Cover Letter

Dear Members of the Selection Committee,

I am writing to apply for the Innovation Research Boot Camp to be held in Cambridge in July 2026. I am a postdoctoral researcher in economics, with research interests centered on the economics of innovation, artificial intelligence, and firm performance. My work focuses on how firms adopt new technologies and how technological capabilities, strategic choices, and regional innovation ecosystems shape productivity, innovation outcomes, and industrial competitiveness.

My research agenda lies squarely within innovation economics. Using large-scale firm-level data and novel sources such as professional skills data, patent information, and website text, I study the mechanisms through which artificial intelligence influences technological change and economic performance. A central theme of my work is heterogeneity: I examine how the returns to AI adoption differ across firms, strategies, and regional environments, and how innovation policy interacts with firm capabilities to steer technological transformation toward more productive and sustainable paths.

The Innovation Research Boot Camp represents an ideal opportunity for me to deepen my engagement with the core ideas, empirical frameworks, and frontier questions in the economics of innovation. While my training is firmly grounded in applied microeconomics and econometrics, I am keen to further strengthen my theoretical foundations in innovation economics and to better position my research within the broader literature on innovation, productivity, and technology diffusion. I am particularly interested in learning from scholars working on firm dynamics, innovation policy, and the economic impacts of emerging technologies, and in receiving feedback that can help refine my ongoing and future projects.

I believe the boot camp would be especially valuable at this stage of my career, as I consolidate my research agenda and develop new projects at the intersection of AI, innovation policy, and firm performance. I would also welcome the opportunity to actively contribute to discussions with other participants by sharing insights from my empirical work and engaging with diverse methodological approaches.

My recommendation letter will be provided by Professor Marco Cucculelli, my PhD supervisor and PhD coordinator, who is closely familiar with my research and academic development.

Thank you very much for considering my application. I would be grateful for the opportunity to participate in the Innovation Research Boot Camp and to engage with the innovation research community convened by the National Bureau of Economic Research.

Sincerely,
Syed Muhammad Ali Shah

Research statement

My research lies at the intersection of the economics of innovation, artificial intelligence (AI), and firm performance, with a particular focus on how firms' technological capabilities, strategic choices, and regional innovation ecosystems shape the economic returns to new technologies. Using large-scale firm-level data and novel data sources, my work aims to generate policy-relevant evidence on technology adoption, productivity, and innovation dynamics.

My current research examines how AI investments affect firm performance and technological change. In one stream of work, I study how AI adoption fosters technological newness within industrial ecosystems by combining firm-level data with information on AI-skilled graduates and patent acquisitions. The results show that firms investing in AI achieve higher productivity and growth and generate more technologically novel outcomes, especially when they can draw on external knowledge from regional labor markets and innovation spillovers. This evidence highlights the importance of local innovation environments in shaping the effectiveness of firm-level AI investments and points to cumulative learning mechanisms through reinvestment in knowledge.

A second line of research focuses on the heterogeneous paths associated with AI capabilities. By constructing a multidimensional AI Capability Index that captures tangible, human, and intangible knowledge assets, I analyze how AI influences firms' green and brown innovation strategies. The findings reveal a dual nature of AI-driven transformation. While AI capabilities increase the likelihood of both types of innovation, their performance implications differ markedly. Green innovation is associated with sustained productivity and revenue growth, whereas brown innovation generates only short-term efficiency gains. Moreover, government support interacts with firm capabilities, amplifying green innovation among capable firms while potentially reinforcing less sustainable trajectories among weaker ones. This work contributes to ongoing debates on innovation policy and the design of technology support instruments.

In ongoing work, I examine how firms' strategic orientations condition the productivity effects of AI adoption. Combining data on AI-related skills with information extracted from firm websites, I show that productivity gains depend on how AI is integrated into broader strategies, such as international market expansion or customer-centric business models. Related research explores size-dependent effects of AI adoption and the moderating role of regional innovation ecosystems, revealing that AI may generate particularly large gains for small firms and for firms located in less-developed innovation environments, thereby supporting convergence dynamics.

Looking ahead, my future research agenda aims to deepen the analysis of technology diffusion and innovation policy in the context of AI and digital technologies. I plan to study how public policies, skill formation, and regional institutions interact with firm capabilities to shape the long-run impacts of AI on productivity, sustainability, and firm heterogeneity. The Innovation Research Boot Camp would provide an ideal setting to refine my research agenda, strengthen my grounding in innovation economics, and engage with scholars working on closely related questions.

Curriculum Vitae Europass

Syed Muhammad Ali Shah

Applied economist and researcher specializing in the economics of artificial intelligence, innovation, and industrial competitiveness. PhD-trained with more than three years of research experience using firm-level data to analyze R&D investment, technological capabilities, productivity, and innovation outcomes. Strong expertise in econometric analysis, large datasets, and empirical methods, with a clear orientation toward science-for-policy research in the EU context. Experienced in international research environments and collaboration with academic and policy institutions.

Personal Information

Name and family name	**Syed Muhammad Ali Shah**
Nationality	Pakistani
Family status	
Address (Office)	
Phone (Office)	
E-mail	+393444148165 m.alishah44@yahoo.com

Education

- Ph.D. (Economics), University of Marche – Ancona, 2025
  Thesis: Essays on Economics of Artificial Intelligence and Innovation
- M.S. (Applied Economics), University of Lahore – Pakistan, 2018
- B.S. (Economics), University of Sargodha, Pakistan, 2016

PhD Coursework

- Microeconomic Theory
- Econometrics
- Applied Microeconometrics
- Panel Data Methods
- Causal Inference and Program Evaluation
- Industrial Organization
- Statistics
- Mathematics for Economists
- Macroeconomics
- Monetary Economics
- Agent-Based Modelling
- Network Analysis

Academic positions	
2025 – Present	*Post-doctoral researcher* – University of Bari, Italy
2023 – 2024	*Statistics Tutor* - University of Marche, Ancona, Italy
2022 – 2023	*Mathematics Tutor* - University of Marche, Ancona, Italy
2020 – 2022	*Lecturer of Economics* – University of Management and Technology, Lahore, Pakistan
2017-2021	*Lecturer of Economics*- Sharif Educational City, Lahore, Pakistan
Visiting positions	
Nov 2024 – Mar 2025	SBS-E&B, University Libre of Brussels, Brussels, Belgium
Sep 2024 – Nov 2024	Hanken School of Economics, Helsinki, Finland

Summer school	
June 26-30, 2023	*The Economic of Artificial Intelligence* – Barcelona School of Economic, Barcelona, Spain
December 12-20, 2022	*Up cycling and Environmental Challenges Through Artificial Intelligence (European Union Project), Eskisehir, Turkey*

Conferences	
08-09 Sep 2025	27th Annual Conference – Italian Society of Economics and Transport (SIET): Biblioteca Rendello, Monopoli (Bari), Italy
04-05 June 2025	Industry Study Association (ISA) Conference, Massachusetts Institute of Technology (MIT) Boston, USA
12-13 Sep 2024	London Text Analysis Conference, Goldsmith University of London, UK
04-05 June 2025	Industry Study Association (ISA) Conference, California State University, Sacramento, USA
26 April 2024	7th Research Policy Conference for Early Career Researcher (ECRs), Policy and Management Studies of Science, Technology and Innovation.
Seminars	
14 Oct 2025	Laboratory of Applied Economics (LEA), Department of Economics, Management and Business Law, University of Bari,
25 Sep 2024	Dises Ph.D. Seminar, Department of Economics and Social Science, Marche Polytechnic University, Ancona, Italy
13 Oct 2024	Dises Ph.D. Seminar, Department of Economics and Social Science, Marche Polytechnic University, Ancona, Italy
Workshop	
05 November 2025	AI and Innovation: The power of prediction and AI redefining Innovation. OECD, Brussels, Belgium

05-07 Sep 2025	Crash course on Policy Evaluation, University of Bari, Monopoli, Italy
04 December 2024	Times^2 - Research Day, Solvay Brussels School of Economics and Management, University Libre of Brussels, Brussels, Belgium

Awards

2025	Recommendation for the SIE (Society of Italian Economics) Prize for Doctoral Thesis in Economics (XXV Edition).
December 2023	Renato Morandi Innovation Award (Premio in ricordo di Renato Morandi) for significant contribution to the research on AI investments and its impact on industrial ecosystems.
Mar 2022 –Feb 2025	Fully funded Doctoral Scholarship at the Department of Economics and Social Sciences, Polytechnic University of Marche, Ancona, Italy

Submitted Papers

- *Title:* Artificial Intelligence Investment and Firm Performance: Unpacking Technological Newness in Industrial Ecosystems. Co-authors Thommie Burstrom and Marco Cucculelli, submitted in Journal of Technological Forecasting and Social Change.

- *Title:* Artificial Intelligence Capabilities and Dark and Brown side of Innovation: Evidence from Italian Firms. Co-author Michele Cincera and Marco Cucculelli, submitted in Journal of Management Decision.

- *Title:* Artificial Intelligence and Firm Strategy: A Pathway to Enhance Productivity. Co-author Marco Cucculelli and submitted in Journal of Strategy and Innovation.

- *Title:* Artificial Intelligence and Firms: Systematic Review, Conceptual Analysis and Future Research Directions. Co-author Marco Cucculelli and submitted in Journal of Innovation and Knowledge.

- *Title:* Co creation over R&D: External Knowledge as the Engine of Green Innovation in Italian SMEs. Co-author Angela Stefania Bergantino, Marco Cucculelli and Mario Intini, submitted in Journal of Technovation.

- *Title:* Technological Innovation in Transportation: Unpacking Gamification in Sustainable Urban Mobility through Digital Tracking Evidence. Co-author Angela Stefania Bergantino, Mario Intini, submitted in Case studies on transport policies.

Working Papers

- Title: AI Adoption and Firm Performance: Size-Dependent Effects and the Moderating Role of Regional Innovation Ecosystems. Co-author Marco Cucculelli and submitted in Journal of Innovation and Knowledge and submitted in Journal of Economic Geography

- *Title:* Digital Knowledge and Export Performance: The Role of Tangible and Intangible Resources in SMEs. Co-authors Thommie Burstrom and Marco Cucculelli submitted Small Business Economics.

- *Title:* Who's Worth the Millions? Rethinking Football Valuation Through Predictive Modeling in the Big Five European Leagues. Co-author Michele Cincera.

- *Title:* How do SMEs Manage Innovation? Insights from Website Text Mining across European Firms. Co-author Angela Stefania Bergantino and Mario Intini.

Software

Panel data econometrics, firm-level analysis, productivity analysis
STATA, R, LaTeX

Languages

English: C1
Italian: A1

Referee
Journals

Journals (Peer Reviewed): Journal of Small Business & Entrepreneurship, Journal of Big Data, Economia Marche- Journal of Applied Economics.

Date: 22/01/2026
Signature: Syed Muhammad Ali Shah

UNIVERSITÀ POLITECNICA DELLE MARCHE

Dipartimento di Scienze Economiche e Sociali
DISES

Ancona (Italy), 22/01/2026

Dear Members of the Selection Committee,

I am pleased to recommend Dr Syed Muhammad Ali Shah for the Innovation Research Boot Camp 2026.

I supervised his PhD in Economics and served as PhD coordinator during his doctoral studies, and I am therefore well placed to assess his research abilities and academic potential.

Ali's research lies at the intersection of the economics of innovation, artificial intelligence, and firm performance. His doctoral work and subsequent research focus on how firms adopt AI technologies and how technological capabilities, strategic choices, and regional innovation ecosystems shape innovation outcomes and productivity. He has developed a strong research agenda that combines rigorous applied microeconometric methods with questions that are highly relevant for innovation policy and industrial competitiveness.

Methodologically, Ali has excellent training in applied microeconometrics and panel data analysis, and he has demonstrated the ability to work independently with large-scale firm-level datasets. A distinctive feature of his work is the use of novel data sources, including professional skills data, firm websites, patent information, and regional indicators, which he combines in a careful and creative way to study technological change. He can manage complex empirical projects from data construction to interpretation of results.

Beyond technical skills, Ali is an independent and proactive researcher who engages actively with literature and responds very well to feedback. He has presented his work at international conferences and workshops and has shown strong motivation to position his research within the broader field of innovation economics.

I am confident that Ali would benefit greatly from participating in the Innovation Research Boot Camp and that he would contribute meaningfully to discussions with other participants. I recommend him without reservation.

Sincerely,

Marco Cucculelli

Prof Marco Cucculelli (PhD)
Dept of Economics and Social Sciences
Faculty of Economics "Giorgio Fuà" - Università Politecnica delle Marche
Piazzale Martelli 8 60100 - Ancona (Italy)