Mohamed Hsin Bennour

PhD Candidate in Regional Development · University of Pécs, Hungary
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Summary

PhD candidate in Regional Development at the University of Pécs - Faculty of Business and Economics. I study how European regions diversify into new technologies, combining machine learning, network analysis and spatial econometrics to predict which technologies a region can realistically enter, and why. Published in *Journal of Physics: Complexity* (2026) and *Society and Economy* (2025).

Education

PhD Candidate, Regional Development 2022 – present
Doctoral School of Regional Policy and Economics, Faculty of Business and Economics, University of Pécs

Dissertation: *Contextualising Regional Technological Diversification in European Regions: Network Structure, Industrial Alignment, Entrepreneurial Ecosystems, and Spatial Interdependence.*

Reframes technological relatedness as a prediction problem: machine learning models trained on European patent data estimate each region's technological potential for every technology and yield a directed technology network. Using these, the thesis distinguishes bridging and enabling technologies and tests how network position, industrial alignment, national entrepreneurial ecosystems and spatial dependence shape which diversification options are feasible. ETA for final defense: Feb 2027

MSc in Business Analytics Dec 2020
Tunis Business School
Efficiency analysis and modelling, computational statistics.

BSc in Econometrics Jul 2018
ISG Sousse
Probability and statistics, econometrics and operations research.

Publications

Regional potential and friction for technological diversification: a machine learning frontier approach Jan 2026
Journal of Physics: Complexity, 7(1), 015005. Open access.
doi.org/10.1088/2632-072X/ae35bc

Efficiency of Eastern European schools and the role of their context 2025
Society and Economy, 47(3), 318–337.
doi.org/10.1556/204.2025.00005

Conference presentations

How European regions optimise their complexity through technological diversification Sep 2026
EconNet Workshop, Faculty of Business and Economics, University of Pécs

Foreign Direct Investment and the Limits of Regional Upgrading: Evidence from GVC Roles in Central and Eastern Europe Aug 2026
ERSA 2026 Congress, Sofia, Bulgaria
With Zoltán Gál.

Contextualising Regional Technological Diversification in European Regions: Network Structure, Industrial Alignment, Entrepreneurial Ecosystems, and Spatial Interdependence May 2026
MKE Doctoral Workshop, Faculty of Business and Economics, University of Pécs

Regional potential and friction for technological diversification Jan 2026
8th Geography of Innovation Conference, Corvinus University of Budapest, Hungary

Predicting regional patents diversification and their triggers: an explainable machine learning approach Aug 2025
64th ERSA Congress, Athens, Greece

Structural Challenges and GVC Positions in FDI Dependent Economies: Insights from the V4 Regions Jun 2025
XVII Finance Days in Pécs, Finance and Accounting International Scientific Conference, Pécs, Hungary
With Zoltán Gál.

Adoption of digital web technology, inequality and the role of space May 2024
RKK40 Anniversary Conference, HUN-REN Institute for Regional Studies, Pécs, Hungary
With Stefan Apostol and András Gyimesi.

How Hungarian Universities and Research Institutions Can Expand Their Scientific Expertise? Apr 2024
MKE Doctoral Workshop, Faculty of Business and Economics, University of Pécs

Visegrad Countries and Education Challenges: An Efficiency Analysis Mar 2024
Globalisation, Integration, Cooperation Conference, University of Szeged, Hungary

Funding

Stipendium Hungaricum Scholarship 2022 – present
Tempus Public Foundation, Hungary
Scholarship for doctoral studies at the University of Pécs.

Teaching

Seminar Instructor, Quantitative Methods (BA) Sep 2026 – present
Faculty of Business and Economics, University of Pécs
Teaching the seminars of the introductory course in algebra and calculus.

Teaching Assistant Jan – Jul 2020
Tunis Business School
Tutored the introductory course in descriptive statistics and probability.

Applied and policy experience

Data Analyst Consultant, Severity Assessment Oct 2024 – Jun 2025
Internal Displacement Monitoring Centre (IDMC), Geneva, Switzerland
Built a config-driven targets pipeline for REACH and IOM needs-assessment data from 15 countries: survey-weighted estimates, group tests and disaggregations, with small cells suppressed automatically, merged into a 2022–2024 severity dataset.
R · targets · srvyr

Consultant Aug – Dec 2023
The Graph Network, Geneva, Switzerland
Designed and recorded data science courses.
R

Consultant Sep 2022 – Jan 2023
Geomatys, Montpellier, France
Refactored and redesigned R code bases, optimising running time and memory use.
R · data.table

Data Officer Apr – Sep 2022
REACH Initiative, Tunis, Tunisia
Designed data pipelines and monitoring dashboards for several teams, and coordinated inputs on data collection.
R · Python · PostgreSQL · Azure

Database Specialist Jan 2021 – Jan 2022
National Pen, Tunis, Tunisia
Automated key processes, and cleaned and managed company data.
SQL Server · MS Access

Data Analyst Mar – Aug 2020
EMRHOD Consulting, Tunis, Tunisia
Developed client proposals, and designed and ran quantitative and qualitative studies, including focus groups.
SPSS · R · Python · Power BI

Operations Intern Jun – Aug 2019
N3XT Tunisie, Tunis, Tunisia
Implemented SAP S/4HANA operations modules to match clients' business needs.

Methods and Software

Statistical modelling and machine learning
Random forest classification with rolling train–test designs; fixed-effects and multilevel panel models; spatial econometrics (spatial lag and spatial error panel models); network analysis.
tidymodels · ranger · fixest · lme4 · pspatreg · spdep · igraph

Survey analysis
Design-based estimation under complex sampling (stratification, clustering, weights), group comparisons and multi-level disaggregation of needs-assessment data.
survey · srvyr

Data processing
Processing and linkage of large patent, administrative and survey datasets, including European patent records (REGPAT) for 30 countries at NUTS 2 level.
data.table · tidyverse · arrow · sf

Reproducible research workflows
Modular, documented analysis pipelines with dependency tracking and parallel execution: six linked pipelines for the doctoral research and a multi-country survey-analysis pipeline for IDMC.
targets · tarchetypes · crew · purrr · Git

Visualisation and reporting
Publication-quality figures, maps and regression tables produced within the analysis pipeline.
ggplot2 · ggraph · gt · modelsummary · Quarto

Programming languages
R (primary), Python, SQL (PostgreSQL, SQL Server), LaTeX, Typst.

Community

Team Lead, Analysis 2019 – 2020
Data-colab

Co-founder and Board Member 2018 – 2020
TBS Data Science Club, Tunis Business School