



# UNIVERSITÀ POLITECNICA DELLE MARCHE

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**Technological trajectories in STEP  
and NetZero sectors.  
Industry and corporate analysis  
using web-mining and patent data**

**Supervisor: Prof. Marco Cucculelli**

Department of Economics and Sociali Sciences  
- <https://dises.univpm.it/en/home-english/>



## Supervisor: Prof. Marco Cucculelli

### Research group description

- ▶ **Prof. Marco Cucculelli**, PhD, Professor in Applied Economics (<https://orcid.org/0000-0003-0035-9454>, Scopus: 56 papers, 1627 citations, h-index 20)
- ▶ Coordinator of the PhD in Economics at Università Politecnica delle Marche, Secretary General of the Italian Economic Association and Fulbright Chair at the University of Pittsburgh (USA).
- ▶ Marco Cucculelli works in the fields of innovation, corporate finance & governance, entrepreneurship. He is an Associate Editor in several international journals (JSBM Associate Editor of the Year in 2014) and chaired several ICSB World Conferences. He is the coordinator of the Annual Conference of the Italian Economic Association. He is in the Top 2% Scientists ranking by Stanford University - Elsevier.
- ▶ He participated as principal investigator to EU-funded projects and worked for the Italian Ministry of University. He is a founding member of the Industry Studies Association (USA) and a founding member of the Asian Entrepreneurship Association. He was Director at-large at the International Council for Small Business and Entrepreneurship, Washington, D.C. (USA).



#### - Most recent/relevant publications:

- Linying Li; Raza, M.Yousaf; Cucculelli, Marco (2024). Electricity generation and CO2 emissions in China using index decomposition and decoupling approach, Energy Strategy Reviews, Volume 51
- Raza, M.Y., Cucculelli, M. Sustainable energy changeover in Pakistan: prospects, progress, and policies, (2024). Environmental Science and Pollution Research 31
- Bahoo S. Cucculelli M. (2023). Artificial intelligence and corporate innovation. A review and research agenda. Technological Forecasting & Social Science, Volume 188
- Lena D. Pasurka C. Cucculelli M. (2022), Environmental regulation and green productivity growth. Evidence from Italian manufacturing firms. Technological Forecasting & Social Science, 4
- Cucculelli M. Peruzzi V. (2020). Innovation over the industry life cycle. Does ownership matter? Research Policy, Volume 49, Issue 1



### Recent European fundings:

- **TaskforCome** – Interreg Central Europe - To improve skills and entrepreneurial competences for advancing economic and social innovation in Central European regions – 2019-2022
- **AdriHealthMob** – Health and mobility in the Adriatic microregion (2016)

### National fundings:

- **Firms within networks of words: Using text data to measure proximity between firms and firm performance**, 2023-2025
- **IT-compatible business models for technology transfer**, 2018-2021
- **Competences for SMEs' growth in innovative and eco-sustainable sectors. Gaps and policy options**, 2018-2022

- The research group consists of senior researchers, post-docs and PhD students from the Department of Social Sciences and Economics at Università Politecnica delle Marche and a group of researchers from partner universities: University of Brussels (innovation and technology analysis), Shandong Technology and Business University (energy and environment), ZEW Mannheim (technology management), University of Bologna (patent analysis) and Perugia (innovation).
- The participating researchers have different and complementary skills and abilities, as well as specific expertise in the use of data management tools for empirical analysis.
- All researchers are outstanding scientists with specific expertise in the fields of patents, innovation, energy and environmental economics and policy, technology foresight and industrial scenarios.
- In addition, there are research links with private national research centers (Istituto Tagliacarne - Italian Association of Chambers of Commerce) and with research departments of national and international organizations (Confindustria and OECD).
- The research group has access to several public databases on company accounts and patents, as well as proprietary datasets on surveys and field studies conducted by members of the Department.



# The Department of Economics and Social Sciences

Director: Prof. Maria Cristina Recchioni

The Department of Economics and Social Sciences (DiSES) was established on 1 July 2011 from the merger of the Department of Economics with the Historical and Sociological area of the Department of Social Sciences, and the Applied Economics area of the Department of Management and Industrial Organization.

45 professors and researchers are affiliated with the Department: 27 belong to the economics area, 8 to economic statistics, 6 to the social sciences area, and 4 to economic history. The technical and administrative staff is made up of 10 people: the administrative secretary, 5 administrative and 4 technicians.

The main research areas developed concern: Growth and Economic Development, Demography, Econometrics, International Economics and Trade, Environmental Economics, Labor Economics, Industrial, Business and Innovation Economics, Monetary Economics, Public Economics, Regional Economics, Macroeconomics, Economic Sociology, Social and Health Organizations, Economic Statistics, History of Economic Thought, and Economic History.

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## AT A GLANCE

**DISES**



45 professors  
and  
researchers

Bachelor Degree in:

- Digital Economics and Business
- Economics and Business

Master Degree in:

- Economic and Financial Sciences
- Data Science for Business Management
- International Economics and Commerce



Ph.D. in Economics



Research center: CRIS  
Research group: MoFiR

**Board Members and Associate Editors**

- European Journal of Operational Research
- Journal of Economic Behavior & Organization
- Journal of Economic Interaction and Coordination
- Journal of Small Business Management
- Small Business Economics
- Italian Economic Journal

**Public Engagement:**

- Paolo Canofari: Independent expert for the Economic and Monetary Affairs Committee of the European Parliament;
- Francesco Maria Chelli: ISTAT pro tempore President;
- Marco Cucculelli: General Secretary of the Italian Economic Association; Top 2% Most Influential Scientists (Ranking Stanford)
- Riccardo Lucchetti: Member of the GRETL developer team



⇒ **Project Idea: Technological trajectories in STEP and NetZero sectors.**

**Industry and corporate analysis using web-mining and patent data** ←

The Strategic Technologies for Europe Platform (STEP) is the European action to support EU industry and promote investment in critical technologies in three areas: digital technologies and deep-tech innovation, clean and resource-efficient technologies, and biotechnologies. In line with this framework, the Net-Zero Industry Act (Green Deal Industrial Plan) aims to promote investment in the production capacity of products that are central to achieving the EU's climate neutrality targets.

In this scenario, the research project aims to investigate how industries and sectors are developing in these technological areas and how these technological trajectories impact the positioning and performance of companies. Insights from the analysis will be used to inform the industrial policy. Technological trajectories can be identified as accumulated chains of knowledge that represent the dominant long-term developments in a specific technology.

The research team has made extensive use of patents and citations to examine innovation outcomes at individual and sectoral levels. Global key root and main path analysis will be used to assess trajectories. New data from the Internet will provide a complementary perspective to patents for analyzing strategic technologies. Overall, patents and web analytics will help identify technologies, industries and players (companies) that are on the technological frontier, and track innovation trends and opportunities over time. Research findings will be used to provide evidence-based guidance to companies and institutions and to inform the industrial analysis and policy.