

ANDREW A. TOOLE, Ph.D.

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PROFILE

Economist specializing in the economics of intellectual property, innovation, and competition. As Chief Economist of the U.S. Patent and Trademark Office (2018–2025), led the agency’s economic research on patent examination, patent eligibility, trademarks, and the economic contribution of IP. Associate Professor in the School of Public Policy at Georgia Tech, with more than 25 refereed articles in journals including the *Review of Economics and Statistics*, *Journal of Law & Economics*, *American Economic Journal: Economic Policy*, and *Management Science*. Applies econometrics, causal inference, and machine learning to large-scale patent, trademark, and firm-level data.

AREAS OF EXPERTISE

- Economics of patents and trademarks
- Patent examination, prosecution, and eligibility (*Alice*)
- Patent transactions and secondary patent markets
- R&D investment, uncertainty, and IP value
- Industrial organization, R&D rivalry, and product entry
- Pharmaceutical and biotechnology innovation
- University technology transfer and academic entrepreneurship
- Applied econometrics and causal inference (RCTs, quasi-experiments)
- Machine learning and text analysis of patent data
- USPTO, PatentsView, and Census firm-level microdata

PROFESSIONAL EXPERIENCE

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| U.S. Patent and Trademark Office (USPTO) , Alexandria, VA | August 2015–November 2025 |
| <i>Chief Economist</i> | November 2018–November 2025 |
| <i>Evaluation Officer</i> | October 2020–November 2025 |
| <i>Deputy Chief Economist</i> | August 2015–October 2018 |
- Led the Office of the Chief Economist with a team of 12 economists and data scientists and advised the USPTO Director and Department of Commerce leadership on the economic effects of patent and trademark policy.
 - Directed research on patent eligibility after *Alice*, patent examination outcomes, trademark registrations and product introductions, and the contribution of IP-intensive industries to the U.S. economy.
 - As agency Evaluation Officer under the Foundations for Evidence-Based Policymaking Act, led the agency-wide effort to add evidence for decision-making; convened leadership for priority setting, prepared the learning agenda and program evaluations; co-led a randomized controlled trial of a USPTO pilot program (*AEJ: Economic Policy*, 2025).
 - Co-authored the Report to Congress under the SUCCESS Act (P.L. 115-273, 2019) and the *National Strategy for Inclusive Innovation* (2024).
 - Built and released research data used by academics and practitioners, including the Artificial Intelligence Patent Dataset (AIPD) and, with the U.S. Census Bureau, the Dynamic Business Statistics for U.S. Patenting Firms (2025); led priority-setting for the PatentsView open patent-data platform (2016–2025) on data quality, presentation, and dissemination, and hosted workshops on disambiguation and sex-attribution methods for patent data.
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| USDA Economic Research Service , Washington, DC — <i>Research Economist</i> | August 2010–July 2015 |
| • Research on public and private agricultural and nutrition R&D, public–private research partnerships, and the economics of the U.S. research system. | |

ACADEMIC POSITIONS

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| Associate Professor , School of Public Policy, Georgia Institute of Technology | 2026–present |
| Research Associate , Leibniz Centre for European Economic Research (ZEW) | 2008–present |

Lecturer , Applied Economics Program, Johns Hopkins University	2014–2015
Assistant Professor of Economics , Rutgers University	2003–2010
Faculty Fellow , Irwin Lerner Center for Pharmaceutical Studies, Rutgers University	2007–2010
Assistant Professor of Economics , Illinois State University	2001–2003
Research Associate , Stanford Institute for Economic Policy Research, Stanford University	1998–2001

EDUCATION

Ph.D., Economics , Michigan State University	1998
Dissertation: The role and contribution of federally funded basic research in pharmaceutical innovation.	
M.A., Economics , Michigan State University	1996
B.A., Economics , Kalamazoo College	1989

ADVISORY AND EDITORIAL POSITIONS

Steering Committee , NBER Innovation Information Initiative (i3)	March 2026–present
Advisory Council , Project ATLAS, CSET, Georgetown University	March 2026–present
Associate Editor , <i>Journal of Technology Transfer</i>	May 2017–present
Guest Editor , <i>International Journal of the Economics of Business</i>	2019
Editorial Board , <i>International Journal of Applied Management Science</i>	May 2010–April 2012

HONORS AND AWARDS

Academy of Management Best Paper Awards (two papers)	2022
Department of Commerce Gold Award	2021
USPTO Director’s Awards	2020, 2021, 2023
Best Paper Award, <i>International Journal of the Economics of Business</i>	2019
USPTO Finalist, Supervisor of the Year	2017
USDA Economic Research Service Performance Award and Award of Excellence	2014

DATA AND TECHNICAL SKILLS

Software programming: Stata, SAS, R

Data: USPTO Artificial Intelligence Patent Dataset (AIPD); numerous dataset releases from the Office of the Chief Economist, datasets through PatentsView

PUBLICATIONS

Refereed Journal Articles

- “Challenges Facing Self-Reliant Inventors: Do Patents Help?” (with C. deGrazia, N. Pairoloero, P.A. Pappas, M.H. Teodorescu), *Management Science*, forthcoming.
- “On Your Marks! Trademark Races and Their Impact on Product Introductions,” (with C. Fink, C. Helmers, J. Kolev), *Journal of Economics & Management Strategy*, forthcoming.
- “Closing the Gender Gap in Patenting: Evidence from a Randomized Control Trial at the USPTO,” (with N. Pairoloero, P.A. Pappas, C. deGrazia, M.H. Teodorescu), *American Economic Journal: Economic Policy*, 17(3), 2025.
- “The Artificial Intelligence Patent Dataset (AIPD) 2023 Update,” (with N. Pairoloero, A.V. Giczy, G. Torres, T. Islam Erana, M.A. Finlayson), *Journal of Technology Transfer*, 50(1), 2025.
- “Patent Eligibility after *Alice*: Evidence from USPTO Patent Examination,” (with J. Frumkin, N. Pairoloero, A. Tesfayesus), *Journal of Economics & Management Strategy*, 33(3), 2024.
- “Discovering Value: Women’s Participation in University and Commercial AI Invention,” (with A.V. Giczy, N. Pairoloero), *Nature Biotechnology*, 42(1), 2024.
- “Identifying Artificial Intelligence (AI) Invention: A Novel AI Patent Dataset,” (with A.V. Giczy, N. Pairoloero), *Journal of Technology Transfer*, 47(2), 2022.

- “Innovation Activities and Business Cycles: Are Trademarks a Leading Indicator?” (with A. Myers, C. deGrazia), *Industry and Innovation*, 27(1–2), 2020.
- “The Promise of Machine Learning for Patent Landscaping,” (with A.V. Giczy, J. Forman, N. Pairolo), *Santa Clara High Technology Law Journal*, 36(4), 2020.
- “The Dynamic Relationship between Investments in Brand Equity and Firm Profitability: Evidence Using Trademark Registrations,” (with D. Crass, D. Czarnitzki), *International Journal of the Economics of Business*, 26(1), 2019. (Best Paper Award)
- “Knowledge Creates Markets: The Influence of Entrepreneurial Support and Patent Rights on Academic Entrepreneurship,” (with D. Czarnitzki, T. Doherr, K. Hussinger, P. Schliessler), *European Economic Review*, 86, 2016.
- “University Research Alliances, Absorptive Capacity, and the Contribution of Startups to Employment Growth,” (with D. Czarnitzki, C. Rammer), *Economics of Innovation and New Technology*, 24(5), 2015.
- “Delay and Secrecy: Does Industry Sponsorship Jeopardize Disclosure of Academic Research?” (with D. Czarnitzki, C. Grimpe), *Industrial and Corporate Change*, 24(1), 2015.
- “University Spinoffs and the ‘Performance Premium’,” (with D. Czarnitzki, C. Rammer), *Small Business Economics*, 43, 2014.
- “The Evolving Institutional Structure of Public and Private Agricultural Research,” (with K. Fuglie), *American Journal of Agricultural Economics*, 96(3), 2014.
- “The R&D Investment–Uncertainty Relationship: Do Strategic Rivalry and Firm Size Matter?” (with D. Czarnitzki), *Managerial and Decision Economics*, 34, 2013.
- “The Impact of Public Basic Research on Industrial Innovation: Evidence from the Pharmaceutical Industry,” *Research Policy*, 41(1), 2012.
- “Patent Protection, Market Uncertainty, and R&D Investment,” (with D. Czarnitzki), *Review of Economics and Statistics*, 93(1), 2011.
- “Commercializing Science: Is There a University ‘Brain Drain’ from Academic Entrepreneurship?” (with D. Czarnitzki), *Management Science*, 56(9), 2010.
- “Is There a Trade-off between Academic Research and Faculty Entrepreneurship? Evidence from U.S. NIH Supported Biomedical Researchers,” (with D. Czarnitzki), *Economics of Innovation and New Technology*, 19(5), 2010.
- “Exploring the Relationship between Scientist Human Capital and Firm Performance: The Case of Biomedical Academic Entrepreneurs in the SBIR Program,” (with D. Czarnitzki), *Management Science*, 55(1), 2009.
- “How Does Initial Public Financing Influence Private Incentives for Follow-on Investment in Early-Stage Technologies?” (with C. Turvey), *Journal of Technology Transfer*, 34(1), 2009.
- “Does Public Scientific Research Complement Private Investment in Research and Development in the Pharmaceutical Industry?” *Journal of Law & Economics*, 50(1), 2007.
- “Business R&D and the Interplay of R&D Subsidies and Market Uncertainty,” (with D. Czarnitzki), *Review of Industrial Organization*, 31(3), 2007.
- “Biomedical Academic Entrepreneurship through the SBIR Program,” (with D. Czarnitzki), *Journal of Economic Behavior & Organization*, 63(4), 2007.
- “Is Public R&D a Complement or Substitute for Private R&D? A Review of the Econometric Evidence,” (with P.A. David, B.H. Hall), *Research Policy*, 29(4–5), 2000.

Refereed Conference Proceedings

- “Patents and the Independent Inventor Lifecycle,” (with C. deGrazia, N. Pairolo, P.A. Pappas, M.H. Teodorescu), *Academy of Management Proceedings*, 2022(1), 2022. (Best Paper Award)
- “Closing the Gender Gap in Patenting: Evidence from a Randomized Control Trial at the USPTO,” (with C. deGrazia, N. Pairolo, P.A. Pappas, M.H. Teodorescu), *Academy of Management Proceedings*, 2022(1), 2022. (Best Paper Award)

Working Papers

- “Real Options in Patenting: Uncertainty and Secondary Patent Markets,” (with W. Park, G. Torres, R. Hughes), USPTO Working Paper, 2025.

Edited Volume and Book Chapters

- Resilience and Ingenuity: Global Innovation Responses to Covid-19*, (co-edited with C. Fink, Y. Ménière, R. Veugelers), CEPR Press, Paris & London, 2022.
- “Immunity to the COVID-19 Shock? The Case of U.S. Innovation,” (with W. Park, G. Torres, R. Miller). In *Resilience and Ingenuity: Global Innovation Responses to Covid-19*, C. Fink, Y. Ménière, A.A. Toole, R. Veugelers (eds.), CEPR Press, 2022.
- “The MINER Act of 2006: Innovating for Health and Safety in U.S. Mining,” (with J. Forman, A. Tesfayesus). In *Global Challenges for Innovation in Mining Industries*, A. Daly, G. Humphreys, J. Raffo, G. Valacchi (eds.), Cambridge University Press, 2022.
- “Using Intellectual Property Data to Measure Cross-Border Knowledge Flows,” (with J. Dubbert, A.V. Giczy, N. Pairolero). In *Trade in Knowledge*, A. Taubman, J. Watal (eds.), Cambridge University Press, 2022.
- “Editor’s Introduction: Intellectual Property: Strategy, Measurement and Economic Performance,” *International Journal of the Economics of Business*, 26(1), 2019.
- “R&D Investment under Uncertainty: The Role of R&D Subsidies and Patent Policy,” (with D. Czarnitzki). In *The Economics of Technology Policy*, D. Foray (ed.), Edward Elgar, 2009.
- “Leveraging Public Investments with Private Sector Partnerships: A Review of the Economics Literature,” (with A. Naseem). In *Strategies to Leverage Research Funding: Guiding DOD’s Peer Reviewed Medical Research Programs*, M. McGeary, K.E. Hanna (eds.), National Academies Press, 2004, pp. 141–170.
- “Understanding Entrepreneurship in U.S. Biotechnology: Characteristics, Facilitating Factors, and Policy Challenges.” In *The Emergence of Entrepreneurship Policy: Governance, Start-Ups, and Growth in the Knowledge Economy*, D.M. Hart (ed.), Cambridge University Press, 2003.

Government Reports (Selected)

- “Privatizing the Space Economy: A Perspective on U.S. Government and Private-Sector Participation Based on Patents,” (with USPTO Office of the Chief Economist team), USPTO, January 2025.
- “National Strategy for Inclusive Innovation,” (with USPTO team), USPTO, May 2024.
- “Diagnosing COVID-19: A Perspective from U.S. Patenting Activity,” (with USPTO Office of the Chief Economist team), USPTO, October 2023.
- “USPTO Pilot Program Reduced Gender Disparities in Patenting,” (with N. Pairolero), USPTO, November 2022.
- “Intellectual Property and the U.S. Economy,” (with R. Miller, N. Rada), USPTO, March 2022.
- “Inventing AI: Tracing the Diffusion of AI in U.S. Patents,” (with USPTO Office of the Chief Economist team), USPTO, October 2020.
- “Progress and Potential: 2020 Update on U.S. Women Inventor-Patentees,” (with USPTO Office of the Chief Economist team), USPTO, July 2020.
- “Adjusting to *Alice*: USPTO Patent Examination Outcomes after *Alice Corp. v. CLS Bank International*,” (with N. Pairolero), USPTO, April 2020.
- “Report to Congress Pursuant to P.L. 115-273, the SUCCESS Act,” (with USPTO team), USPTO, October 2019.
- “Progress and Potential: A Profile of Women Inventors on U.S. Patents,” (with USPTO Office of the Chief Economist team), USPTO, February 2019.
- “International Collaboration and Ownership on Patents Issued to Chinese Inventors,” (with R. Miller), USPTO, April 2018.
- “Intellectual Property and the U.S. Economy: 2016 Update,” (with A.C. Marco, A. Tesfayesus), USPTO, September 2016.
- “Improving Health through Nutrition Research: An Overview of the U.S. Nutrition Research System,” (with F. Kuchler), USDA Economic Research Service, Economic Research Report No. 182, 2015.
- “The Complementary Roles of the Public and Private Sectors in U.S. Agricultural Research and Development,” (with J. King, K. Fuglie), USDA Economic Research Service, Economic Brief No. 19, 2012.

SELECTED PRESENTATIONS

- 2026** American Economic Association (ASSA Annual Meeting); National Association for Business Economics (NABE) Econ + Law Summit (invited panelist); Georgia Tech Constitution Day panel, “Intellectual Property in the Age of AI” (panelist); World Intellectual Property Organization (WIPO), Geneva (invited presenter)
- 2025** Asia Pacific Innovation Conference; European Policy for Intellectual Property (EPIP) Conference; Singapore IP Week (invited panelist); George Mason University (invited panelist); U.S. Foreign Service Institute (invited lecturer); CIPO 7th Annual IP Data and Research Conference (selection committee and session chair)
- 2024** World Bank Growth Academy (invited speaker); Allied Security Trust Board of Directors (invited speaker); International Industrial Organization Conference; EPIP Conference, Pisa; Asia Pacific Innovation Conference, Manila
- 2023** Society of Government Economists Annual Conference (keynote); Association of Corporate Patent Counsel Summer Meeting (invited speaker); PatCon 13; International Industrial Organization Conference (presenter and discussant); Federal Laboratory Consortium National Meeting (panelist)
- 2022** EPIP Conference, Cambridge, UK (invited panelist); ASSA Annual Meeting (session chair); CIPO 5th Annual IP Data and Research Conference (invited speaker); Santa Clara Law Innovator Diversity Pilots Conference (invited speaker)
- 2021** OECD Conference on AI in Work, Innovation, Productivity and Skills (invited speaker); WTO Webinar on the Economics of Intellectual Property (invited speaker); Advanced Patent Law Institute (invited speaker); KU Leuven Summer School on Data and Algorithms for Science, Technology and Innovation Studies (keynote); AIEA–NBER Conference (discussant)
- 2020** AIPLA Partnering in Patents (invited speaker); NSF Future of IP Conference (panelist); Santa Clara High Technology Law Journal Machine Learning Symposium (panelist); Grace Hopper Celebration (panelist)
- 2019** EPIP Conference, Zurich (chief economists panel); NBER Summer Institute, Science of Science Funding (discussant); Boston University TPRI IP Day; Technology Transfer Society Annual Meeting; NBER Innovation Information Initiative Conference (panelist)
- 2018** WTO Seminar on IP and Knowledge Flows in a Digital Era, Geneva; PatCon 8, University of San Diego School of Law; Roundtable on Empirical Methods in IP, Northwestern Pritzker School of Law; DOE Technology Transfer Working Group (invited presenter); A-CAPP Brand Protection Strategy Summit (panelist); Academy of Management (professional development workshop)
- 1997–2017** Available on request

TEACHING

- Georgia Institute of Technology:** Research Design for Policy Science (Master’s), Fall 2026; Policy Implementation and Management (Master’s), Spring 2027 (scheduled)
- Johns Hopkins University:** Applied Econometrics (Master’s), 2014
- Rutgers University:** Applied Econometrics I and II (Master’s); Innovation & Entrepreneurship; Principles of Microeconomics, 2003–2010
- Illinois State University:** Econometrics I and II (Master’s); Statistics, 2001–2003

ADVISING AND RESEARCH GRANTS

- Mentoring and advising:** Mentor to USPTO economists C. deGrazia, M.H. Teodorescu, and N. Pairolero; external Ph.D. reader for F. Bracht and V.I. Behrens; Ph.D. committee member (D. Kirkman) and external reader (C. Au), Rutgers; Master’s thesis advisor (M. Ege) and committee member (nine students), Rutgers.
- Research grants (2001–2009):** Ewing Marion Kauffman Foundation (two grants), National Bureau of Economic Research, Pfizer Inc., U.S. Small Business Administration, Rutgers University, and Illinois State University; about \$105,000 in total.

PROFESSIONAL SERVICE

Special Sworn Status, U.S. Census Bureau

2023–2025

Ad hoc referee: *Journal of Applied Econometrics*; *European Economic Review*; *Economic Journal*; *Journal of Industrial Economics*; *Management Science*; *Research Policy*; *Journal of Economics & Management Strategy*; *Journal of Technology Transfer*; *Journal of Business Venturing*; *Contemporary Economic Policy*; *Science and Public Policy*; *Review of Agricultural Economics*; *Journal of Technology, Policy and Management*; *Economics of Innovation and New Technology*; *International Journal of Technology and Globalization*; National Science Foundation; National Academies of Sciences, Engineering, and Medicine; U.S. Department of Agriculture.