estimate compliance costs are still ongoing.

Innovation, competitiveness, and data access

Accelerated digitalisation has changed the dynamics of the European market and raised new issues for the regulatory apparatus. Data portability and access to data have emerged as requirements for the development of an innovative European economy. The recent trend towards the regulation of markets where dominant firms operate, has led to specific obligations of data access for different service categories, such as messaging, or cloud back-up.

The Data Act proposal transposes these considerations, applicable to horizontal data across sectors, into the horizontal regulation of data. The EU Data Strategy considers current regulations and data access obligations to be insufficient to achieve the objectives of efficient organisation and free access to data for many economic operators; thus, the Data Act proposal aims to complement these. The impact of these regulations on artificial intelligence would consist of an extension of data access, besides an existing need for data and a growing concern about data monopolisation in the AI arena (Borghi, 2018).

Harmonization versus fragmentation across member states

Regulatory fragmentation across Member States and imperfect legal predictability impede the efficiency of EU norms pertaining to cross-border data processing by AI. While the Data Governance Act furthers EU data strategy objectives, H2 is only partially upheld. The morphological features of AI-specific legal uncertainty - ex ante indeterminacy, pervasive vagueness, and contestable meanings - devastate legal predictability and drive regulatory spillover, necessitating a clearer, more coherent approach to data governance.

Legal uncertainties accumulate proportionately to the number of legally relevant elements regarding the interpretation or application of a provision subjected to a Member State’s authorities. EU rules on regulatory sandboxes and the cross-border chain of responsibility constitute a further layer of uncertainties, whose burden multiplies when combined with diverging national legislation on, for instance, general-purpose AI, high-risk characteristics, and the environmentally sustainable use of data (Pormeister, 2018).

Regulatory fragmentation occurs when different jurisdictions establish divergent systems to regulate either the same types of activity or the same categories of risk. According to current interpretations of the GDPR by the European Data Protection Board and the European Commission, the cross-border transfer of

copyrighted datasets used for AI training does not represent a “transfer” under Art. 44, as the data remain on EU territory and a mere copy is considered for downstream deployment or commercialisation.

Judicial governance and dispute settlement

Pursuant to Article 8(1) and Recital 32 of the Regulation 2019/1150 (Platform Regulation), it is also stated that “effective content moderation and dispute handling is of paramount importance” and that “efficiency of the procedure and consistency of its outcome are two important factors that need to be carefully considered”. In that regard, the 9 July 2021 Recommendation on the ‘essential elements of a comprehensive policy against disinformation’ from the European Commission for a ‘European approach to artificial intelligence’, and the ‘Digital Services Act legislative proposal - Handbook on Artificial Intelligence’, stress that the use of Artificial Intelligence will need appropriate governance in order to avoid harmful consequences on citizens’ rights. Such a governance framework will also need to include a ‘recommendation on quality information’ in the fields of media and non-media and a ‘recommendation on the European approach to artificial intelligence’ to set direction on the use of Artificial Intelligence in the EU (Elena Alina, Ontanu & Marco, Velicogna, 2019)

COMPARATIVE ANALYSIS: EU APPROACH VERSUS GLOBAL FRAMEWORKS

Despite efforts to create global standards that govern data flows, the global landscape exhibits substantial divergence (Humerick, 2018). Within the industrialized world, the USA, EU, and China constitute three major regulatory regimes that shape cross-border data transactions. As an industrialized democratic state and founding member of the Organisation for Economic Co-operation and Development (OECD), the United States affirms a legal and regulatory framework that enables an open and free Internet for trade and economic cooperation (Maria Rodrigues Araújo, 2015).

In the American regulatory tradition, telecommunications and information networks are regulated primarily under the Communication Act of 1934 and their privacy regimes are framed in sectoral laws. The recognition of privacy as independence from domestic and foreign government surveillance is constitutionally enshrined in the American Bill of Rights. In the twenty-first century, while certain government databases constituting the domestic sphere are largely regulated through the provision of the Communications Assistance for Law Enforcement Act; for foreign data, the international network the American develops a different approach under section 702 of the Foreign Intelligent Surveillance Act that permits foreign surveillance under explicit but limited constraints.

Within such a framework, issues on data localization are currently at stake. A formal backing from the US administration on data localization bans can lead to further stimulus on digital trade. American industrial sectors have influence over global economic order and therefore support free flow of data across borders.

Such concerns suggest a deliberate balance on cross-border data flows towards aggressiveness for developing countries, and a step-wise promotional effort when faced with intensive opposition in developed countries.

The Chinese policy emphasizes the state-centric attributes. The Chinese government perceives data as a means for the sovereignty and control of population under the era of big data. Stringent Chinese data governance frameworks on public data are already at stake to govern data that respect privacy without undermining data analytic interests; on commercial purpose, parallel governance frameworks are being formulated to govern data for policing. The confidentiality service law of 2015 restrained widely values on data circulation across the territory and presently a similar approach on cross-border data still prevails. A consistent call exists on the international stage for maintenance of the jurisdictional principle on cross-border theft concerning economy security bestows substantial incentive to develop national control on cross-border data. Such control not only encompasses type of flow taking data from foreign facilities into national territory; but also, any form of foreign exchange.

United States and data localisation debates

Cross-border data processing has gained prominence in policy discussions worldwide. While the capacity to process data across borders is far from novel, the rise of Artificial Intelligence (AI) systems activated a new urgency regarding the issue. Not only do AI systems require vast amounts of high-quality data to train effectively, but certain data types and data-processing operations are also critical for inference. Despite cross-border processing being an established norm, many governments have adopted data sovereignty principles, seeking ways to localise data in line with national interests and values or restrict international data flows altogether. The United States plays a fundamental role in global economic and digital activities. Nevertheless, there has been an extensive and continuing debate there regarding data localisation. The EU–U.S. Trade and Technology Council (TTC) expressed the commitment of both parties to an open, inclusive, and global digital economy that promotes the free flow of data. The Foundational Technical Standards, International Baseline Security, and Privacy Framework documents issued by the TTC did not call for non-localisation requirements but left the door open for future queries regarding non-localisation measures to tap into TTC expertise (Stefan & González Fuster, 2018).

China and state-centric regulatory models

China’s state-centric approach to data governance revolves around a commitment to leveraging data sharing to foster an innovative economy while simultaneously safeguarding national security. Efforts in recent years have focused on establishing an overarching data governance framework at the national level and streamlining lawmaking procedures regarding cross-border data transfer. While these frameworks are not formally characterized as “data sovereignty,” many elements align with the concept - emphasizing the

importance of data as a factor of production and asserting exclusive ownership of data generated within any territory under national jurisdiction, be it cyberspace, land, or air (Li & Chen, 2023).

The Chinese Government recognises the importance of data as a new factor of production and seeks to gain technological independence and security. The Data Security Law aims to encourage secure data sharing across jurisdictions while eliminating the necessity for foreign cloud services in many circumstances and lowering the risks associated with overseas data transfer. The Personal Information Protection Law safeguards truly personal data and generally allows cross-border transfer subject to reasonable consent. A draft of the Cross-Border Data Transfer Security Assessment Measures offers detailed criteria and a risk assessment process for governing cross-border data transfer.

International instruments and mutual recognition

Various plurilateral and multilateral agreements that pursue conciliation between diverging regulatory frameworks have been developed, thus allowing cross-border data flows. Besides interoperability, such agreements promote the mutual recognition of regulations, institutions, and procedures and provide some assurance of the security of data transferred abroad (Maria Rodrigues Araújo, 2015). The prospects of compatibility and of regulatory convergence in the European Union (EU) are examined.

POLICY IMPLICATIONS AND RECOMMENDATIONS FOR IMPROVED EFFICIENCY

The data processing encouraged by AI brings unforeseeable opportunities along with potential threats to public policy, human rights protection, private risk management, and sentient welfare. Existing policy approaches tend to impede the delivery of these benefits outside the organization that developed the capability, thus curtailing data availability for cross-border AI applications, constraining development (measured by performance and functional deployment) and limiting positive outcomes . AI solutions cannot begin to rival human intelligence without multi-jurisdictional systems at the largest scale operating on diverse multi-purpose data that enable - acquisition, own capability construction, cooperation with service-offering organizations, and enhancements between organization and service-offering organization. Cross-border availability enables temporal, permissioned, and non-permissioned aspects. These activities require careful regulation in matters ranging from contract formulation to audit, retention and warranty provision, not limited to materials used for establishing possession, editing, and re-use. Low decision-speed situations create a strong need for on-going retention in cross-border scenarios and hence for in-country processing (Stefan & González Fuster, 2018).

Policy interventions facilitating broader operational freedom for AI systems and broader data acquisition for organizations at acceptable risk levels would improve normative efficiency and thus promote the use of such capabilities with greater impact. Interventions should prioritise the clarification, proportionality,

and interoperability of synchronised regulatory specifications for multi-jurisdictional enveloping systems and should open attendant governance avenues for creating norms of the common but differentiated type and for regulating mechanism exposure.

CONCLUSION

The study of cross-border data processing in the AI sector has become essential for understanding the efficiency of the European Union (EU) policy framework on data protection, privacy, governance, and sovereignty in the digital economy. Data circulation across numerous EU Member States has been made possible through new technologies. Data sovereignty has gained increasing importance due to widely acknowledged claims regarding extensive data collection by - among others - certain governments, public authorities, and private companies, alongside concerns about data control, ownership, accessibility, and use. Consequently, data sovereignty principles and initiatives have proliferated, focusing on governance measures, technologies for spatial confinement, and various definitions (not necessarily linked to the idea of a digital sovereignty doctrine). The regulatory and policy landscape around data remains characterized by fragmentation, overlaps, and a high level of uncertainty. The lack of adequate EU approaches for governing and regulating data ecosystems emerges as a critical issue. The relevant initiatives undertaken via EU legal frameworks - namely, the General Data Protection Regulation (GDPR), the Data Act, and the AI Act - seek to address the growing cross-border need for, and accessibility of, data at the crossroad between AI solutions and data infrastructures. Since the introduction of the GDPR, cross-border data flows have been impeded by legal uncertainty, excessive complexity, bureaucratic hurdles, compliance costs, and the fast-evolving AI landscape at the same time. Detailed consideration of the potential and related regulations supporting cross-border data processing conditions - from federated systems and edge-computing infrastructures - thematic networks, research infrastructures, observations institutes, and authorizations granted in the EU to third parties, chapters 3 and 3.1 of the inquiry present the situation and prospects for cementing - de/privacy compliance, local data sovereignty, data availability access measures, contractual interactions, and supported control - besides further supporting geospatial data compliance absence across numerous sectors (Maria Rodrigues Araújo, 2015). In addition to these regulations, foundational legislation governing cross-border data processing and the AI sector as a whole also fall under the scope of the analysis.

REFERENCES

Stefan, M. & González Fuster, G. (2018). Cross-border Access to Electronic Data through Judicial Cooperation in Criminal Matters. State of the art and latest developments in the EU and the US. CEPS Liberty and Security in Europe Papers No. 2018-07, November 2018. Available at: https://cdn.ceps.eu/wp-content/uploads/2018/12/MSGGF_JudicialCooperationInCriminalMatters-2.pdf

Maria Rodrigues Araújo, A. (2015). The Right to Data Protection and the Commission's Adequacy

Decision. Available at: https://hdl.handle.net/1822/46778

Humerick, M. (2018). Taking AI Personally: How the E.U. Must Learn to Balance the Interests of Personal Data Privacy & Artificial Intelligence. Available at: https://digitalcommons.law.scu.edu/chtlj/vol34/iss4/3

Kato, T. (2017). Implications of the CJEU Judgement on the US Safe Harbour Agreement. Available at: https://chuo-u.repo.nii.ac.jp/record/8858/files/0010-4116_50_4_69~102.pdf

Veale, M. & Zuiderveen Borgesius, F. (2021). Demystifying the Draft EU Artificial Intelligence Act. https://doi.org/10.31235/osf.io/38p5f

Paliulionienė, L. (2009). Administracinės naštos analizė teisės aktų rengimo sistemoje. Analysis of administrative burden in the legislative drafting system. https://doi.org/10.15388/Im.2009.0.3233

Abualhaija, S., Ceci, M., & Briand, L. (2023). Legal Requirements Analysis. Available at: https://arxiv.org/pdf/2311.13871

Borghi, M. (2018). Portabilità dei dati e regolazione dei mercati digitali / Data portability and regulation of digital markets. http://dx.doi.org/10.2139/ssrn.3617792

Pormeister, K. (2018). Genetic research and applicable law: the intra-EU conflict of laws as a regulatory challenge to cross-border genetic research. Journal of law and the biosciences, 5(3), 706–723. https://doi.org/10.1093/jlb/lsy023

Elena Alina, Ontanu, E. A. & Marco, Velicogna, M. (2019). EU judicial procedures and case law databases: What's going on and what may lay ahead? In G. Peruginelli, & S. Faro (Eds.), Knowledge of the law in the big data age (2019 ed., Vol. 317, pp. 250-261). IOS Press. https://doi.org/10.3233/FAIA190026

Li, W. & Chen, J. (2023). From Brussels Effect to Gravity Assists: Understanding the Evolution of the GDPR-Inspired Personal Information Protection Law in China. https://doi.org/10.1016/j.clsr.2024.105994

A Comparative Study on the Structural Performance of Bus Handrails with Different Wall Thicknesses via Finite Element Method

Ali Osman Güney[61] Orhan Dedeoğlu[62] Şenol Çalışkan[63]

Abstract

This research is part of weight reduction studies carried out in buses and deals with investigating the structural behaviour of handrail bars. In this direction, the mechanical behaviour of grabbing bars with different thicknesses was evaluated by the finite element method (FEM); the effects of changes in thickness on stress, total deformation and weight were analysed comparatively.

The grab bar model was defined to have fixed supports at both ends, and numerical analyses were carried out under 30 different loading scenarios representing real usage conditions. In the analyses, sturdiness steel St37 was taken as the material of the grabbing bar, and the obtained stress and deformation values were evaluated within the elastic behaviour limits of this material.

According to the analysis results, reducing the thickness resulted in a 23.7% decrease in the system weight, but on the other hand, stress and deformation levels increased. However, stress values obtained under all loading conditions were found to be below the elastic limit of the St37 material. This indicates that reducing the weight by finding the proper thickness is possible without sacrificing the structural safety. Testing in other load conditions revealed that stress concentration areas usually occur near tube fixing points and load application points. In addition, it was seen that deformation values remained within acceptable limits from the service conditions point of view and that the design met the functional requirements.

Keywords: Handrail, Finite Element Method, Weight Optimisation, Structural Analysis.

1. Introduction

Public transport instruments are a cornerstone in making urban transport accessible, sustainable and with high capacity. Especially urban buses are subjected to changing passenger load in the course of the day,

[61] Dr.,Research Assistant, Bursa Technical University, Mechanical Engineering, ali.guney@btu.edu.tr, 0000-0001-5167-3967

[62] Concept Design Engineer, Karsan Inc, orhandedeoglu16@gmail.com, 0000-0001-7791-6509

[63] R&D Passenger Compartment Interior Trim Design Engineer, Karsan Inc, senolcal19896@gmail.com, 0009-0006-5433-2002

stop-go cycles, spontaneous braking and acceleration conditions, which not only make the buses a subject of vehicle dynamic considerations but also pose multiple engineering requirements from the perspective of passenger safety and interior layout design. At this point, holding poles in the bus interiors is considered one of the important components in a structural way because the passenger carrying them physically is the one standing, and it is these poles that enable the passenger to maintain the balance, limit the movement of the passengers during serendipitous motions of the vehicle and consequently, directly enhance the safety of the passenger (Edwards et al., 2012; UNECE R107).

Bus passenger safety is mostly handled through aspects such as crash safety, body strength, door systems, seat structure and emergency exit arrangements. However, at the same time, a significant portion of injuries in city buses are not only due to crash source incidents but also non-crash source events such as sudden braking, acceleration, cornering and the loss of balance of the passenger inside the vehicle (Edwards et al., 2012; Palacio et al., 2009). Standing passengers are more affected by vehicle movements compared to sitting passengers and therefore the location, accessibility, stiffness and structural reliability of the holding elements become very critical for passenger safety. In this respect, holding poles and handrails have to be seen not only as ergonomic interior furnishings but also as safety aides that limit the movement of the passenger and contribute to the reduction of injury risk (Edwards et al., 2012; Palacio et al., 2009).

Designing the handrails used in buses should simultaneously address accessibility, ergonomic gripping diameter, surface characteristics, ease of installation, manufacturability, strength, stiffness, weight, and cost parameters. Regulations such as UNECE R107 specify that a sufficient number of handrails must be available in the sections where standing passengers are transported; the handrails must be easy and safe for passengers to grasp, and they must be designed in a way that a passenger will not get injured from them (UNECE R107). However, these regulations primarily focus on the layout, accessibility, and general geometrical suitability of the handrails, they do not directly reveal the comparative structural performance of handrail sections of different wall thicknesses in terms of stress, deformation, and weight. This fact leads to the necessity of separately evaluating the structural behaviour of the handrails used in actual vehicle applications by numerical analysis methods.

Tube section members are widely preferred in vehicle body structures, internal equipment elements and various engineering applications due to their high specific stiffness, low weight benefits, producibility and load-carrying features (Lan et al., 2004; Gauchia et al., 2010; Khalaf et al., 2022). Especially in steel sections with circular hollow, thickness, since it directly affects section area, section moment of inertia and bending stiffness, it is a determinant design parameter on stress distribution and total deformation behaviour (Khalaf et al., 2022). Increasing thickness usually improves structural stiffness and strength,

but it also increases the weight of the part and the consumption of the material. On the other hand, decreasing thickness may provide the advantage of weight and material usage; however, it can negatively affect stress and deformation behaviour due to the reduction of the section area and moment of inertia of the section. Therefore, thickness reduction in tube section holding elements should be considered as a design variable that needs to be carefully verified by finite element analyses in terms of structural safety and stiffness criteria (Lan et al., 2004; Gauchia et al., 2010; Khalaf et al., 2022).

In vehicle design, weight reduction through material usage and bringing down the total vehicle mass while maintaining structural performance are major engineering approaches (Lan et al., 2004; Gauchia et al., 2010). Limited weight improvements achieved in structural components largely contribute to vehicle weight reduction and more efficient material use. However, geometrical changes for the purpose of weight reduction in interior components, which are directly related to passenger safety, cannot be evaluated solely on the basis of weight gain. Therefore, the applicability of the thickness reduction in grip tubes should be decided by considering the maximum stress level, whether the material stayed within the elastic limit, total deformation behaviour, and weight change together (Khalaf et al., 2022; Li et al. 2019).

The finite element method is a very powerful engineering tool which is widely used for the numerical study of complex geometries, different boundary conditions and variable loading conditions. Especially in the vehicle structures, the finite element method is used for light-weighting and optimising the works and in addition to that, it provides the opportunity for joint consideration of stress, deformation, stiffness and weight criteria. Lan et al. (2004), by using the finite elements method, bus side body structures have been examined for structural strength, rigidity and weight optimisations, and have shown that design variables such as cross-section geometry and wall thickness are essentially determining factors in the light-weighting operations. Similarly, Gauchia et al. (2010), considering real bus structures, have evaluated the torsional stiffness and weight optimisation through the finite element method and have also revealed the need for a balanced design approach between structural performance and weight. Khalaf et al. (2022) have studied the bending behaviour of steel circular hollow sections experimentally and theoretically by the finite element method and have proved that the bending behaviour of tubular section structures can be numerically confidently evaluated.

In literature, there are various studies on bus passenger safety, non-collision injury mechanisms, standing passenger safety and vehicle interior layout (Edwards et al., 2022; Palacio et al., 2009; Uetake and Shimoda, 2006; Peng et al., 2018; Seriani et al., 2022]. Uetake and Shimoda (2006) conducted experimental studies to determine passengers' gripping and holding forces on the stanchion and handrail elements used in buses and showed that the holding force that can be applied by a passenger depends on the dimension of the tube-type gripping element. Peng et al. (2018) by exploring the dynamic responses

of standing passengers and head injury risks during a crash, have indicated that the height of a holding element should be considered as an interior design parameter from the viewpoint of passenger safety. Seriani et al. (2022) conducted an experimental study into how the location of a vertical holding element in metro vehicles affects the accessibility of the wheelchair passengers for alighting and boarding and have demonstrated that the arrangement of holding elements is very important for passenger mobility. Regarding structural analysis and optimisation, there are research works on bus body structures, tubular section members and holding systems evaluated by the finite elements method (Lan et al., 2004; Gauchia et al., 2010; Khalaf et al., 2022; Li et al. 2019; Holenko et al., 2026). Li et al. (2019) have demonstrated that the metro holding elements can be analysed by finite elements, for the response surface method and Taguchi design and can be optimised from the point of view of both strength and mass. Holenko et al. (2026) have studied the effects on body stiffness, stress-strain behaviour, and passive safety of the bus body skeleton when a welded holding system network is integrated into it through dynamic modelling and finite element analysis.

However, it appears that a major portion of the current studies focus on the bus body structure, side structure, chassis, crash safety, passenger injury mechanisms, ergonomic grasp behaviour, spatial layout of grasp elements or integrated body grasp systems (Palacio et al., 2008; Lan et al., 2004; Gauchia et al., 2010; Li et al., 2019; Uetake and Shimoda 2006; Peng et al., 2018; Seriani et al.,2022; Holenko et al.,2026). In contrast, it is considered that there are only limited studies that have investigated the stress, deformation and weight performance characteristics of individual bus grab bars, which are the direct touch points of passengers, under different wall thicknesses in a comparative manner. Therefore, the conduction of wall thickness analysis on a grab bar geometry taken from a real vehicle application will be capable of closing this literature gap and, at the same time, support industrial design decisions by numerical data.

In this research, using the geometry of a one-piece grab rail tube used in city buses as a reference, the structural behaviour of St37 structural steel tubes with the same outer diameter but different wall thicknesses under static loads have been comparatively studied by the finite element method. To this end, six different thickness scenarios of 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 mm have been created, and each scenario has been analysed under five different force application scenarios representing passenger holding behaviour. The criteria for evaluation of the model have been maximum von Mises stress, total deformation and weight change and the material being within the elastic limit was defined as the fundamental structural safety criterion. This work provides a novel contribution in that it systematically reveals the effects of wall thickness changes in bus handrail bar on structural safety, stiffness behaviour and weight, it aims at the identification of a wall thickness lighter and working within the elastic limits as

an alternative to the present design thickness and it evaluates passenger safety and the need for mitigation in the same engineering frame.

2. Material Metod

This section describes the finite element analysis model that has been created to investigate the structural behaviour of bus grab rail tubes with different wall thicknesses. The analyses were carried out in the ANSYS Static Structural environment, and St37 structural steel was chosen as the material. For the same outer geometry of a handrail tube, wall thickness scenarios changing in the range of 1.0–5.0 mm were created; each scenario was compared in terms of maximum von Mises stress, total deformation and weight change under given loading conditions. This approach aimed at the systematic evaluation of the impacts of tube thickness on structural safety, stiffness behaviour and weight reduction potential.

The primary structural safety criterion in the study is that the maximum von Mises stress obtained from the analyses remains below the yield strength of St37 steel. As for total deformation, no numerical upper limit based on standard, regulation or company specification was defined. Therefore, deformation results have not been considered as an independent acceptance-rejection criterion; instead, they were used for evaluating the stiffness behaviour of different wall thickness scenarios. The final design interpretation was made by considering stress state, deformation trend and weight change together.

2.1. Geometric Model and Design Variables

The geometric model examined in the study is based on the geometry of a one-piece horizontal handrail tube, which is used on city buses to meet the passengers' need of holding. The model, the main horizontal tube where the passenger contact is made and the vertical holding members connected to this tube. The geometry selected for the analysis is presented in Figure 1. This geometry was selected because it represents one of the critical components among the one-piece horizontal grab rail tubes used in the current bus applications of Karsan Automotive Industry and Trade Inc., having the longest distance between support points. From a structural mechanical point of view, increasing the distance between the supports can lead to an increase in the bending moments of the element and in the total deformations under the same loading conditions. Therefore, the mentioned grab bar was treated as a critical part for evaluating its stress and deformation behaviour under passenger-induced loading scenarios.

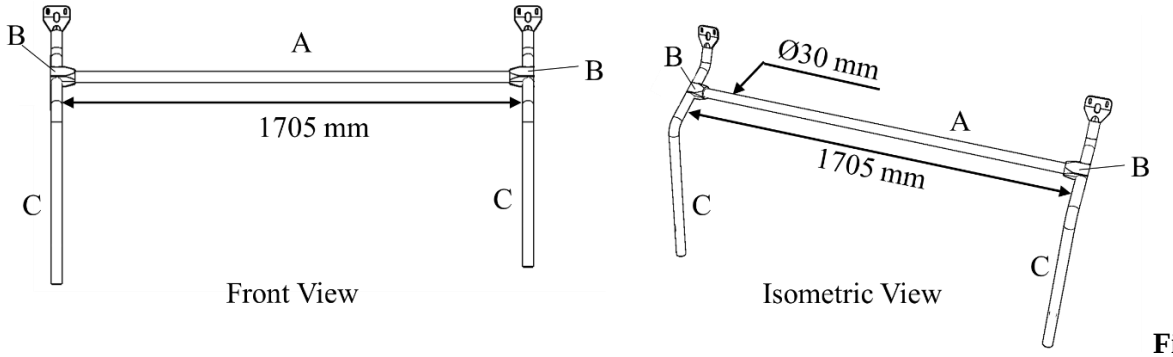


Figure 1.
Geometry and main components of the selected horizontal grab rail tube: (A) horizontal grab rail tube, (B) fixing point and (C) vertical grab rail tube.

The outside diameter of the horizontal handrail bar used in the analyses has been kept constant and the basic design variable has been only the thickness of the grab rail tube. Thanks to this approach, the external geometry, the connection arrangement, and the loading positions remained constant, whereas the change of thickness could be directly compared for the structural behaviour. Thus, the effects of different thicknesses on the maximum stress, total deformation, and weight could be systematically evaluated from the same geometric reference.

In the numerical analysis, six different thickness scenarios (Table 1) were created as 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 mm. These scenarios were respectively named T1, T2, T3, T4, T5, and T6. 2.0 mm thickness used in the current vehicle application of Karsan Automotive Industry and Trade Inc. was taken as the reference design and the lower and higher thickness values have been compared to this design. In this context, 1.0 and 1.5 mm thicknesses were evaluated for their potential in weight reduction, and 3.0, 4.0 and 5.0 mm thicknesses, on the other hand, were considered as the ones revealing the effect of stiffness and strength increase on the weight.

Table 1. Wall thickness scenarios

Scenario	Wall thickness (mm)	Description
T1	1.0	Lowest wall thickness in terms of weight reduction
T2	1.5	Prominent alternative design with weight reduction potential
T3	2.0	Reference design used in the current vehicle application
T4	3.0	Increased wall thickness scenario
T5	4.0	High-stiffness scenario
T6	5.0	Highest wall thickness scenario

During the geometric modelling process, for all the thickness scenarios, the outer diameter of the tube, the overall spatial geometry, and the points of connection were kept the same. Hence, the differences observed in the analysis results were related directly to the effect of the thickness change on the cross-sectional area, the moment of inertia of the section and consequently on the structural stiffness. This parametric approach enables the design of the holding tube to evaluate the trade-offs between weight reduction and structural safety.

2.2. Material Properties

In the finite element analyses, St37 structural steel was used as the material for the handrail tube. St37 material was chosen since this is the tube material of the handrail bar in the existing vehicle applications of Karsan Automotive Industry and Trade Inc. Thus, various wall thickness scenarios were compared under the same material properties; and the differences observed in the analysis results were ensured to be caused directly by the geometric changes, especially the section properties dependent on the tube wall thickness.

The material behaviour in the finite element model was defined as linear elastic and isotropic (EN 1993-1-1:2005). In this approach, the elasticity modulus and Poisson's ratio were used for the definition of the elastic stress-strain behaviour; the density value, on the other hand, was taken as the basis for the computation of the weight values belonging to different wall thickness scenarios. Table 2 presents the mechanical properties of the St37 structural steel used in the analyses (EN 10025-2:2019).

Table 2. Mechanical properties of St37 structural steel (EN 10025-2:2019)

Property	Value

Young's modulus, E	200 GPa
Yield Strength, σ_y	235 MPa
Ultimate Tensile Strength, σ_u	460 MPa
Density, ρ	7850 kg/m³
Poisson's ratio, v	0.30

The material model was defined as linear elastic, and the mechanical properties given in Table 2 were employed in the analyses. The purpose of the study was to compare the effects of different wall thickness scenarios on stress, deformation, and weight; therefore, the plastic deformation behaviour was not modelled separately.

2.3. Boundary Conditions and Loading Scenarios

Boundary conditions in finite element analysis typically represent support conditions of the horizontal grab rail, and load effects from passengers. Connection areas between horizontal and vertical grab rails are fixed supports in the model; and all degrees of freedom in these areas are constrained. Also, it is assumed that vertical grab rails do not deform. Boundary conditions and force application areas are shown schematically in Figure 2.

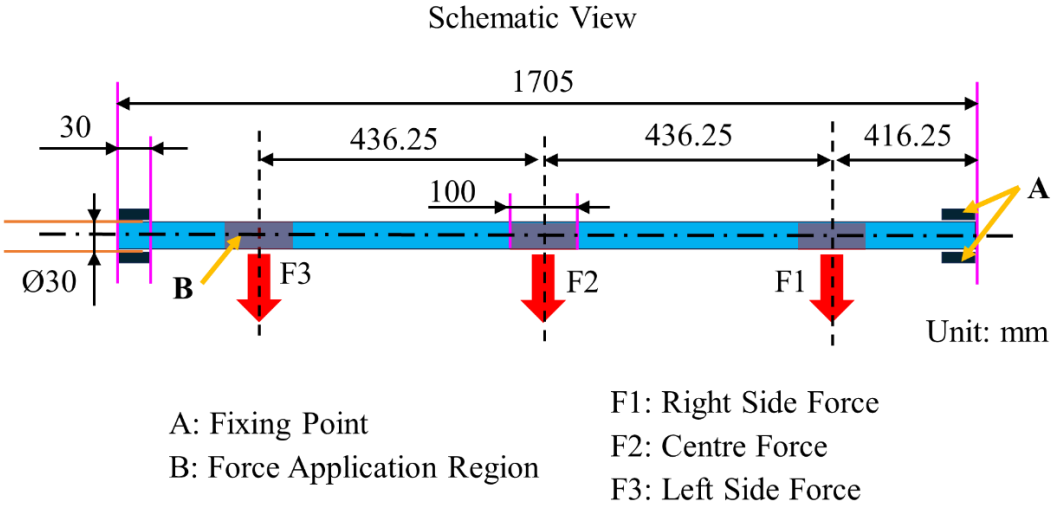


Figure 2. Boundary conditions of the horizontal grab rail tube

To model the passenger grip loads, three different force application areas are defined on the grab rail: the right-hand, middle, and left-hand grip areas, which are respectively named F1, F2 and F3. F1 represents vertical loads applied from the right side, F2 is for the centre side, and F3 is for the left side vertical loads. Realistically, to reflect passenger hand contact not as a point load but as a distributed load, forces have been applied to the contact areas defined on the model. UNECE R107 specifies that each grab bar shall accommodate a hand-holding area of at least 100 mm in length. Based on this requirement, the force application area has been approximately defined as 100 mm long contact surfaces in the present study, and this mentioned contact length is used with all loading scenarios.

The loads from passengers that are transmitted to the grab elements have been defined considering the human body's static load transfer behaviour. In human biomechanics analyses, the human body or body segments are evaluated through free-body diagrams; when establishing force equilibrium, mass, gravity and contact/reaction forces are considered together (Thomas et al., 2023). In line with this approach, the design load transferred to the grab rail is deliberately conservatively defined through a single weight force of a passenger. Accordingly, passenger downward load has been defined as a static equivalent force resulting from the multiplication of passenger mass by gravity and applied to the model.

Regarding the determination of the load magnitude, regulation-based passenger and crew masses conforming to European legislation have been taken into account; within this framework, references UNECE R107 and Regulation (EU) No 1230/2012 have been used. UNECE R107 Annex 11 defines passenger mass according to vehicle classes, 68 kg for both Class I and Class A vehicles, and 71 kg for Class II, Class III and Class B vehicles. The same regulations indicate driver and crew member masses as 75 kg. However, since structural strength assessment of grab rails in relevant regulations does not directly define a passenger holding load, a mass of 75 kg to represent each passenger was considered for the purpose of this study. The acceptance is in line with the mass assumptions of human beings for conservative structural design approaches in the regulations. Thus, the selected design mass of 75 kg is about 10.3% more conservative than the 68 kg value given for Class I vehicles in UNECE

R107 Annex 11 and about 5.6% more conservative than the 71 kg value given for Class II vehicles, providing loading scenarios on the safe side. Definition of the applied forces are given in Table 3.

Table 3. Definition of the applied forces

Symbol	Description	Force (N)
F1	Right Side Force	
F2	Centre Force	735.75
F3	Left Side Force	

In order to study the behaviour of the grab rail under different usage conditions, five different force application scenarios have been created. Those loading situations represent the cases of passengers using the grab rail from different locations and in different combinations of loading. Force application scenarios are given in Table 4.

Table 4. Force application scenarios

Case Number	Applied Forces	Represented Condition
Case-1	F1 + F3	Simultaneous gripping from the right and left regions
Case-2	F1 + F2 + F3	Simultaneous gripping from the right, central and left regions
Case-3	F2	Single gripping from the central region
Case-4	F1 + F2	Simultaneous gripping from the right and central regions
Case-5	F1	Single gripping from the right-hand side

The five defined force application scenarios were applied separately to each of the six different tube wall thicknesses evaluated in the study. Hence, in total, 30 different loading scenarios (Table 5) were generated. In all analyses, boundary conditions, load application areas and force magnitudes were kept constant while only the grab bar thickness parameter was changed. Through this approach, the effect of change in thickness on maximum von-Mises stress, total deformation and weight reduction under different loading scenarios was comparatively evaluated.

Table 5. Loading scenarios

		Wall Thicknesses					
		T1	**T2**	**T3**	**T4**	**T5**	**T6**
Force Application Scenarios	**Case-1**	F1 + F3	F1 + F3	F1 + F3	F1 + F3	F1 + F3	F1 + F3
	Case-2	F1 + F2 + F3	F1 + F2 + F3	F1 + F2 + F3	F1 + F2 + F3	F1 + F2 + F3	F1 + F2 + F3
	Case-3	F2	F2	F2	F2	F2	F2

	Case-4	F1 + F2	F1 + F2	F1 + F2	F1 + F2	F1 + F2	F1 + F2
	Case-5	F1	F1	F1	F1	F1	F1

2.4. Finite Element Model and Meshing

To evaluate the structural behaviour of the grab bar under different wall thicknesses, finite element analyses were performed in the ANSYS Static Structural environment. The studied component is a thin-walled tube element, which is very long relative to its cross-sectional dimensions and its load-carrying behaviour is mainly subjected to bending. It is widely recognised in the literature (Timoshenko and Gere, 1961; Malkus et al., 2002) that for such members structural behaviour may be described with high accuracy by beam theories based on the assumption of plane sections remaining plane. For this reason, a one-dimensional linear beam element approach was preferred in the analyses, and the handrail bar was modelled in such a way as to represent its bending stiffness and displacement behaviour. The beam element approach, especially in the geometries of tube and profile, drastically reduces the solution time, while allowing the stress and deformation behaviour to be obtained reliably (Malkus et al., 2002). It has also been shown that, in the finite element analyses of vehicle structures, tube and profile-shaped elements could be modelled by beam elements and such elements were used to represent axial load, bending, and torsion effects (Gauchia et al., 2010).

For each wall thickness scenario, the same geometric layout, the same boundary conditions, and the same loading regions were used. The outer diameter of the tube was fixed, whereas changes in wall thicknesses were defined in the model through cross-sectional properties. Thus, only the cross-sectional area, cross-sectional moment of inertia, and the resulting structural stiffness were different between the models with different thicknesses; potential differences coming from boundary conditions and loading arrangements have been eliminated. The literature (Khalaf et al., 2022) shows that the bending behaviour of circular hollow steel tubes could be evaluated by the finite element method and verified by comparison with experimental results. The beam element approach used in this study was selected to assess the comparative stress and strain behaviour of the retention grab rail tube under different wall thicknesses.

Before running the parametric analyses, a mesh independence study was conducted to verify that the numerical results are independent of the mesh density. The mesh independence assessment was carried out on the model with 1 mm wall thickness (T1), which is one of the structurally most critical conditions, and under the loading scenario where the forces F1, F2, and F3 were simultaneously applied. The main reason for choosing the model with the lowest wall thickness is that the model exhibits a more sensitive behaviour to stress and deformation changes due to the lower section stiffness of the cross-section. Within the scope of mesh independence, six different mesh structures were created in total, from Type-1 to Type-6, and the element size was gradually reduced so that maximum von Mises stress values obtained for each mesh density were compared. Mesh convergence studies are given in Table 6.

Table 6. Mesh convergence studies

Mesh type	Number of elements	Maximum stress (MPa)	Mesh size (mm)	Variation (%)
Type-1	36	164.54	50	–
Type-2	72	178.50	25	7.72
Type-3	149	185.69	12	3.87
Type-4	289	188.98	6	1.74
Type-5	574	190.67	3	0.89
Type-6	856	191.23	2	0.29

Significant differences in stress values were observed between coarse mesh structures with a low number of elements and fine mesh structures with a higher number of elements. As the mesh density is increased, the change in the stress results is decreased, and it can be concluded that the solution is converging. Especially, for the Type-6 mesh structure in which the element size was reduced to 2 mm, the change in maximum von-Mises stress values obtained in comparison to the previous mesh density was found to be very low, and the results were converging.

Therefore, considering the balance between solution accuracy and computational cost, the Type-6 mesh with 2 mm element size was used for all analyses. In the final finite element model, one-dimensional beam elements with a linear formulation were used; the model consisted of 856 elements and 1713 nodes. The mesh characteristics and meshing of the finite element model are given in Table 7 and Figure 3, respectively.

Table 7. Mesh characteristics

Parameter	Value
Element type	Linear Beam (1D)
Number of elements	856
Number of nodes	1713
Element size	2 mm

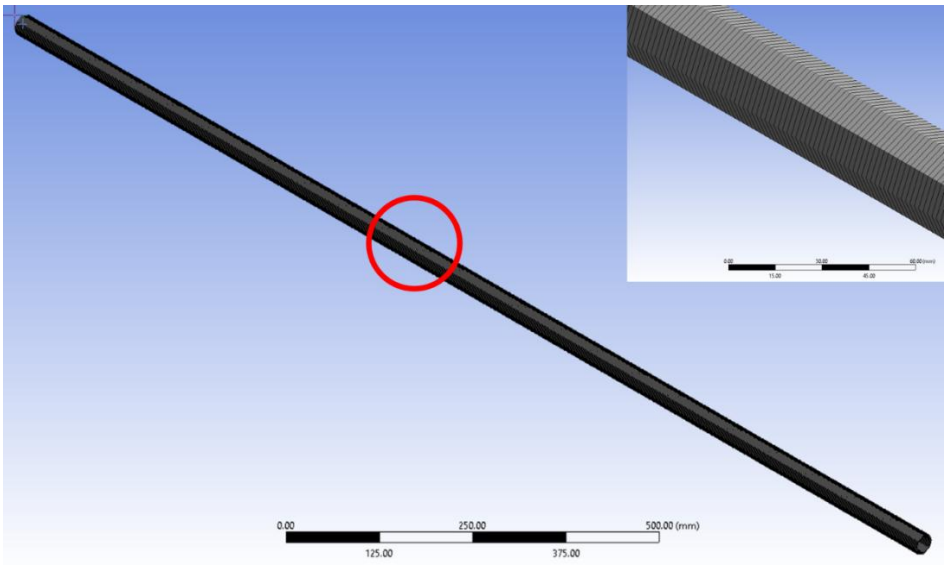


Figure 3. Meshing

3. Results and Discussions

In this section, the structural behaviour of handrail tubes with different thicknesses has been compared under five force application scenarios. The results of the analysis have been examined in terms of maximum von-Mises stress, total deformation, and weight criteria.

Within the scope of the study, six different models with wall thicknesses of 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 mm were analysed under five different force application scenarios. Thus, a total of 30 loading scenarios were generated, and the effects of wall thickness and loading position on structural behaviour were comprehensively evaluated. The boundary conditions were kept constant in all analyses, and each loading scenario was applied to the corresponding wall thickness models under identical conditions.

Firstly, maximum von Mises stresses are considered in the assessment of the results. Then, deformation values are used to evaluate the stiffness behaviour. Besides, weight changes are analysed with reference to 2.0 mm thickness, which is the thickness used in the current application. The findings obtained have been discussed by considering the structural safety and weight reduction together.

3.1. Stress Analyses

Initially, the maximum von Mises stress values were examined in order to evaluate the structural safety of the grab rail tubes with different wall thicknesses. The model of each wall thickness was subjected to analysis under the five different force application scenarios defined and the maximum stress values obtained were compared to the 235 MPa yield strength of St37 steel. Since the von Mises equivalent stress approach is a commonly used evaluation criterion that allows the comparison of the multi-axial stress state in ductile metal materials with the uniaxial yield strength, it was used in this study as the main criterion for elastic limit control (Ansys, 2023). With this evaluation approach, the effect of the change in the tube wall thickness on the stress was directly compared under the same boundary conditions and the same loading magnitudes.

Maximum von Mises stress results for all loading scenarios are given in Figure 4. When results are evaluated together, it was found that the highest maximum von Mises stress occurred in the Case-5 scenario with a single force application from the right. This situation indicates that the retention tube exhibits a stress behaviour sensitive to the loading position. Especially in the cases of single and asymmetric loading, the bending effect of the force applied to the tube becomes more prominent and the stresses are concentrated in the areas close to the support. Loading position, cross-section properties and bending effect in tube cross-section members are considered as fundamental parameters that directly affect stress distribution (Khalaf et al. 2022). In contrast, in loading scenarios with force application from multiple points, the distribution of the force effect to different regions caused the stress levels to be lower compared to the single-loading scenario (Case-3). Therefore, Case-5 was identified as the most critical loading scenario in terms of stress behaviour.

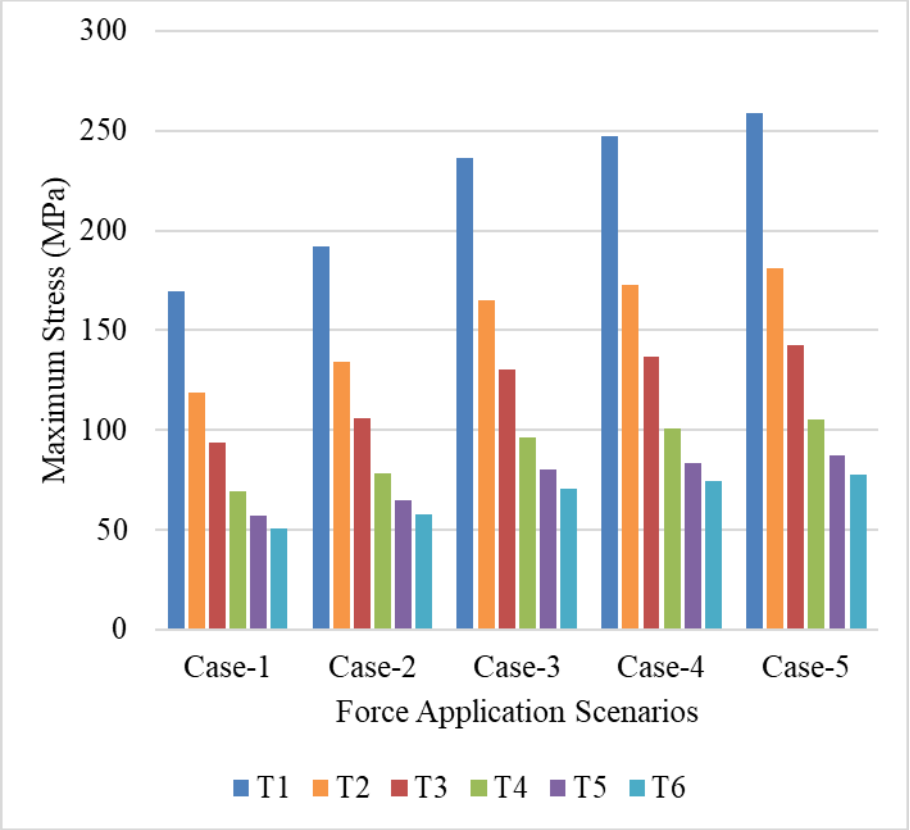


Figure 4. Maximum von Mises stress values obtained for all force application scenarios (Cases 1–5) and wall thickness (T1-T6). (Cases 1–5 and T1–T6 are defined in Tables 4 and 1, respectively.)

For the most critical loading scenario in terms of stress, i.e. Case-5, the maximum von Mises stress values for different wall thicknesses are compared in Figure 5. When the change with respect to the wall thickness is investigated, the bowing section becomes thinner, and the maximum von Mises stress increases substantially. The maximum stress value obtained in the scenario with the lowest wall thickness, 1.0 mm, has exceeded the 235 MPa yield strength defined for St37 steel. Therefore, 1.0 mm wall thickness was not found to be suitable from the perspective of the elastic limit criterion. On the contrary, the model with 1.5 mm wall thickness reported that the maximum von Mises stress was below the yield strength. This outcome indicates that 1.5 mm wall thickness remains within the elastic limit in terms of the stress criterion and is the first alternative scenario that has the potential for weight reduction compared to the existing 2.0 mm reference design.

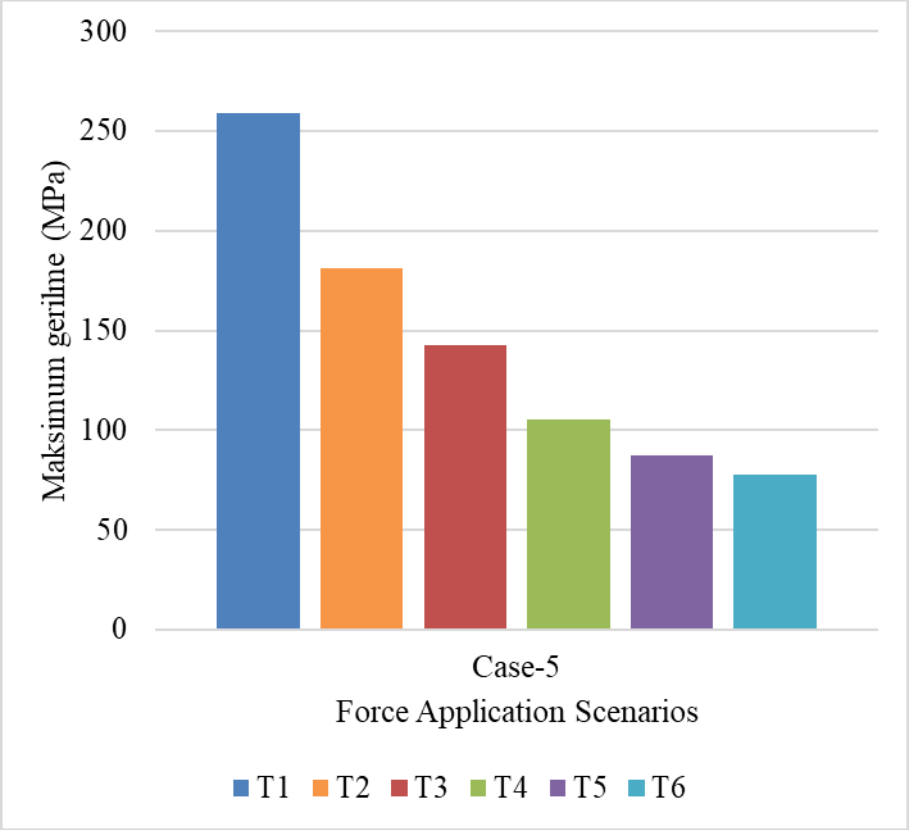


Figure 5. Maximum von Mises stress values for the Case 5 loading scenario and different wall-thickness (T1-T6). (Cases 1–5 and T1–T6 are defined in Tables 4 and 1, respectively.)

The scenarios of 3.0, 4.0, and 5.0 mm in which the wall thickness is increased showed a gradual decrease in the maximum von Mises stress values. This trend can be explained by the increase in the bending stiffness of the grab rail tube due to the increase in the cross-sectional area and the moment of inertia with the increase in wall thickness. Experimental and numerical investigations on circular hollow steel sections have shown that section parameters such as the thickness and diameter-to-thickness ratio govern the bending behaviour (Khalaf et al. 2022). However, the stress reduction at higher thicknesses is accompanied by a significant increase in the weight of the part. Therefore, simply selecting the highest wall thickness that provides the minimum stress value is not a sufficient design approach for vehicle components where lightweight design is a key objective.

When the stress analyses were generally evaluated, it was found that the model with 1.0 mm wall thickness failed the yield strength criterion, whereas the thickness scenarios of 1.5 mm and above remained within the elastic limit in terms of the maximum von Mises stress. This result reveals that 1.5 mm wall thickness is one of the critical threshold thicknesses from the viewpoint of stress safety. However, it is not sufficient to base the final design decision only on the stress results. It is also emphasised that strength and mass criteria need to be simultaneously considered in the structural optimisation studies of retention elements (Li et al., 2019). Therefore, the 1.5 mm wall thickness scenario, which is acceptable from the view of the stress criterion, should also be evaluated in terms of deformation behaviour and weight reduction.

3.2. Deformation Analyses

The total deformation results have been analysed to assess the stiffness behaviour of the handrail tube with different wall thicknesses under the load. Stress analyses reveal whether the material stays within the elastic limit; on the other hand, deformation analyses indicate to what extent the handrail tube displaces under the load of passengers and how the change in wall thickness affects the structural stiffness. In tubular elements, changes in wall thickness directly influence the second moment of area and, consequently, the bending stiffness. Therefore, deformation behaviour is considered an important performance indicator in the assessment of wall thickness (Khalaf et al. 2022).

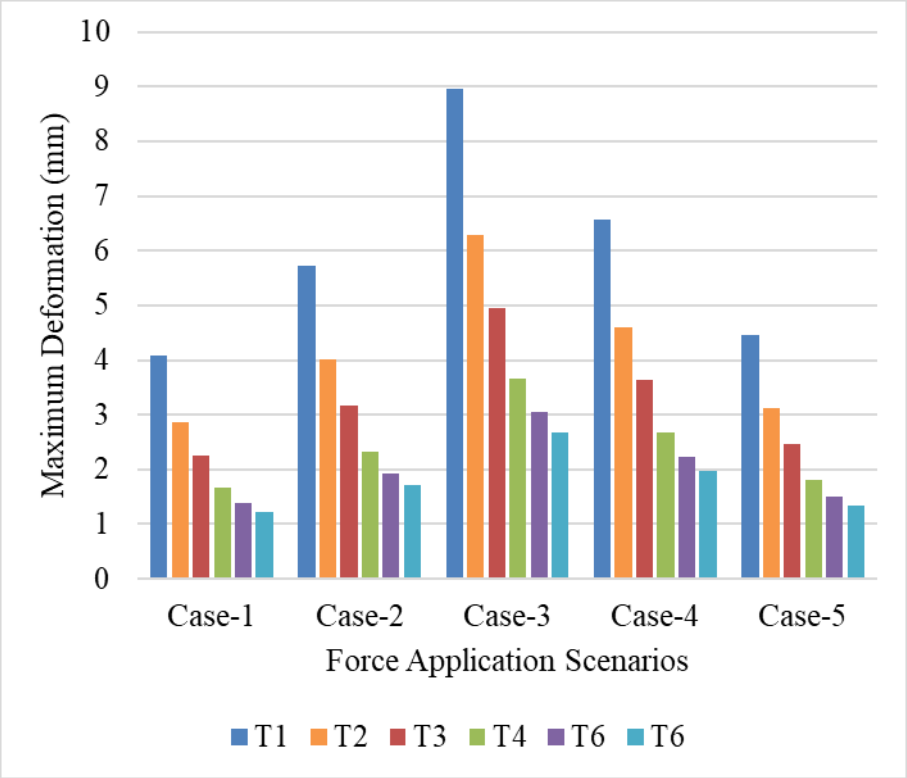


Figure 6. Maximum deformation values obtained for all force application scenarios (Cases 1–5) and wall thickness (T1-T6). (Cases 1–5 and T1–T6 are defined in Tables 4 and 1, respectively.)

The variation of maximum total deformation values with loading scenarios is presented in Figure 6. When the findings are examined, it is seen that the highest deformation occurs in the scenario of a concentrated force application at the centre region, i.e., Case-3. A significant increase in displacement values compared to other loading scenarios indicates that the location of the load has a decisive influence on the deformation behaviour. The single vertical force applied from the central region makes the bending behaviour more pronounced and causes the maximum displacement to be concentrated in the middle region. This behaviour is consistent with the decisive effect of loading position on bending deformation in beam-like elements (Khalaf et al., 2022). In the other scenarios where the load is distributed to different points, the magnitudes of displacements are limited due to the spreading of the forces to a larger number of areas and the deformation patterns show a more balanced nature. This fact suggests that a concentrated load applied at the centre forms a more challenging condition for assessing the bending stiffness of the handrail tube, which in turn confirms Case-3 as a critical scenario in deformation analyses.

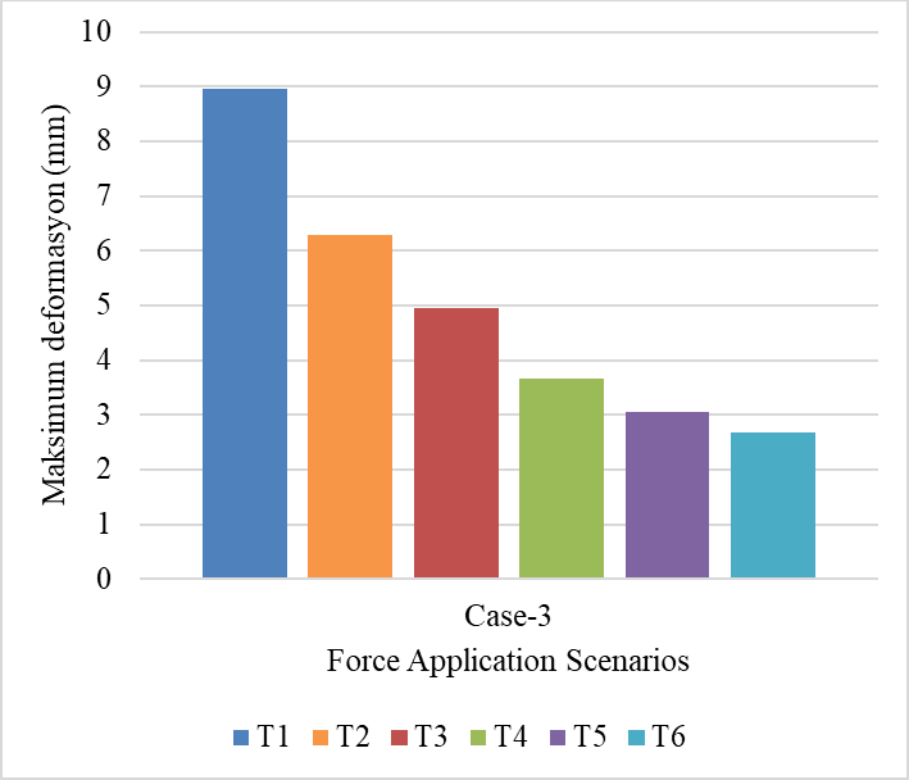


Figure 7. Maximum deformation values for the Case 3 loading scenario and different wall-thickness (T1-T6). (Cases 1–5 and T1–T6 are defined in Tables 4 and 1, respectively.)

The maximum total deformation values obtained for the Case-3 loading scenario are presented in Figure 7 to demonstrate the effect of wall thickness on structural stiffness. When the results are interpreted, it is found that the amounts of deformation increase with the reduction in wall thickness. At the thinnest cross-section of 1.0 mm wall thickness maximum total deformation was calculated to be in the ballpark of 9 mm. In this case, due to the fact that maximum stress exceeds the yield strength, the 1.0 mm wall thickness is not considered suitable from the point of view of elastic working conditions. However, in the model with 1.5 mm wall thickness total deformation has dropped roughly to the 6 mm level and it has also been found that under the same situation, the maximum von Mises stress is below the yield strength. This result does not mean that 1.5 mm wall thickness absolutely provides an upper bound in terms of deformation, but if the stress criterion is also taken into account, it indicates a very significant alternative which has potential for weight reduction as compared to the reference design

As shown in Figure 7, the increase in wall thickness creates a nonlinear but continuous decreasing trend in the amount of deformation. A distinctly marked reduction in deformation values is observed, particularly at the transition between 1.0 mm and 1.5 mm, while it can be seen that the improvement obtained in higher thicknesses is gradually diminishing. This situation confirms that increasing the wall thickness has a beneficial effect on stiffness; however, beyond a certain level, the additional deformation gain is limited. The results obtained are also consistent with the stiffness-deformation relationship reported in the literature (Khalaf et al. 2022) for circular hollow steel sections. Therefore, in wall thickness selection, rather than focusing only on the very lowest deformation value, it is a more rational approach to also take into consideration structurally the contribution of structural deformation improvement together with the mass change. Optimisation studies (Lan et al., 2004; Gauchia et al., 2010; Li et al., 2019) on vehicle structures and grab elements also emphasise that structural performance and mass criteria should be evaluated together.

Since in this study there has not been a definition of a numerical upper limit for total deformation based on a standard, regulation or company specification, the deformation results have not been used as an independent acceptance-rejection criterion but as a comparative stiffness behaviour evaluation of different wall thickness scenarios. In this respect, 1.0 mm wall thickness was not considered acceptable since it does not satisfy the yield strength criterion. The 1.5 mm wall thickness, on the other hand, was evaluated as a prominent alternative scenario because it remained within the elastic limit in terms of maximum von Mises stress, exhibited lower deformation than the 1.0 mm scenario, and offered weight reduction potential compared with the current 2.0 mm reference design. Along with that, the final choice of wall thickness should not be decided solely on deformation behaviour; instead, stress, comparative stiffness behaviour, and weight change should be considered together.

3.3. Weight Evaluation

Stress and deformation analyses have exposed the effects of different sheet thickness scenarios on structural safety and stiffness behaviour, yet in the final design assessment, the change of weight also needs to be considered. Particularly for interior fittings and grab rail elements that are used repeatedly in urban buses, weight reduction achieved at the component level can provide significant lightweighting potential in terms of total vehicle mass. For this reason, weight analysis has been considered in this study not only as a geometric output but also as one of the fundamental design parameters that ought to be evaluated in conjunction with the stress safety and deformation behaviour. Research on vehicle body structures (Lan et al., 2004; Gauchia et al., 2010) points out that the weight reduction should be carried out with the preservation of strength and stiffness requirements. In a structural optimisation of hand-holding elements done by Li et al. (2019), it is shown that strength and mass criteria should be evaluated together. In this context, the T3 model with a 2.0 mm thickness used in the existing vehicle application was accepted as a reference design and the weight changes of other thickness scenarios were compared with this reference.

The weight results (Figure 8) have been acquired by using the volume values calculated for each thickness scenario and the density value of St37 steel. The weight of the reference T3 model has been calculated as 2,354 kg. On the other hand, the weight of the T1 model with 1.0 mm thickness has dropped to the level of 1,219 kg, and approximately 48.2% weight reduction has been obtained with respect to the reference design. However, as the maximum von Mises stress in the T1 scenario exceeds the yield strength of St37 steel, this weight advantage does not constitute a structurally safe design alternative. In the case of the T2 model with 1.5 mm thickness, the weight has been calculated as 1,798 kg, and approximately 23.7% weight reduction has been achieved with respect to the reference design. The fact that the T2 scenario remains within the elastic limit in terms of maximum von Mises stress and stands out in comparative rigidity assessment in terms of deformation is turning this thickness into a notable weight reduction alternative.

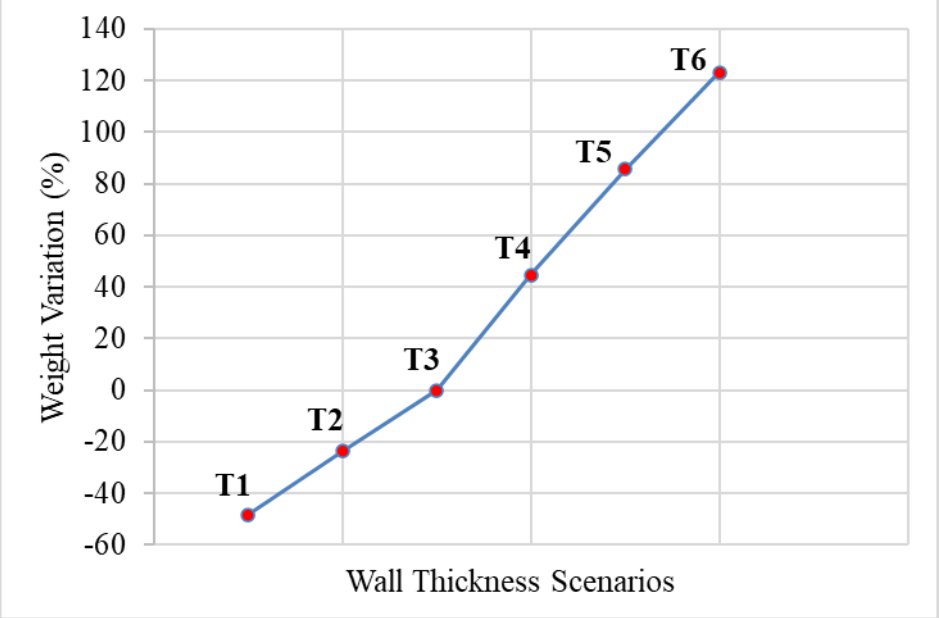


Figure 8. Weight variation of the grab rail tube for different wall thickness scenarios.

In the T4, T5, and T6 scenarios, which have higher wall thicknesses than the reference design, the component weight was observed to increase considerably. In the case of T4 with 3.0 mm thickness, the weight has been calculated as 3,406 kg and the increase has been around 44.6% with respect to the reference design. Likewise, in the case of T5 with 4.0 mm thickness, the weight has climbed to the level of 4,373 kg, and the weight increase has been approximately 85.7%. In the highest thickness of 5.0 mm scenario, weight has been calculated as 5,256 kg and there has been around 123.2% increase with respect to the reference design. These results illustrate that even though the increase in thickness brings about improvement in stress and deformation values, it results in a significantly high weight disadvantage. Generally speaking, even though the T1 scenario provides the highest weight reduction, it has been discarded due to its failure in meeting the yield strength; while the T4, T5 and T6 scenarios have not been considered as effective alternatives from the point of view of the light-weighting goal due to their obvious weight increases. For this reason, the T2 scenario with 1.5 mm thickness comes forward as one of the most balanced alternatives when structural safety, comparative stiffness behaviour, and weight reduction potential are taken into consideration together.

3.4. Combined Evaluation of Stress, Deformation and Weight Results

When the stress, deformation, and weight analyses are evaluated together, it is evident that the tube wall thickness is a decisive design variable affecting both the structural performance and lightweighting potential of the grab rail tube. Reducing the wall thickness decreases the component weight; however, below a certain level, this reduction may create a disadvantage in terms of structural safety. This is most clearly seen in the T1 scenario. Although the T1 model with 1.0 mm thickness provides the highest weight reduction in comparison to the reference design, it does not meet the elastic limit criterion since the maximum von Mises stress exceeds the yield strength of the St37 steel. On the other hand, the T4, T5 and T6 scenarios where thicknesses are increased have lowered stress and deformation values; however, this improvement was accompanied by a significant weight increase. For this reason, scenarios with high thickness, although beneficial in terms of structural stiffness only, were not considered as effective design alternatives from the point of view of the weight reduction goal.

Among the alternatives investigated, the T2 scenario stands out as one of the most balanced options in terms of structural performance and weight reduction. The T2 model, with a wall thickness of 1.5 mm, remained within the elastic limit in terms of maximum von Mises stress, exhibited a more balanced behaviour than the T1 scenario in the comparative stiffness assessment based on the deformation results, and provided a weight reduction of approximately 23.7% compared with the current 2.0 mm reference design. This result indicates that in the design of the grab rail tube, it is not enough to focus only on the lowest stress or lowest deformation value; rather, the criteria of structural safety, stiffness behaviour, and mass reduction should be evaluated together. In the structural optimisation works reported in the literature (Meng et al., 2023; Rutsch et al. 2025), it is stated that stress levels, deformation, stiffness requirements and structural performance under different loading conditions are considered as the main evaluation criteria when developing design lightening solutions. Therefore, the T2 scenario, in terms of the loading conditions and evaluation criteria of this study, can be considered as a viable alternative with a potential for light-weighting compared to the existing reference design.

4. Conclusions

In this article, the structural behaviour of a one-piece grabrail tube used in urban buses under various wall thicknesses has been investigated by using the finite element method. For the grabrail tube with the same outer geometry, six different wall thickness scenarios 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 mm were created and each scenario was examined under five different force application scenarios. Thus, the maximum von Mises stress, total deformation, and weight changes over 30 different loading scenarios were investigated comparatively.

The results obtained indicated that the tube wall thickness is a decisive design variable in structural safety, stiffness behaviour, and weight reduction potential of the grabrail tube. In the stress analyses, the most critical loading scenario was found to be Case-5 with a single force applied from the right side. In this scenario, the maximum von Mises stress of the T1 model with 1.0 mm wall thickness exceeded the 235 MPa yield strength of St37 steel and therefore, the T1 scenario was not suitable from the point of view of the elastic limit criterion. On the other hand, it was found that the maximum von Mises stresses of the wall thickness scenarios 1.5 mm and above remained within the elastic limit.

In the deformation analyses, it was seen that the highest total deformation values occur in the centre single force applied Case-3 scenario. This finding illustrates that the deformation behaviour of the grabrail tube is sensitive to the loading position, and the single load applied from the centre is a more challenging condition in terms of bending stiffness. Since there is no numerical upper limit based on standard, regulation, or company specifications for total deformation, the deformation results were not used as a separate accept-reject criterion but used as a basis for the comparison of different wall thickness scenarios in terms of stiffness behaviour.

Weight analyses showed that a substantial weight reduction potential was realised by reducing the wall thickness. The weight of the T3 model with a wall thickness of 2.0 mm, which was assumed as the reference design, was calculated as 2.354 kg. The T1 model with 1.0 mm wall thickness, although providing a weight reduction of about 48.2% compared to the reference design, has not been considered as a proper alternative because it did not satisfy the yield strength criterion. On the other hand, the T2 model with 1.5 mm wall thickness maintained the differences in maximum von Mises stress within the elastic limit, provided a weight reduction of about 23.7% compared to the reference T3 design, and met the yield strength criterion. Although there were decreases in the stress and deformation values in T4, T5, and T6 scenarios where the wall thickness is increased, this improvement took place in the close presence of a remarkable weight increase. The weight increase in the models with 3.0, 4.0 and 5.0 mm wall thickness is at approximately 44.6%, 85.7%, and 123.2% levels, respectively, illustrating that these scenarios are not effective design alternatives in terms of the light-weighting target.

When it is assessed in a general sense, the T2 scenario with 1.5 mm wall thickness was considered as one of the most balanced alternatives; maximum von Mises stress remained within the elastic limit, at the same time

deformation results were among the candidates for the comparative stiffness evaluation, and weight reduction was about 23.7% with respect to the reference design. These findings imply that focusing only on strength or stiffness criteria in the grabrail tube design is not sufficient; structural safety, comparative stiffness behaviour, and mass reduction criteria need to be evaluated together.

Acknowledgement

The author gratefully acknowledges Karsan Automotive Industry and Trade Inc. for providing the necessary support and resources during the preparation and completion of this study.

References

1. Edwards M, Appleby J, Venkateswaran K, Robinson B, Edwards A, Martin P, McCarthy M. The Transport for London (TfL) Bus Safety Standard: Occupant Friendly Interiors; 2022.
2. United Nations Economic Commission for Europe. UN Regulation No. 107: Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction. Geneva: UNECE; 2021.
3. Palacio A, Tamburro G, O'Neill D, Simms C. K. Non-collision injuries in urban buses—strategies for prevention. Accident Analysis & Prevention. 2009;41(1): 1–9. DOI: 10.1016/j.aap.2008.08.016.
4. Lan F, Chen J, Lin J. Comparative analysis for bus side structures and lightweight optimization. Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering. 2004;218(10):1067–1075. DOI: 10.1177/095440700421801001.
5. Gauchia A, Diaz V, Boada MJL, Boada BL. Torsional stiffness and weight optimization of a real bus structure. International Journal of Automotive Technology. 2010;11(1):41–47. DOI: 10.1007/s12239-010-0006-4.
6. Khalaf, M.S.; Ibrahim, A.M.; Najm, H.M.; Hassan, A.; Sabri, M.M.S.; Alamir, M.A.; Alarifi, I.M. Evaluation and Prediction of the Bending Behavior of Circular Hollow Steel Tube Sections Using Finite Element Analysis. Materials 2022, 15, 3919. https://doi.org/10.3390/ma15113919.
7. Li Y, Zhang X, Zhi P. Robust optimization design of metro handrails. Journal of Shanghai Jiaotong University (Science). 2019;24:628–631. DOI: 10.1007/s12204-019-2119-x.
8. Uetake T, Shimoda M. Experimental study on the grip and hold strength for stanchions and handrails in buses. Journal of Human Ergology. 2006;35:11–19.
9. Peng Y, Xu T, Hou L, Fan C, Zhou W. An investigation of dynamic responses and head injuries of standing subway passengers during collisions. Applied Bionics and Biomechanics. 2018; 2018: 1096056. DOI: 10.1155/2018/1096056.
10. Seriani S, Aprigliano Fernandes V, Moraga P, Cortes F. Experimental location of the vertical handrail to improve the accessibility of wheelchair passengers boarding and alighting at metro stations—A pilot study. Sustainability. 2022;14(15):9224. DOI: 10.3390/su14159224.
11. [Holenko K, Koda E, Dykha O, Kernytskyy I, Horbay O, Chalecki M, et al. Evaluation of influence of the integrated welded handrail system in the bus body frame on strength and passive safety. Applied Sciences. 2026;16(6):3039. DOI: 10.3390/app16063039.
12. EN 1993-1-1:2005. Eurocode 3: Design of steel structures – Part 1-1: General rules and rules for buildings. European Committee for Standardisation (CEN), Brussels, Belgium, 2005.
13. EN 10025-2:2019. Hot rolled products of structural steels – Part 2: Technical delivery conditions for non-alloy structural steels. European Committee for Standardisation (CEN), Brussels, Belgium, 2019.
14. Thomas SJ, Zeni JA, Winter DA. Winter's Biomechanics and Motor Control of Human Movement. 5th ed. Hoboken, NJ: John Wiley & Sons; 2023.
15. European Commission. Commission Regulation (EU) No 1230/2012 of 12 December 2012 implementing Regulation (EC) No 661/2009 with regard to type-approval requirements for masses and dimensions of motor vehicles and their trailers. Official Journal of the European Union; 2012.
16. Timoshenko, S.P.; Gere, J.M. Theory of Elastic Stability. 2nd ed. New York: McGraw-Hill Book Company; 1961.

17. Malkus, D.S.; Plesha, M.E.; Witt, R.J. Concepts and Applications of Finite Element Analysis. 4th ed. New York: John Wiley & Sons; 2002.
18. ANSYS. What Is Equivalent Stress? 2023.
19. Meng, X., Sun, Y., He, J., Li, W., & Zhou, Z. (2023). Multi-objective lightweight optimization design of the aluminium alloy front subframe of a vehicle. Metals, 13(4), 705. doi:10.3390/met13040705
20. Rutsch, F., Fina, M., & Freitag, S. (2025). Structural topology optimization with simultaneous stress and displacement constraints considering multiple load cases. Structural and Multidisciplinary Optimization, 68, 48. doi:10.1007/s00158-024-03954-0

The Effects of Fertility and Higher Education Enrollment on Employment in Turkey: An ARDL Analysis for the Period 2001–2022

Yaren TOZOĞLU[64], Hakan EYGU[65]

Abstract

This study examines the relationship between employment, fertility, and higher education enrollment rates in Turkey using annual data from 2001 to 2022. The study considers the employment rate as the dependent variable and the total fertility rate and higher education enrollment rate as independent variables. ADF and PP unit root tests were applied to determine the stationarity properties of the series, and the ARDL boundary test approach was utilized to identify the long-term relationship among the variables. The findings indicate the presence of a long-term cointegration relationship among the variables. According to the long-run coefficient results, it was determined that the higher education enrollment rate has a positive and statistically significant effect on employment. It was concluded that the fertility rate has a negative effect on employment, but this effect is not statistically significant. In this regard, it can be stated that increasing access to higher education in Turkey serves as a supportive factor for employment.

Keywords: Employment, fertility, higher education, ARDL boundary test, Turkey.
JEL Codes: J21, J13, I23, C32

[64] Master's degree candidate, Atatürk University, Institute of Social Sciences, yarentozoglu7@gmail.com
ORCID No: 0009-0001-9893-0710
[65] Prof. Dr. Hakan EYGU, Atatürk University, Faculty of Economics and Administrative Sciences, Department of Econometrics, hakaneygü@atauni.edu.tr, ORCID No: 0000-0002-4104-2363

1. Introduction

Employment is one of the key macroeconomic indicators that countries prioritize in terms of economic growth, income distribution, and social welfare. The effective utilization of an economy's production capacity is closely linked to the level of labor force employment. Therefore, identifying the economic and demographic factors influencing employment is of great importance to policymakers.

Educational attainment and fertility rates are among the key variables influencing employment. In particular, increased access to higher education contributes to greater employment in the labor market by enhancing individuals' knowledge and skills. Conversely, changes in fertility rates can have significant effects on labor supply and labor force participation.

In Turkey, while enrollment rates in higher education have increased in recent years, a downward trend in fertility rates has been observed. Identifying the effects of these changes on employment is crucial for shaping education and labor market policies.

The aim of this study is to examine the effects of fertility rates and higher education enrollment rates on employment in Turkey during the 2001–2022 period. In this context, the stationarity properties of the variables were analyzed using ADF and PP unit root tests, and the long-term relationship between the variables was investigated using the ARDL boundary test approach.

2. Literature

Studies examining the relationship between employment, education, and demographic indicators constitute an important part of economic literature. Numerous studies have demonstrated that educational attainment positively affects employment by enhancing the quality of the labor force. According to Human Capital Theory, education increases individuals' productivity, skills, and earning potential, thereby improving their employment opportunities in the labor market (Becker, 1964; Mincer, 1974). Similarly, Schultz (1961) emphasized that investment in education and human capital contributes significantly to both individual productivity and economic development.

Empirical studies also indicate that educational attainment generates substantial economic returns. Psacharopoulos and Patrinos (2018) found that investment in education improves labor market outcomes and increases individuals' employment opportunities. Therefore, higher education is considered one of the most important factors supporting long-term employment growth.

Studies examining the relationship between fertility and employment indicate that changes in

fertility rates have significant effects on labor supply and labor force participation. In particular, declining fertility rates are often associated with rising educational attainment and increasing labor force participation. Bloom, Canning and Sevilla (2003) argued that demographic changes, including fertility dynamics, may substantially influence labor market structures and economic performance.

Research conducted on Turkey has also highlighted the importance of education and demographic factors in shaping labor market outcomes. Tansel (2002) emphasized the role of educational attainment in improving labor market opportunities, while Dayıoğlu and Kırdar (2010) examined the determinants of labor force participation and demonstrated the significance of demographic and socioeconomic factors in employment dynamics.

Overall, the literature suggests that education and fertility are among the key determinants of employment. While higher education contributes to labor market participation through human capital accumulation, fertility-related demographic changes may influence employment through their effects on labor supply. Therefore, analyzing these variables jointly provides a more comprehensive understanding of employment dynamics.

This study contributes to the existing literature by examining the effects of fertility rates and higher education enrollment rates on employment in Turkey during the 2001–2022 period using the ARDL bounds testing approach.

3. Method

3.1. Model and Data Set

This study examines the relationship between employment, fertility, and higher education enrollment rates in Turkey using annual data from 2001 to 2022. The data used in the study were obtained from the World Development Indicators database of the World Bank (2024) and the official statistics published by the Turkish Statistical Institute (TÜİK, 2024). In the analysis, the employment rate was used as the dependent variable, while the total fertility rate and the higher education enrollment rate were used as independent variables. The variables used in the analysis and their descriptions are provided in Table 1.

Table 1. Data Set and Variable Descriptions

Variables	**Representative Variables**	**Description**	**Source**
Employment Rate	lnIST	Total employment rate (%)	World Bank
Fertility Rate	lnDOG	Total fertility rate	World Bank

Higher Education Enrollment Rate	lnYK	Gross enrollment rate in higher education (%)	TÜİK/World Bank

In this study, the stationarity properties of the series were first examined using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. The ARDL boundary test approach was used to determine the long-run relationship between the variables. Additionally, an error correction model (ECM) was constructed to examine short-term dynamics, and the model's validity was assessed using various diagnostic tests.

The logarithmic model used in the study is formulated as follows:

$$lnIST_t = \beta_0 + \beta_1 lnDOG_t + \beta_2 lnYK_t + u_t$$

Here, lnIST represents the employment rate, lnDOG represents the fertility rate, and lnYK represents the higher education enrollment rate. The β coefficients indicate the effects of the relevant variables on employment, while u_t represents the error term.

3.2. Stationarity Analysis

To obtain reliable results in time series analysis, it is first necessary to determine whether the series are stationary. Analyses conducted on non-stationary series may result in spurious regression, and the reliability of the obtained results may be compromised. Therefore, it is important to examine the stationarity properties of the variables before beginning econometric analyses.

In this study, the Augmented Dickey-Fuller (ADF) unit root test developed by Dickey and Fuller (1979) and the Phillips-Perron (PP) unit root test proposed by Phillips and Perron (1988) were applied to determine the stationarity properties of the series. The hypotheses used in the ADF and PP unit root tests are as follows:

H_0: The series is non-stationary (contains a unit root).
H_1: The series is stationary (does not contain a unit root).

Table 2. Unit Root Analysis Results

	Model	**ADF**		**PP**	
		At the level	**First Difference**	**At the level**	**I. Difference**
logIST	C	-1.5321 (0.498)	-3.254 (0.031**)	-1.532 (0.498)	-3.265 (0.031**)
	CT	-3.847 (0.037**)	-2.144 (0.098*)	-1.919 (0.608)	-3.096 (0.133)

	NCT	0.584 (0.834)	- 3.271 (0.003***)	0.584 (0.834)	-3.287 (0.002***)
logDOG	C	-0.619 (0.844)	-2.742 (0.084*)	-0.178 (0.927)	-2.851 (0.069*)
	CT	-0.293 (0.997)	-3.922 (0.030**)	-0.297 (0.984)	-4.065 (0.023**)
	NCT	-0.582 (0.452)	-2.744 (0.008***)	-1.248 (0.187)	-2.826 (0.007***)
logYK	C	-0.814 (0.794)	-1.717 (0.407)	-0.724 (0.819)	-3.585 (0.016**)
	CT	-0.546 (0.971)	-3.634 (0.049**)	-1.049 (0.914)	-3.643 (0.051*)
	NCT	0.391 (0.786)	-0.401 (0.525)	5.891 (0.999)	-0.798 (0.357)

According to the ADF and PP unit root test results presented in Table 2, the level values of the logIST, logDOG, and logYK variables are found to be non-stationary. However, it was determined that these variables become stationary when their first differences are taken. The findings indicate that the series are integrated at the I(1) level.

The fact that the variables are integrated of the same order allows for the investigation of a long-term relationship between them. Accordingly, in the next stage of the study, the existence of a cointegration relationship between the variables was examined using the ARDL boundary test approach.

3.3. ARDL Boundary Test

After determining that the series are stationary at the I(1) level, the ARDL boundary test approach was applied to investigate the long-term relationship between the variables. Before estimating the ARDL model, it is necessary to determine the appropriate lag length. For this purpose, the LR, FPE, AIC, SC, and HQ information criteria were utilized.

Table 3. Determination of the Appropriate Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	90,98299	NA	1.91e-08	-9,261368	-9,112246	-9,236130
1	174,2940	NA	7,79e-12	-17,08358	-16,48710	-16,98263
2	188,3339	17,73450*	5,01e-12*	-17,61409*	-16,57024*	-17,43743*
3	192,7408	4,174975	1.04e-11	-17,13061	-15,63939	-16,87823

Upon examining Table 3, it is observed that the majority of the information criteria indicate a lag length of 2 as the appropriate lag length. Accordingly, the optimal lag length for the model was determined to be 2, and subsequent analyses were conducted using this lag structure.

After selecting the most appropriate model using the Akaike Information Criterion (AIC), an ARDL boundary test was applied to investigate the presence of a long-run relationship among the variables.

Table 4. ARDL Bounds Test Results

F-statistic: 15.936		
H_0 : There is no cointegration relationship between the series.		
Critical Value Limits		
Significance Level	**Lower Limit I(0)**	**Upper limit I(1)**
10%	3.17	4.14
5%	3.79	4.85
2.5%	4.41	5.52
1%	5.15	6.36

According to the ARDL boundary test results presented in Table 4, the calculated F-statistic value is greater than the upper-bound critical values established by Pesaran et al. (2001). Therefore, the null hypothesis (H_0) stating that "there is no cointegration relationship between the series" is rejected.

The findings indicate the presence of a long-run cointegration relationship among the variables of employment, fertility, and higher education enrollment rate. In other words, these variables move together in the long run and exhibit a stable relationship. Based on this result, it becomes possible to estimate the long-run coefficients and examine the short-run dynamics.

3.4. Long-Run Relationship

Following the determination of a cointegration relationship among the variables via the ARDL boundary test, the long-run coefficients were estimated. The results of the long-run coefficients are presented in Table 5.

Table 5. Long-Run Coefficients

Variable	**Coefficient**	***t*-statistic**	***p*-value**
logDOG	-0.188	0.724	0.789
logYK	0.266	25.429	0.007^{***}

Upon examining Table 5, it is observed that the logYK variable, representing the higher education enrollment rate, has a positive and statistically significant effect on employment ($\beta=0.266$, $p<0.01$). This result indicates that increases in the higher education enrollment rate lead to higher employment in the

long term. In other words, rising educational attainment improves the quality of the labor force, thereby positively affecting individuals' likelihood of being employed.

The coefficient of the logDOG variable, representing the fertility rate, was found to be negative (β = -0.188). However, this effect is not statistically significant ($p > 0.05$). This indicates that while changes in the fertility rate may have a negative impact on employment, this effect is not statistically supported.

Overall, the long-term analysis results reveal that higher education enrollment rates are a significant factor supporting employment in Turkey, while the fertility rate's effect on employment is not statistically significant.

3.5. Short-Term Relationship and Error Correction Model (ECM)

An ARDL error correction model (ECM) was estimated to examine the short-term relationships between variables. The results regarding the short-term coefficients are presented in Table 6.

Table 6. Short-Term Relationship and Error Correction Model (ECM)

Variable	**Coefficient**	**t-statistic**	**p-value**
Δ(logDOG)	0.909	1.894	0.098*
Δ(logDOG(-1))	0.347	0.321	0.759
Δ(logDOG(-2))	-0.756	-0.677	0.523
Δ(logYK)	-0.314	-1.024	0.344
Δ(lnRELC(-1))	-0.158	-0.324	0.755
Δ(lnRELC(-2))	-0.602	-2.129	0.073*
CoinEq(-1)	4.910	2.204	0.069*
R^2= 0.801		*DW* = 2.445	

Upon examining the results in Table 6, it is observed that changes in the fertility rate have a positive effect on employment in the short term. The coefficient of the Δ(logDOG) variable is 0.909 and is statistically significant at the 10% significance level. Accordingly, increases in the fertility rate have a positive effect on employment in the short term.

Although the coefficient of the Δ(logYK) variable, which represents the higher education enrollment rate, is negative, it is not statistically significant. Similarly, the majority of the lagged difference values for fertility and the higher education enrollment rate do not yield significant results. However, the Δ(lnRELC(-2)) variable was found to be significant at the 10% significance level and was

determined to have a negative effect on employment.

The coefficient of the error correction term, CoinEq(-1), was found to be positive and statistically significant at the 10% significance level. Although the coefficient indicates the existence of a long-run relationship among the variables, its positive sign suggests that short-run deviations from equilibrium may not converge back to the long-run equilibrium path. Therefore, the adjustment mechanism does not exhibit the expected error-correcting behavior, and this finding should be interpreted with caution.

The R^2 value of 0.801, which indicates the model's explanatory power, shows that the independent variables explain approximately 80% of the variation in employment. Additionally, the Durbin-Watson statistic of 2.445 indicates that there is no significant autocorrelation problem in the model.

3.6. Model Assumptions and Diagnostic Tests

To ensure that the results obtained from econometric models are reliable and consistent, it is necessary to examine whether the model assumptions are met. For this purpose, various diagnostic tests regarding serial correlation, heteroskedasticity, and specification error were applied to the model.

3.6.1. Serial Correlation Test

The Breusch-Godfrey LM test was applied to determine whether there is autocorrelation among the error terms in the model. The results are presented in Table 7.

Table 7. Serial Correlation Test Results

F-statistic	0.651	p-value F(2,14)	0.539
R^2value	1.957	Chi-Square	0.375

Upon examining Table 7, it is observed that the probability values obtained for the Breusch-Godfrey LM test are greater than the 5% significance level. Therefore, the null hypothesis stating that "there is no serial correlation in the model" cannot be rejected. Consequently, it can be concluded that there is no autocorrelation problem in the model.

3.6.2. Heteroskedasticity Test

The Breusch-Pagan-Godfrey test was applied to investigate the presence of a heteroskedasticity problem in the model. The test results are presented in Table 8.

Table 8. Results of the Heteroskedasticity Test

F-statistic	1.241	p-value F(5,14)	0.3416
R^2value	6.144	Chi-Square	0.2924

3.6.3. Ramsey RESET Test

The Ramsey RESET test was applied to test the validity of the model's functional form. The test results are presented in Table 9.

Table 9. Ramsey RESET Test Results

	Value	Probability
t-statistic	0.0774	0.943
F-statistic	0.006	0.943

The fact that the probability value obtained from the Ramsey RESET test is greater than the 5% significance level indicates that the model's functional form was correctly selected. In other words, there is no significant specification error in the model.

Overall, the results of the diagnostic tests applied indicate that the model's basic assumptions are met and that the obtained estimation results are reliable.

4. Conclusion

In this study, the effects of the fertility rate and higher education enrollment rate on employment in Turkey were examined using annual data from the 2001–2022 period. Within the scope of the analysis, the stationarity properties of the variables were first investigated using ADF and PP unit root tests, and it was determined that the series were stationary in their first differences. Subsequently, the ARDL boundary test approach was applied to identify the long-run relationship among the variables.

The results of the ARDL boundary test indicate the presence of a long-run cointegration relationship among the variables of employment, fertility, and higher education enrollment rate. This result demonstrates that the variables in question move together in the long run and that a stable relationship exists between them.

According to the long-run coefficient results, it was determined that the higher education enrollment rate has a positive and statistically significant effect on employment. This finding suggests that increased access to higher education supports employment by enhancing the quality of the labor force. In contrast, the effect of the fertility rate on employment was found to be negative; however, it was concluded that this effect is not statistically significant.

The results of the short-term analysis, however, indicate that changes in the fertility rate have a short-term effect on employment. Additionally, the error correction term was found to be statistically significant. However, since its coefficient is positive, the adjustment mechanism does not indicate the expected convergence toward the long-run equilibrium. Therefore, the short-run dynamics of the model should be interpreted with caution.

The serial correlation, heteroskedasticity, and Ramsey RESET tests conducted to assess the model's reliability confirmed that the model's fundamental assumptions hold. This indicates that the obtained estimation results are statistically reliable.

Based on these findings, it can be argued that when developing policies to increase employment in Turkey, priority should be given to initiatives aimed at expanding access to higher education and improving the quality of education. An increase in educational attainment will support the supply of skilled labor required by the labor market, leading to positive outcomes for employment in the long term. However, to more comprehensively assess the effects of demographic changes on the labor market, it would be beneficial to include additional variables in future studies.

References

Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. New York: Columbia University Press.

Dayıoğlu, M., & Kırdar, M. G. (2010). Determinants and Trends in Women's Labor Force Participation in Turkey. *Publications of the State Planning Organization*.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366), 427–431.

Mincer, J. (1974). *Schooling, Experience, and Earnings*. New York: Columbia University Press.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326.

Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335–346.

Tansel, A. (2002). Determinants of school attainment of boys and girls in Turkey: Individual, household, and community factors. *Economics of Education Review*, 21(5), 455–470.

Bloom, D. E., Canning, D., & Sevilla, J. (2003). The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change. Santa Monica, CA: RAND Corporation.

Psacharopoulos, G., & Patrinos, H. A. (2018). Returns to Investment in Education: A Decennial Review of the Global Literature. Education Economics, 26(5), 445–458.

Schultz, T. W. (1961). Investment in Human Capital. The American Economic Review, 51(1), 1–17.

Turkish Statistical Institute (TÜİK). (2024). *Employment Statistics*. Ankara: TÜİK.

World Bank. (2024). *World Development Indicators Database*. Washington, DC: The World Bank. Retrieved from https://data.worldbank.org

THE GLOBAL FERTILITY CRISIS: CAUSES, CONSEQUENCES, AND MULTIDIMENSIONAL POLICY APPROACHES

Yasemin Yıldız* Zekiye TURAN**

Abstract

Aim: The fertility rate is one of the fundamental elements determining the demographic structure of a country and plays a critical role in predicting future population dynamics. Global fertility rates have shown a continuous and universal decline over the past seventy years. Many countries have permanently fallen below the replacement level necessary for population renewal. This paper examines the multifaceted causes of this crisis, its increasingly severe consequences, and potential policy options. The main objective of this study is to conduct a detailed examination of the increasingly pronounced global decline in fertility and to discuss the multifaceted causes of this phenomenon.Method: The literature review for this compilation was conducted between 1st of January and 7th of February, 2026. Major academic databases, including PubMed, Google Scholar, DergiPark, and Science Direct, were utilized to access current and relevant publications. The screening process focused on socioeconomic, cultural, and political factors explaining the decline in fertility rates, employing keywords such as fertility rate declines, family policies, and gender inequality.Findings:According to the United Nations' "World Population Prospects" (2022) report, the global population growth rate has fallen below 1% annually for the first time since 1950. The global total fertility rate declined from 3.3 births per woman in 1990 to 2.3 in 2021 and is projected to fall to approximately 2.1 by 2050. These trends indicate a slowing population growth rate and increasing population aging.Conclusion and Recommendations: The rapid decline in global fertility rates is not merely a demographic phenomenon but constitutes a multifaceted crisis with economic, social, and cultural dimensions. The proliferation of nuclear families, rising divorce rates, increasing individualization, and the redistribution of the elderly care burden are weakening traditional family models and necessitating the redesign of social policies. In this context, states should not limit themselves solely to pronatalist policies aimed at increasing birth rates. They must also develop multidimensional policy approaches that strengthen intra-family solidarity, reduce economic uncertainties, and prioritize social justice.

Keywords: The Decline of Fertility Rates, Family Policies, Gender Inequality.

1. INTRODUCTION

The world is currently undergoing an unprecedented demographic transformation (UNFPA, 2025). This transformation is characterized by a marked, widespread, and persistent decline in fertility rates. Over the past seventy years, this trend has been observed globally and has evolved into a universal phenomenon, no longer confined to high-income countries but extending to middle- and low-income nations as well (Fauser et al., 2024).

The decline in the total fertility rate (TFR) has been so dramatic that even highly industrialized countries—including China and the "Tiger" economies of Southeast Asia—are projected to experience significant population contraction in the coming decades (Aitken, 2024).

This development signifies that many countries have permanently fallen below the fertility level required for population replacement, a condition now defined as the "global fertility crisis" (Carneiro, 2025). Nevertheless, in certain regions this decline has been interrupted, with fertility rates temporarily stabilizing or slowing—a phenomenon referred to in the literature as a "fertility stall" (Grimm et al., 2022).

Moreover, unexpected fertility declines observed in Scandinavian countries over the past decade have been closely associated with dynamics of gender equality and social stratification (Lappegård, 2020).

---

2. METHOD

The literature review for this study was conducted between January 1 and February 7, 2025. To access current and relevant publications, the major academic databases **PubMed, Google Scholar, DergiPark, and Science Direct** were utilized. During the screening process, the focus was placed on socioeconomic, cultural, and political factors explaining the decline in fertility rates. The keywords employed included **fertility rate declines, family policies, and gender inequality**.

3. FINDINGS

3.1. Multifaceted Causes of Fertility Decline

The decline in fertility cannot be attributed to a single cause; rather, it represents the cumulative outcome of complex, multilayered, and interrelated structural factors (Fauser et al., 2024).

3.1.1. Socioeconomic and Structural Pressures

The extension of women's educational trajectories and the rising rate of female labor force participation have led to profound changes in fertility behavior. In particular, career development in highly skilled

professions has resulted in the postponement of childbearing decisions (Fauser et al., 2024). Consequently, in many countries the age at first childbirth has shifted into the thirties. Although this delay enhances women's educational and professional opportunities, it creates a significant conflict with biological limitations (Aitken, 2024).

Economic uncertainty further complicates decisions regarding family formation. Rising housing costs, the heavy financial burden of childrearing, and unstable labor markets constitute the primary structural factors that compel young adults to adopt a cautious approach to family planning (Fauser et al., 2024). Moreover, poverty, precarious employment, and high living expenses render family formation—or the expansion of existing families—practically impossible for many individuals (UNFPA, 2025).

3.1.2. Gender Inequality and the Care Burden

Fertility decisions are strongly influenced by gender inequality. Women disproportionately assume the majority of unpaid care work, and this significantly constrains their reproductive choices (UNFPA, 2025). The perception that having a family and children negatively affects women's careers is widespread, and this view is supported by the work of Nobel laureate Claudia Goldin (Carneiro, 2024). Many women returning to the workforce lack access to adequate childcare services or parental leave to care for a sick child. These conditions force women into a difficult choice between career and family. Indeed, the fertility declines observed in Scandinavian countries over the past decade have been linked to the persistence of imbalances between women's labor force participation and men's domestic responsibilities (Lappegård, 2020). Furthermore, in societies where the care burden is not shared equally, fertility transitions tend to slow, triggering stagnation processes referred to as "fertility stalls" (Grimm et al., 2022).

3.1.3. Cultural Transformation of Values

Changing social norms have weakened expectations regarding marriage, parenthood, and the ideal family size. Today, individual fulfillment, career advancement, and quality of life have become more decisive factors in childbearing decisions. A child-free lifestyle is now regarded in many societies as a legitimate and socially accepted choice (Fauser et al., 2024). Indeed, the report by the International Children's Center and Başkent University's Women-Child Health and Family Planning Research and Application Center (UÇM & BÜKÇAM, 2021) demonstrates that structural issues such as early marriage, unintended pregnancies, and unsafe abortions directly affect individuals' reproductive preferences. Furthermore, inequalities in women's educational attainment and access to healthcare reveal that the transformation of

cultural values is shaped not only by individual choices but also by broader social conditions (Soysal, Özcan & Akın, 2022).

3.1.4. Biological Realities and Threats to Reproductive Health

The decline in fertility with advancing age directly conflicts with the postponement of childbearing decisions (Fauser et al., 2024). Humans are among the rare species in which reproductive capacity is sharply reduced in midlife due to the steep decline in female fertility (Aitken, 2024). This situation has led to rising infertility rates and increasing dependence on assisted reproductive technologies (ART). However, despite the fact that infertility affects one in six individuals worldwide, diagnostic and treatment opportunities remain limited and costly (Carneiro, 2025; Carneiro, 2024). Reproductive health is also seriously threatened by lifestyle and environmental factors such as obesity, exposure to environmental toxins, micro- and nanoplastics, and the globally observed decline in sperm counts (Aitken, 2024).

3.2. The Gap Between Individual Preference and Structural Constraint

At the core of current debates lies the question of whether the decline in fertility is driven by individuals' unwillingness or by structural barriers. The UNFPA (2025) report conveys a clear message on this issue: although fertility rates have declined in many countries, this does not stem from people wanting fewer children. On the contrary, millions of individuals worldwide are unable to achieve the number of children they desire. This situation reflects not an absence of preference, but rather constraints imposed upon preference. Economic instability, climate change, armed conflicts, and pandemics threaten individuals' fundamental rights to determine when and how to form families (Carneiro, 2025). Recent data further demonstrate that structural barriers—such as inequalities in women's access to reproductive healthcare, early marriage, unsafe abortions, and unmet family planning needs—directly restrict fertility choices (Türkiye'de Cinsel Sağlık ve Üreme Sağlığı Durum Analizi, 2021). Therefore, the problem is not that people "want fewer children," but that they are unable to have the children they wish for.

3.3. Demographic and Economic Implications: An Aging World

Declining fertility rates precipitate rapid population aging. A diminishing working-age population constrains economic growth potential, while concurrently exerting severe pressure on the sustainability of pension systems and healthcare services (Fauser et al., 2024; Carneiro, 2024). Furthermore, the International Monetary Fund (IMF) and the World Economic Forum (WEF) acknowledge that the

collapse in birth rates, compounded by population aging, poses a "demographic disaster" risk capable of precipitating severe economic ramifications (Carneiro, 2024). Rather than being conceptualized as a crisis, population aging ought to be recognized as an inevitable reality that warrants strategic management through appropriate policy frameworks (UNFPA, 2025). Nonetheless, sub-replacement fertility rates persistently jeopardize national prosperity and the long-term viability of future generations over the secular horizon (Carneiro, 2025).

3.4. Policy Responses and Areas of Intervention

The decline in fertility rates constitutes a phenomenon of such complexity that it cannot be elucidated solely by individual preferences. Consequently, addressing this issue mandates multisectoral and long-term policies (Fauser et al., 2024). For instance, a study by Grimm et al. (2022) underscores that decelerations in the fertility transition are frequently associated with stagnations in socioeconomic development, thereby emphasizing the necessity of addressing education, health, and income policies in a coordinated manner. Correspondingly, Lappegård (2020) posits that the dynamics of gender equality and social stratification will determine future fertility trends; hence, care services, labor market regulations, and family policies must be designed to mitigate these inequalities. In this context, responses to the fertility crisis should not be confined exclusively to population policies but must simultaneously encompass holistic interventions that strengthen gender equality, social justice, and economic stability.

3.4.1. Misguided and Correct Policy Approaches

History has demonstrated that coercive or uniform population policies yield counterproductive outcomes. Approaches that compel individuals to have more or fewer children fail to offer sustainable solutions. Effective policies must fundamentally center on respecting individual reproductive autonomy and enabling individuals to achieve their desired fertility timing and family size. This, however, can only be actualized through sustained investments in education, healthcare, gender equality, and social protection frameworks (UNFPA, 2025).

3.4.2. Family-Friendly Policies and Work-Life Arrangements

Family-friendly policies, incorporating interventions such as the expansion of childcare services, flexible working arrangements, and inclusive parental leaves, constitute the core pillars of intervention (Fauser et al., 2024). Employers should be incentivized to accommodate medical appointments during processes such as in vitro fertilization (IVF) treatments and even to subsidize certain assisted reproductive

technology (ART) expenses. However, such practices are not yet widespread, and public funding emerges as an urgent necessity in this domain (Carneiro, 2024).

Although initiatives such as Sweden's granting of paid parental leave rights to grandparents or Japan's development of policies aimed at promoting marriage are commended, their impacts remain limited (Carneiro, 2024). Indeed, a study by Grimm et al. (2022) underscores that decelerations in fertility rates are frequently associated with stagnations in socioeconomic development; therefore, family-friendly policies must not be confined exclusively to care services but must be integrated with education, health, and income policies. Furthermore, within the context of gender equality, Lappegård (2020) demonstrates that work-life arrangements encouraging greater paternal participation in domestic responsibilities can support fertility rates. Consequently, the efficacy of family-friendly policies is sustained not only by technical regulations but also by the transformation of gender roles.

3.4.3. Education and Awareness-Raising Efforts

Fertility education is conceptualized as a foundational step in combating the demographic crisis. The "International Fertility Education Initiative" and the "More Joy" campaign, launched by the International Federation of Fertility Societies (IFFS), aim to raise awareness regarding the impact of age on fertility, the realistic success rates of assisted reproductive technologies (ARTs), and preventable causes of infertility (Carneiro, 2024). In this process, the effective and systematic utilization of social media channels presents a critical opportunity to reach broader demographics.

3.4.4. Equitable Access to Reproductive Healthcare Services

Inequity in access to reproductive healthcare services is conceptualized as a fundamental violation of human rights (UNFPA, 2025). Ensuring universal access to safe obstetric care, contraceptive methods, and infertility treatments carries paramount importance. The IFFS Demographic and Access to Care Review Committee emphasizes that even when treatment remains costly, equitable access yields substantial long-term benefits for both societal well-being and economic prosperity (Carneiro, 2025).

4. CONCLUSION AND RECOMMENDATIONS

The decline in global fertility rates is recognized as one of the most significant demographic challenges confronting modern societies (Fauser et al., 2024). Current empirical evidence indicates that "the Rubicon has already been crossed," underscoring the imperative for immediate action (Carneiro, 2025). Mirroring

the "elephant in the room" metaphor, this issue represents a monumental yet undeniable reality that can no longer be ignored (Carneiro, 2024).

The reduction in fertility is not merely a numerical trend but rather the manifestation of a complex interplay among gender equality, work-family reconciliation, and reproductive policies (Han & Brinton, 2022). A comparative analysis conducted by Han and Brinton (2022) on European nations demonstrates that the decline in fertility rates correlates more robustly with advancements in gender equality than with individualization and post-materialist values. Particularly in Eastern, Central, and Southern Europe, the transition from traditional gender roles toward egalitarian attitudes has generated a U-shaped fertility curve.

Concurrently, systemic fertility anxieties shape reproductive policies on a global scale, fuel anti-immigrant narratives, and exacerbate disparities in access to reproductive technologies. Indeed, depressed fertility rates intensify concerns regarding the reproductive behaviors of marginalized groups, thereby laying the groundwork for "selective pronatalism" policies (De Zordo, Marre & Smietana, 2022).

The resolution, however, is neither simplistic nor unidirectional. It demands a comprehensive framework designed to bridge the chasm between individuals' aspirations to form families and the socioeconomic, cultural, and biological impediments obstructing them. This can only be actualized through the collaborative endeavors of governments, policymakers, the business sector, medical institutions, and civil society. The ultimate objective is to construct a world where individuals can make free and informed choices, where family formation is not perceived as an economic encumbrance, where gender equality is institutionalized, and where reproductive healthcare services are universally accessible. The trajectory of the global population hinges fundamentally upon the freedom of individuals to exercise genuine choice (UNFPA, 2025). Surmounting this crisis and engineering a future anchored in sustainability, inclusivity, and equity will be attainable solely through collective will and concerted action (Aitken, 2024).

REFERENCES

Aitken R. J. (2024). What is driving the global decline of human fertility? Need for a multidisciplinary approach to the underlying mechanisms. *Frontiers in reproductive health*, *6*, 1364352. https://doi.org/10.3389/frph.2024.1364352

BM Ekonomik ve Sosyal İşler Birimi Nüfus Bölümü. (2022a). Dünya nüfus tahminleri 2022 raporu. Birleşmiş Milletler.

Birleşmiş Milletler Nüfus Fonu. (2025). The real fertility crisis: The pursuit of reproductive agency in a changing world [Web sayfası]. UNFPA. https://www.unfpa.org/swp2025

Carneiro, M. M. (2024). The battle against the global fertility crisis: have we crossed the Rubicon? *Women & Health*, *64*(7), 537–539. https://doi.org/10.1080/03630242.2024.2390757

Carneiro, M. M. (2025). The fertility crisis: looking below the tip of the iceberg. *Women & Health*, *65*(6), 475–478. https://doi.org/10.1080/03630242.2025.2521905

De Zordo, S., Marre, D., & Smietana, M. (2022). Demographic Anxieties in the Age of Fertility Decline. Medical Anthropology, 41(6-7), 591-599.

Fauser, B. C. J. M., Adamson, G. D., Boivin, J., Chambers, G. M., de Geyter, C., Dyer, S., Inhorn, M. C., Schmidt, L., Serour, G. I., Tarlatzis, B., Zegers-Hochschild, F., & Contributors and members of the IFFS Demographics and Access to Care Review Board (2024). Declining global fertility rates and the implications for family planning and family building: an IFFS consensus document based on a narrative review of the literature. *Human reproduction update*, *30*(2), 153–173. https://doi.org/10.1093/humupd/dmad028

Grimm, M., Günther, I., Harttgen, K., & Klasen, S. (2022). Slowdowns of fertility decline: When should we call it a 'fertility stall'? *Demographic Research*, *46*, 737–766. https://www.jstor.org/stable/48677041

Han, S. W., & Brinton, M. C. (2022). Theories of Postindustrial Fertility Decline: An Empirical Examination.

Lappegård, T. (2020). Future fertility trends are shaped at the intersection of gender and social stratification. *Vienna Yearbook of Population Research*, *18*, 43–48. https://www.jstor.org/stable/27041928

Soysal, G., Özcan, C., & Akın, A. (2022). *Dünyada ve Türkiye'de kadın, anne ve çocuk sağlığının güncel durumu*. **Sağlık ve Toplum, 32**(1), 3–13

Uluslararası Çocuk Merkezi & Başkent Üniversitesi Kadın-Çocuk Sağlığı ve Aile Planlaması Araştırma ve Uygulama Merkezi (UÇM & BÜKÇAM). (2021). Türkiye'de cinsel sağlık ve üreme sağlığı durum analizi [Rapor]. CİSÜ Platformu. https://cisuplatform.org.tr/cisu-rapor-tasarimi-dijital-2021/

CURRENT APPROACHES TO VAGINAL BIRTH AFTER CESAREAN SECTION: CANDIDATE SELECTION, COUNSELING, AND JOINT DECISION-MAKING

Merve İÇÖZ[66] , Döndü Sevimli GÜLER[67]

Abstract

The global rise in cesarean birth has chosen mode of birth in a subsequent pregnancy a major clinical and public health priority. In line with global trends, Turkey's cesarean section rate of 61.5% is more than double the OECD average. This situation makes the cumulative risks of repeated cesarean sections a national public health problem, and prioritizes vaginal birth after cesarean section (VBAC) as a strategic option within the framework of 'Mother-Friendly Hospital' criteria. Vaginal birth after cesarean (VBAC) is an important option that can reduce unnecessary repeat cesareans, support faster maternal recovery, and limit the cumulative risks associated with multiple surgeries. Current evidence indicates that VBAC success rates are commonly between 60% and 80%, with the highest probability among women with a prior vaginal birth, a nonrecurrent indication for the previous cesarean, spontaneous labor onset, favorable body mass index, and adequate interpregnancy interval (ACOG, 2019; Barnea et al., 2025). However, candidate selection should not rely on obstetric history alone; uterine incision type, previous uterine rupture, coexisting contraindications to vaginal birth, and institutional readiness for emergency cesarean delivery must be assessed together (Deshmukh et al., 2024; Queensland Clinical Guidelines, 2025). Recent studies suggest that prediction tools may support counseling, yet decisions should not be based solely on numerical estimates (Gimovsky et al., 2026; Jemison et al., 2025; Pegu et al., 2025). Women's preferences regarding VBAC are also shaped by prior birth experiences, fear, social support, and the attitudes of professionals, underscoring the need for unbiased counseling and shared decision-making (Cosmai et al., 2025; Williams et al., 2022). This review synthesizes current evidence on VBAC, focusing on candidate selection, risk stratification, intrapartum management, counseling, and implications for midwifery practice.

Keywords: vaginal birth after cesarean, trial of labor after cesarean, candidate selection, counseling, shared decision-making, midwifery

Clinical Framework

The approach to SSVD is not limited to the question of "is it appropriate or not?"; the candidate's clinical suitability, the institution's preparedness, and the woman's values must be considered together. The

[66] (Midwife, Msc, Phd Candidate) Sakarya University, Institute of Health Sciences, Department of Midwifery, Sakarya, Türkiye, ORCID ID: 0009-0002-6636-9014 e-mail:merve.icoz@ogr.sakarya.edu.tr

[67] (Midwife, PhD, RM) Department of Nursing, Faculty of Health Sciences, Sakarya University of Applied Sciences, Sakarya, Türkiye, ORCID ID: 0000-0003-2618-4920 e-mail: donduguler@subu.edu.tr

following summary illustrates the main clinical framework of the review.

RELIGION	CLINICAL CONTENT	MIDWIFERY CARE AND CONSULTATION
Reasons supporting the nomination	Previous low transverse incision, previous vaginal delivery, indication for no recurrence, spontaneous onset of labor.	Continuous Support and Decision Coaching
Situations requiring attention/re-evaluation	Obesity, advanced maternal age, need for induction, suspicion of macrosomia, history of two previous cesarean sections	Value-Oriented Consultancy
Contraindication or requirement for an advanced center	Previous classic incision, history of uterine rupture, major placenta previa, lack of immediate infrastructure.	Psychological Support and Informed Consent

Introduction

The increase in cesarean section rates worldwide has re-centralized the debate on the next mode of delivery in pregnant women with a history of previous cesarean section. While repeated cesarean sections are life-saving in some cases, each additional surgical delivery increases the cumulative risks such as adhesion, placenta accreta spectrum, surgical complications, and healing burden. For this reason, the current literature considers not only safe primary cesarean section but also supporting vaginal delivery after safe cesarean section in eligible women as one of the main ways to balance cesarean section rates (Barnea et al., 2025; Lazzaro et al., 2025).

In line with the worldwide trend, Türkiye has a cesarean section rate of **61.5%**, more than doubling the average of Organization for Economic Co-operation and Development (OECD) countries (T.C. Ministry of Health, 2025). These high rates have made the risks of placenta accreta spectrum and cumulative surgical complications brought on by repeated cesarean sections a national public health priority (Barnea et al., 2025). T.C. In order to balance these data, the Ministry of Health prioritizes policies that encourage vaginal delivery after cesarean section (SSVD) in eligible pregnant women and mandate evidence-based information within the scope of the 'Mother Friendly Hospital' criteria. These local strategies position SSVD not just as an individual choice but as an institutional quality indicator for safeguarding maternal health (T.C. Ministry of Health, 2023)

Terminologically, "trial of labor after cesarean" (TOLAC) refers to a planned attempt at labor after a previous cesarean section; "vaginal birth after cesarean" (VBAC/SSVD) refers to the part of this that results in a successful vaginal birth. This distinction is clinically important; because candidate selection and consultancy are made around the TOLAC decision, while success and result discussions are evaluated

when VBAC takes place (ACOG, 2019; Deshmukh et al., 2024).

FIGO's 2025 good practice recommendations suggest that SSVD is a safe and effective option in appropriately selected women; reports that success rates range from 60–80% in most series, with the risk of uterine rupture remaining approximately 0.3–0.7% in women with previous low transverse incisions (Barnea et al., 2025). Therefore, the contemporary approach requires presenting SSVD not as an exceptional practice, but as one of the standard counseling options for correctly selected cases.

Candidate selection: Who can be considered eligible for SSVD?

The most suitable candidate profile in the current approach: singleton, with cephalic presentation, mostly in term pregnancy; have had a previous low transverse caesarean section; is a woman who has no independent contraindications to vaginal delivery and where the delivery is planned in a center where emergency cesarean section can be quickly switched (ACOG, 2019; Queensland Clinical Guidelines, 2025). This framework is not based on the presence of scars alone, but on the type of uterine scar and the response capacity of the center where the delivery will be performed.

In contrast, conditions that exclude vaginal delivery on their own, such as classical or upper segment uterine incision, previous uterine rupture, and placenta previa, are considered the main contraindications for SSVD. Deshmukh et al. (2024) emphasize that the risk of uterine rupture is markedly increased in the previous classical history of incisions and ruptures, and these cases should be addressed in the direction of planned repeat cesarean sections. Similarly, the Queensland Clinical Guidelines (2025) and other contemporary guidelines recommend reviewing the C-section surgery note if the previous incision type is unknown, and making a more cautious decision if there is a high suspicion of a classical incision.

The issue of TOLAC after two previous C-sections requires a more selective approach FIGO 2025 good practice recommendations report that SSVD success rates in women with a history of two previous C-sections are remarkably similar to those after a single C-section. However, it is emphasized that the risk of uterine rupture is slightly higher in this group (around 1.3–1.5%) and that the decision should be made with a detailed risk-benefit discussion considering this risk increase, rather than a categorical exclusion. (Barnea et al., 2025). A recent clinical review published in Midwifery Women's Health also argues that in two previous cesarean section histories, the decision should be made through detailed risk-benefit conversation rather than categorical exclusion (Forte, 2025).

Variables affecting the probability of success and risk prediction

SSVD success is not constant; Clinical history, current pregnancy characteristics and action dynamics together determine the outcome. The FIGO 2025 guide lists previous vaginal delivery or previous successful SSVD, indication for a previous cesarean section without recurrence, spontaneous onset of labor, body mass index below 30 kg/m², and a birth interval of at least 18 months as the main variables that increase success (Barnea et al., 2025). These factors are not only statistical markers, but also clinical

indicators that can be explained to the woman during counseling.

Predictive models have become more refined in recent years. The DEVI-CS model developed by Pegu et al. (2025) aims to quantitatively predict the likelihood of successful TOLAC with easily obtainable variables such as maternal age, indication for previous cesarean section, Bishop score, and induction requirement. A new machine learning-based calculator published in 2026 expands the scope of counseling by presenting not only the probability of success but also the probabilities of uterine rupture and maternal/neonatal morbidity (Gimovsky et al., 2026).

However, the most significant limitation of modern calculators is the risk of mechanizing the clinical decision. Numerical estimates should be interpreted together with the woman's values, previous birth experiences, perception of pain and safety, plan for having children in the future, and the real possibilities of the institution. Current evidence therefore supports the use of calculators as tools that "structure speech" rather than "make decisions" (Gimovsky et al., 2026; Jemison et al., 2025).

Uterine rupture, induction and action management

Uterine rupture is often at the heart of SSVD discussions. Although UTERINE rupture is rare, it is the main safety axis of candidate selection and action management, as it can have serious maternal and perinatal consequences when it occurs. The expert review published in AJOG highlights that while the absolute risk is low, the type of previous uterine surgery, the need for induction/augmentation, and the clinical course of action can alter the risk (Deshmukh et al., 2024).

Spontaneous action is associated with higher success overall and lower need for intervention. However, careful protocols are required in cases where induction or augmentation is required. A 2026 systematic review and meta-analysis found that oxytocin use during TOLAC was associated with an increased likelihood of uterine rupture; in particular, shorter dose escalation intervals and higher total oxytocin exposure may increase the risk (Nicolì et al., 2026). Therefore, experienced team, open protocol and close fetal-maternal follow-up are mandatory in cases requiring induction.

Contemporary guidelines agree on continuous fetal heart rate monitoring during the act, careful assessment of uterine activity and maternal symptoms, and maintaining institutional readiness for emergency cesarean section. Deshmukh et al. (2024) note that avoiding prostaglandin use and careful titration of oxytocin are important for safety. In practice, this shows that the "SSVD is possible" approach can only become ethical and safe with infrastructure that can be "intervened quickly if necessary".

Consulting and shared decision-making: from numerical risk to relational care

The key element shaping the choice of SSVD is the complex interplay of psychosocial factors as well as physical requirements. The quality of perinatal counseling and the perceived risks directly impact the mother's decision-making. For women who found a previous birth traumatic, a vaginal birth is an opportunity to remanage the process and heal. In contrast, mothers who have not had traumatic experiences or are concerned about the uncertainty of

childbirth may find a planned caesarean section to be a 'safe haven'. At this point, the support offered by healthcare professionals is the most critical threshold that determines the quality of choice (Cosmai et al., 2025)

Counseling on SSVD is not a one-time consultation about the mode of delivery; It is a process that continues throughout pregnancy, clarifies preferences and helps the woman cope with uncertainty. A 2025 systematic review showed that the main facilitators influencing women's decision to undergo VBAC were desire for vaginal delivery, shorter expectation of recovery, previous positive experiences, partner and social support, respectful communication, and reassuring professional attitude. In contrast, fear, pain anxiety, adverse previous birth experiences, exaggerated presentation of risk, and directive/cooperative counseling are among the major barriers (Cosmai et al., 2025).

Qualitative research shows that consultancy satisfaction is affected not only by the content but also by the quality of communication. The study in Latina women reported that jargon-free explanations, reassuring attitude, taking experiences seriously, and feeling like the woman could make her own decision increased counseling satisfaction (Williams et al., 2022). This finding suggests that shared decision-making is not only an ethical principle but also a method that increases the clinical effectiveness of counseling.

In the shared decision-making approach, repeat cesarean section and TOLAC options should be presented at the same time, in a balanced and comparative manner. It is not enough to just ask the woman "what percentage of your chance of success"; the possibility of unsuccessful TOLAC, possible emergency cesarean section requirement, next pregnancy plans, reasons for not wanting surgery, fear of childbirth and the facilities of the institution should be discussed together. Thequality improvement project by J emison et al. (2025) found that the use of a standardized VBAC calculator facilitates more systematic and timely discussion of delivery mode options in the clinical process (Jemison et al., 2025). However, the contemporary midwifery approach emphasizes that the decision should not be made based solely on an algorithm based on numerical probabilities. At this point, the use of interactive tools such as 'visual decision trees' or 'video information kits' that center on women's personal values and preferences plays a critical role in reducing decisional conflict, managing fear, and strengthening women's autonomy. Such materials make complex risk data more understandable, transforming the counseling process from a 'risk-focused information' to a 'holistic birth planning' that encompasses the woman's life context and values (Cosmai et al., 2025; Williams et al., 2022; Forte, 2025).

Midwifery perspective: fear management, continuity and women-centred care

The midwifery perspective in the SSVD debate is not just about "supportive communication"; It together includes the functions of evidence-based candidate assessment, risk communication, supporting physiological childbirth and maintaining the woman's autonomy. The ACNM's current position emphasizes the right of pregnant women with a history of previous cesarean section to have safe and accessible delivery options; it recommends that care be carried out within an integrated system and with access to emergency services (American College of Nurse-Midwives [ACNM], 2025).

Midwives play a key role in fear management. Fear of childbirth, anxiety about failure, or traumatic

memories of a previous C-section can make a repeat C-section feel safer for many women. In contrast, uninterrupted information delivery, repeated interviews during the antenatal period, space for recounting previous birth experience, and realistic but hopeful framing can reduce decision conflict. Cosmai et al. (2025) and Forte (2025) emphasize that continuous midwifery care and decision assistance tools strengthen women's sense of control and autonomy.

In addition, the social context of CSVD should be made visible as well as the physiological dimension in midwifery care. The woman's burden of care at home, the expectation of recovery, the impact of previous surgical experience on family life, and future fertility plans are integral parts of the decision-making process. For this reason, the current midwifery approach shifts from "risk-telling counseling" to "birth planning in the context of life".

Reflections on health care delivery and policy level

It is known that SSVD rates are not only determined by patient preference, but are also strongly influenced by corporate policies and professional culture. In many centers, provider hesitation, legal concerns, 24-hour operating room access issues, and non-standard counseling processes can limit eligible women's access to the TOLAC option (Forte, 2025; Jemison et al., 2025). Thus, increasing SSVD should be seen as a quality issue that concerns the institutional organization rather than the effort of individual clinicians.

Steps required at the policy level are: standardizing candidate assessment in early pregnancy, systematically recording delivery mode options, using risk calculators as explanatory tools, clarifying intrapartum emergency response protocols, and disseminating care models that support women's active participation in the decision-making process. Thus, the aim is not to direct every woman to SSVD; to ensure that suitable candidates can make informed and real choices.

Conclusion

Vaginal delivery after cesarean section is not a marginal option of current obstetric care, but rather an evidence-based mode of delivery alternative that may reduce repeat surgery in eligible women. FIGO 2025 recommendations and studies in recent years show that success rates are significant; however, it shows that success is closely related to careful candidate selection, institutional preparation, action management, and qualified consultancy (Barnea et al., 2025; Deshmukh et al., 2024).

Therefore, the contemporary approach should consider CSVD candidacy not only as an obstetric algorithm, but also as a shared decision-making process in which clinical risks and women's values are weighed together. The midwifery perspective is decisive at this point; because fear management, continuity of care, support of physiological childbirth and strengthening of autonomous decision are integral parts of safe SSVD care. As a result, the goal is not to categorically reduce cesarean sections; to establish systems that can offer every woman a safe, respectful and evidence-based birth option.

REFERENCES

American College of Nurse-Midwives. (2025). Care of the pregnant person with a history of cesarean birth. https://midwife.org/wp-content/uploads/2025/02/2024-Care-of-the-Pregnant-Person-with-a-History-of-Cesarean-Birth.pdf

American College of Obstetricians and Gynecologists. (2019). Vaginal birth after cesarean delivery. Obstetrics & Gynecology, 133(2), e110–e127. https://doi.org/10.1097/AOG.0000000000003078

Barnea, E. R., Ramašauskaitė, D., Ubom, A. E. B., Theron, G., Dall'Asta, A., Impey, L., Jangö, H., Eke, A. C., Neji, K., & contributors. (2025). FIGO good practice recommendations for vaginal birth after cesarean section. International Journal of Gynecology & Obstetrics, 171(1), 17–31. https://doi.org/10.1002/ijgo.70406

Cosmai, G., Biondini, M., Panzeri, M., Serafini, M., Lambicchi, L., Locatelli, A., Nespoli, A., & Fumagalli, S. (2025). The decision-making process in the choice of VBAC: Facilitators and barriers from women's perception, a systematic review. European Journal of Midwifery, 9, Article 205874. https://doi.org/10.18332/ejm/205874

Deshmukh, U., Denoble, A. E., & Son, M. (2024). Trial of labor after cesarean, vaginal birth after cesarean, and the risk of uterine rupture: An expert review. American Journal of Obstetrics & Gynecology, 230(3S), S783–S803. https://doi.org/10.1016/j.ajog.2022.10.030

Forte, B. (2025). Supporting labor after 2 cesarean births. Journal of Midwifery & Women's Health, 70(1), 144–149. https://doi.org/10.1111/jmwh.70006

Gimovsky, A. C., Monje, S., Dunn, J., & Levine, J. (2026). A novel and modern calculator to predict vaginal birth after cesarean delivery. American Journal of Perinatology, 43(3), 300–306. https://doi.org/10.1055/a-2605-7786

Jemison, J., Brown, T., & Pile, N. (2025). Improving standardization of care using the Maternal-Fetal Medicine Units Network vaginal birth after cesarean calculation tool. Nursing for Women's Health, 29(5), 293–300. https://doi.org/10.1016/j.nwh.2025.04.004

Lazzaro, A., Omu, A. E., Ezechi, O. C., Brubaker, S. G., Farage, M., Kovavisarach, E., Nassar, A. H., Perez, E. B., Senanayake, H., Ubom, A. E. B., & Di Renzo, G. C. (2025). Reducing post-cesarean sepsis: Current best practice in prevention and treatment. International Journal of Gynecology & Obstetrics, 171(1), 32–54. https://doi.org/10.1002/ijgo.70396

Nicolì, P., De Luca, R., Ghi, T., Frusca, T., Fabbri, E., & Dall'Asta, A. (2026). Oxytocin dosing during trial of labor after cesarean to minimize the risk of uterine rupture: A systematic review and meta-analysis. American Journal of Obstetrics & Gynecology MFM, 8(1), 101846.

https://doi.org/10.1016/j.ajogmf.2025.101846

Pegu, B., Subburaj, S. P., Chaturvedula, L., Sarkar, S., Nair, N. S., & Keepanasseril, A. (2025). Development and internal validation of a model predicting successful trial of labour among pregnant individuals with a previous caesarean section: A cohort study (DEVI-CS model). European Journal of Obstetrics & Gynecology and Reproductive Biology, 305, 210–217. https://doi.org/10.1016/j.ejogrb.2024.12.029

T.R. Ministry of Health. (2025). *Health Statistics Yearbook 2024.* Ankara: T.C. Ministry of Health Publications.

T.R. Ministry of Health, General Directorate of Public Health. (2023). *Mother-Friendly Hospital Program Implementation Guide*. Ankara: T.C. Ministry of Health Publications

Queensland Clinical Guidelines. (2025). Vaginal birth after caesarean (VBAC). Queensland Health. https://www.health.qld.gov.au/__data/assets/pdf_file/0022/140836/g-vbac.pdf

Williams, A. C., Martinez, L. I., Garrison, A., Frost, C. J., & Gren, L. H. (2022). Factors leading to satisfaction with counseling for labor after cesarean among Latina women in the United States. Birth, 49(1), 71–79. https://doi.org/10.1111/birt.12575

InTraders Academic Platform

"We caress the souls of researchers."
InTraders Academic Platform

https://www.intraders.org

Autumn Conferences

https://www.intraders.org/october/

Spring Conferences

https://www.intraders.org/may/

Academic Journal (2018)

https://dergipark.org.tr/en/pub/intraders

Conference Alerts

https://www.conferencealertsintraders.com



The 15th InTraders International Conference On Multidisciplinary Studies, 18-19 May 2026, Bucharest, Romania

https://www.intraders.org

e-ISBN: 978-625-92035-6-0

https://doi.org/10.66793/intraders15proceeding