KAMIL GACEK

PHD CANDIDATE IN ECONOMICS AND FINANCE

CONTACT

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ABOUT ME

My research bridges environmental economics and advanced mathematical modeling to assess the macroeconomic impacts of droughts on the Polish economy. By applying Input-Output frameworks, I examine both direct and indirect sectoral water dependencies to understand how shortages trigger cascading economic shocks. This involves employing Structural Decomposition Analysis across the 2010-2020 period to trace the drivers behind changing water consumption, such as technological shifts and variations in final demand. Moreover, I analyze forward and backward linkages to map out critical industries with the highest water footprint within the economic structure. To measure specific vulnerabilities, my work leverages Dynamic Inoperability Input-Output Models (DIIM) to estimate cumulative economic losses caused by disruptions in water availability. Ultimately, my research aims to develop an interactive economic model, providing stakeholders with a practical tool to simulate disruptions and test the effectiveness of different risk management strategies.

ACADEMIC EXPERIENCE

10/2025-present

AGH UNIVERSITY OF KRAKOW

Role: Research and Teaching Assistant *(part-time)*

Department: Department of Applications of Mathematics in Economics, Faculty of Management

- Taught Courses:
  - Algebra and Differential Calculus,
  - Mathematics in Management,
  - Spectral Analysis in Economics and Finance.
- Key Responsibilities:
  - Preparing quizzes and exams,
  - Holding office hours,
  - Participating in Discipline Council meetings.

11/2024-10/2026

INSTITUTE OF PHILOSOPHY AND SOCIOLOGY OF POLISH ACADEMY OF SCIENCES

Role: Research Assistant in POLPAN Project

- Conducted statistical analyses and data modeling using the longitudinal POLPAN dataset,
- Harmonized the 1988-2018 database with data scientists, ensuring high data integrity and variable consistency.,
- Co-authored bilingual documentation (PL/EN) for multiple study waves, including the 2023 edition,
- Supported the management of the POLPAN Lab, including team meetings, seminars, and academic publications,
- Contributed to high-quality academic publications, books and public research reports.

PROFESSIONAL EXPERIENCE

08/2025-present	JACOBS	**HR Data Analyst Partner**
04/2025-07/2025	APTIV	**People Analytics Lead Analyst**
06/2022-03/2025	APTIV	**HR Data Analyst**
06/2021-05/2022	APTIV	**Intern in People Analytics Team**

EDUCATION

MBA (2024 - 2025) - WSB University, Krakow, Poland

PhD in Economics and Finance (2023 - present) - AGH University, Krakow
Thesis: *Input-Output Models in Disaster Impact Assessment*

Master's in Applied Mathematics (2020 - 2022) - Jagiellonian University, Krakow
Thesis: *Numerical range and Crouzeix conjecture*

Bachelor's in Finance, Banking, and Insurance (2019 - 2022) - Jagiellonian University, Krakow
Thesis: *Trade wars. The course and consequences based on the example of the USA-China conflict*

Bachelor's in Mathematics (2017 - 2020) - Jagiellonian University, Krakow
Thesis: *Minimal surfaces in R^3*

PUBLICATIONS

- Gacek, K., & Santos, J. R. (2026). **Quantifying drought-induced systemic risk in the Polish economy through an integrated Nature Value-at-Risk and Dynamic Inoperability Input-Output approach**. *Risk Analysis* (IF 3.3). (Under Review).
- Gacek, K. (2026). **Who pulls, who pushes? Mapping Poland's 2020 water footprint and key sectors via input-output backward/forward linkages**. *Water Resources & Industry* (IF 7.5). https://doi.org/10.1016/j.wri.2026.100368,
- Gacek, K. (2025). **Industrial Waste in Poland (2010–2020): A Sectoral View Using Input-Output Models and Structural Decomposition Analysis**. *Acta Universitatis Lodziensis. Folia Oeconomica,* 1–24. https://doi.org/10.18778/0208-6018.371.01;
- Gacek, K. (2025). **Sectoral interdependencies and waste generation in Poland (2010–2018): insights from Input-Output analysis.** *Economics and Environment*, 92(1), 798. (IF 1.0). https://doi.org/10.34659/eis.2025.92.1.798;
- Gacek, K. (2024). **Tracing the drivers of waste generation in Poland (2010–2018): a structural decomposition and input–output approach**. *Bulletin of Geography. Socio-Economic Series*, (63), 75–85 (IF 0.8). https://doi.org/10.12775/bgss-2024-0006;

RESEARCH VISIT

- **George Washington University, Washington, D.C., USA (Feb 23-27, 2026)**

Research consultations on Input-Output modeling with Prof. Joost Santos (GWU) and discussions with World Bank economists.

WORKSHOPS

- **16th Input Output Workshop (2025), Netherlands**

Oral presentation: *Building Resilient Economies: The Role of Inoperability Input-Output Modeling in Natural Hazard Mitigation*.

CONFERENCES

- **16th International Conference on New Ideas in Management, Economics and Accounting (2026), Helsinki**

Oral presentation: *Decomposing Water Demand Dynamics: A Structural Decomposition Analysis of the Polish Economy (2010-2020)*

- **10th International Conference on Advanced Research in Management, Business and Finance (2026), Athens**

Oral presentation: *Mapping Water Dependencies via IO Linkages: Identifying Key Sectors in Poland's Economy (EEIO 2020)*

- **9th International Conference on Business, Management and Finance (2025), Cambridge**

Oral presentation: *Seeing the Invisible Water: Direct vs. Indirect Use in Poland's Economy (EEIO 2020)*

- **4th National Conference of Young Scientists (2025), Online**

Oral presentation: *Drought in Europe in the Era of Global Warming: Conclusions from the PESETA IV Report*

- **International Conference on Economics, Finance & Business (2025), London**

Oral presentation: *Intersectoral Linkages and water use: identifying and tracking key sectors in Poland (2015-2020).*

- **EKO DOK Conference (2023), Poland**

Oral presentation**:** *Decomposition Analysis and Input Output Models: A Framework for Environmental Assessments in Poland*

SUMMER SCHOOLS

- Summer School "*The New Global Economic Order*" (2026), Italy
- Summer School "*HydRoData: Summer school about Hydrology and Data*" (2025), Slovenia
- Summer School "*The World Economy's Shifting Winds: New Challenges, Threats, and Opportunities*" (2024), Italy
- Summer School for Young Economists from the Three Seas Region (2023), Poland

GRANTS AND FUNDINGS

- Two University Mini-Grants for Research Projects Conducted by PhD Students
  - **Role: Principal Investigator (2026-2027)**
    - Project Title: Endogenization of Households in an Environmentally Extended Input-Output Model: An Analysis of Induced Effects in the Water Footprint of the Polish Economy
  - **Role: Principal Investigator (2024-2025)**
    - Project Title: Analysis of the direct, indirect, and induced economic impacts of drought in Poland using Input-Output models
- Financing the purchase of Computer Sets for the Best Doctoral Students, 2025

AWARDS AND DISTINCTIONS

- Two Scholarships for the Best PhD Students, 2025/2026
- Two Scholarships for the Best PhD Students, 2024/2025
- **TopMinds 2025 Program Participant** – chosen for the mentorship program organized by the **Polish-American Fulbright Commission** and **Top500 Innovators**.

ORGANIZATIONS

- National Doctoral Council, Projects Team (Mar.25 - present)
- The Polish Economic Society (Dec.24 - present)
- Discipline Council for Economics and Finance at AGH (Oct.24 - present)
- International Input-Output Association (Dec.23 - present)