

SERGIO PELAEZ

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PROFESSIONAL PROFILE

I am a Ph.D. candidate in Science and Technology Policy at the Georgia Institute of Technology. My research investigates how policy influences performance and social alignment in emerging technologies like AI and nanotechnology. A significant aspect of my work involves implementing state-of-the-art language models to extract and analyze value promises from patent text in these fields and examining their role in patent drafting, prosecution, valuation, and technological orientation. Current projects in this space include an analysis of state policy advisory networks in autonomous vehicles and a comprehensive mapping of AI invention in the global south.

Additionally, I have worked for over six years as a consultant with organizations such as the World Bank, the Inter-American Development Bank, and Technopolis Group, where I have examined the drivers of business innovation and its impacts. For example, I've studied how market competition, taxation, and entrepreneurial ecosystems influence firms' innovation activities. My work has also explored the effects of business innovation on the exports of knowledge-intensive business services (KIBS) and the gender disparities within KIBS sectors. Furthermore, I have investigated how industrial policies contribute to increased tax collection.

My skill set includes quantitative (e.g., causal inference, machine learning, text mining, computational social networks) and qualitative (e.g., interviews and focus groups) research methods, along with strong presentation skills for diverse audiences.

EDUCATION

Ph.D. in Public Policy | Concentration in Science and Technology Policy | Minor in Analytics GPA: 4.0/4.0

Georgia Institute of Technology, Atlanta, GA, USA Jan 2021 – Expected Dec 2024

Dissertation Title: "*Value Expressions in Patent Text: A New Method and its Applications to Patent Valuation and Direction*"

Advised by Philip Shapira, Diana Hicks, Alan Marco, Juan D Rogers, and Barbara Ribeiro

M.A. in Economics of Public Policy GPA: 4.63/5.0

Universidad del Rosario, Bogota D.C., Colombia Jul 2016 – Apr 2018

Thesis Title: "*Commodities' cycle and fiscal policy under inconsistent preferences*"

Advised by Juan Pablo Zarate and Juan Jose Echavarria

B.A. in Economics and B.A. in Business GPA: 4.2/5.0

Universidad Autonoma de Manizales, Manizales, Colombia Jul 2009 – Jul 2015

WORK EXPERIENCE

Georgia Institute of Technology Atlanta, GA

Graduate Research Assistant January 2021 – Present

- Developed a new method to classify complex and abstract social science concepts using state-of-the-art language models, including LLMs and BERT-type models
- Extracted and organized millions of societal impact sentences from patent text, theorizing on their normative and instrumental roles in patent drafting, prosecution, valuation, and direction aided by insights from interviews with inventors, lawyers, and examiners
- Evaluated the network structure and impacts of a National Nanotechnology Coordinated Infrastructure (NNCI) facility

Inter-American Development Bank (IDB) Washington D.C./Bogota D.C, Colombia/Buenos Aires, Argentina

Consultant October 2019 – Present

- Awarded research funds after winning two competitive calls for research papers, and subsequently hired to work on two additional papers examining the relationship between firm innovation and market competition, exports, taxation, and industrial policy

Technopolis Group Brighton, UK/Bogota D.C, Colombia

Consultant June 2023 – June 2024

- Co-led the development of a successful research proposal to conduct an analysis examining gender gaps in knowledge-intensive business services, and implemented econometric models and authored reports as part of the project

Department of Economic Development Manizales, Colombia

Economic Advisor March 2020 – January 2021

- Led the design and implementation of an economic reactivation strategy mitigating the impact of the crisis on the local economy and serving as an example for the rest of the country

World Bank Bogota D.C., Colombia

Consultant April 2018 – July 2020

- Consultant on multiple science, technology, and innovation policy projects, including a public expenditure review, a technology adoption survey, a country private sector diagnostic, and entrepreneurship ecosystem mapping. Designed and conducted semi-structured interviews, performed statistical analyses, and authored reports presented to government officials

TEACHING EXPERIENCE

Universidad del Rosario Bogota D.C, Colombia

Lecturer January 2017 – June 2020

- Introductory economics (bachelor's course) and macroeconomic policy (master's course)

Universidad Nacional de Colombia Manizales, Colombia

Lecturer June 2015 – June 2016

- Introductory economics (bachelor's course)

PROFESSIONAL AND PUBLIC SERVICE

- Journal referee: Research Policy (x4), Economics of Innovation and New Technology (x5), Economia-LACEA, Journal of the Knowledge Economy
- Georgia Tech: Coordinator of the School of Public Policy's AI discussion group since January 2023
- External volunteering: Peace volunteer at International Education Peace Volunteers since January 2024

HONORS AND AWARDS

- Received the Outstanding PhD Student Award from Georgia Tech
- Awarded a full PhD scholarship from the Colombian Government and Georgia Tech
- Won the 2017 NASPAA global simulation competition, resulting in a paid internship at the UN World Food Programme in Rome, Italy
- Distinguished as a lead student during undergraduate studies

SKILLS AND INTERESTS

- Skills: Python, R, Stata, API integration, LLM prompt engineering, text mining, machine learning, causal inference, computational social networks, interviews, focus groups, qualitative coding, ethnography
- Interests: Reading, meditation, philosophy, science, tennis, hiking, chess
- Languages: Spanish (Native), English (Fluent)

PUBLICATIONS

Peer-reviewed

- Pelaez, S.,** Verma, G., Ribeiro, B., & Shapira, P. (2024). Large-scale text analysis using generative language models: A case study in discovering public value expressions in AI patents. *Quantitative Science Studies*, 1-26. Available at https://doi.org/10.1162/qss_a_00285
- Pelaez, S.,** Hurtado, B., & Avila-Maecha, J. (2024). Taxation and innovation: evidence from Colombia. *Economics of Innovation and New Technology*, 33(1), 166-184. Available at <https://doi.org/10.1080/10438599.2022.2145560>
- Pelaez, S.,** Youtie, J., & Shapira, P. (2022). Analyzing research outcomes and spillovers at a US nanotechnology user facility. *Journal of Nanoparticle Research*, 24(12), 243. Available at <https://doi.org/10.1007/s11051-022-05601-5>
- Pelaez, S.** (2018). Ciclo de recursos naturales y política fiscal bajo preferencias inconsistentes. *Coyuntura Económica*. 48(1 y 2) Junio-Diciembre, pp. 13-78. Available at <http://hdl.handle.net/11445/3844>

Preprint/working papers

- Pelaez, S.,** Verma, G., Ribeiro, B., & Shapira, P. (2024). "Do Societal Promises Influence Patent Value? An Analysis of Inventions in Artificial Intelligence." *Under Review at Research Policy* and available at SSRN <http://dx.doi.org/10.2139/ssrn.4873074>
- Pelaez, S.,** & Hicks, D. (2024). "Are Societal Promises in Science and Technology Substantiated? The Case of Value Expressions in Patents" *Under Review at Research Policy* and available at SSRN <http://dx.doi.org/10.2139/ssrn.4941820>
- Pelaez, S.** (2024). Exporting Knowledge-Intensive Business Services (KIBS): Innovation and Complementary Factors. *Available at SSRN* <http://dx.doi.org/10.2139/ssrn.4799870>
- Pelaez, S.,** & Gutierrez, J. D. (2023). The Gradual Impact of Sanctioning Cartels on Market Competition: Evidence from the Colombian Manufacturing Sector. *Available at Research Square* <https://doi.org/10.21203/rs.3.rs-2928151/v2>

Work in progress

- Pelaez, S.** "The Fiscal Returns of Industrial Policy." *Planned for submission in Spring 2025* (Work in Progress).
- Walsh, J., J, Jeongyoon., Lee, Y., **Pelaez, S.,** & Ceccagnoli, M. "University Invention Disclosure Policies and Research Commercialization." *Planned for submission in Spring 2025* (Work in Progress).
- Hicks, D., JW, Choi., **Pelaez, S.,** & Kingsley, G. "The Structure of State Policy Advisory Networks: Evidence from U.S. Autonomous Vehicle Reports." *Planned for submission in Summer 2025* (Work in Progress).
- Pelaez, S.** "A Comprehensive Mapping of AI Invention in the Global South." *Planned for submission in Summer 2025* (Work in Progress).