TARIKUA G. ERDA

1485 5th Avenue #22A, New York, NY 10035 • 609-906-1981 • te2289@columbia.edu

March 26, 2021

Professor David Robinson
Duke University: The Fuqua School of Business
100 Fuqua Drive
Durham, NC 27708

Dear Prof. Robinson,

I am writing to apply for the 2021 NBER Entrepreneurship Research Boot Camp (ERBC). I am a second-year PhD student in the sustainable development doctoral program at Columbia University's School of International and Public Affairs, where I am a Dean's Fellow. The boot camp would be an excellent fit for my current work and long-term research directions in entrepreneurship and innovation. Given my interdisciplinary graduate training in economics and in the STEM fields relevant to my research, I am also academically well-prepared and uniquely-positioned to take advantage of the boot camp and enrich the learning environment for fellow attendees.

To elaborate, I am interested in a range of research areas concerning human capital and productivity including innovation, entrepreneurship, labor and development economics. One of my current research projects is a study of how natural disasters impact entrepreneurship quantity and quality. Additionally, I am also studying how international treaties on access to genetic materials impact the strategy, behavior, and outcomes of innovators and entrepreneurs in sectors that use genetic materials as production inputs, primarily, aquaculture and biotechnology. I also hope to pursue other research, including at the intersection of discrimination/bias and entrepreneurial ecosystems, in the long term. As such, the boot camp would be instrumental for me to gain exposure to emerging research topics and methods. Being a curious and collaborative researcher, I am also eager to engage with the field experts lecturing at the boot camp as well as other graduate students and surge research collaborations based on shared interests.

I am thrilled about the possibility of using the phenomenal resources of the research boot camp for a prolific research career in a diverse range of topics in entrepreneurship and innovation.

Thank you for considering my application!

Best regards,

Tarikua Erda
PhD Student | Sustainable Development
Columbia University, School of International and Public Affairs

This application packet includes my:

- CV (2 pages)
- List of PhD courses
- Essay (2 pages)

Recommendation letter writer:

- Prof. Jeffrey Shrader (jgs2103@columbia.edu)

Tarikua Erda

Curriculum Vitæ

Columbia University, SIPA
420W 118th St., New York, NY 10027

✉ te2289@columbia.edu
1485 5th Ave, Apt. 22A, New York, NY 10035

EDUCATION

Columbia University, School of International and Public Affairs — New York, NY

- Ph.D. Student, Sustainable Development — Aug. 2019 – present
- *Selected PhD Coursework*: 1st year core sequences in microeconomics and econometrics in the Columbia Economics PhD program | Coursework in environmental health sciences and marine ecology
- *Fields*: Innovation, entrepreneurship, labor, development economics

Princeton University — Princeton, NJ

- B.A., Economics, *cum laude* — Sept. 2013 – Jun. 2017
- *Minors*: Ethical Philosophy | African Studies

RESEARCH

Ongoing work

- MA thesis: impact of natural disasters on entrepreneurship quantity and quality [Advisor: Jeff Shrader]
- Impact of environmental treaties and intellectual property regimes on entrepreneurship and RD
- Perception and bias in STEM academic fields (with Jeff Shrader)

Pre-doctoral work

- Erda, Tarikua G., "Do Remittances Boost Savings and Investment in Sub-Saharan Africa? Evidence from Thirty-Four Countries," *The Visible Hand: Cornell University Peer-Reviewed Undergraduate Economics Journal*, Spring 2017, Vol. XXV, No. I, pp. 27-41.
- "Food For Thought: The Impact of Early Life Undernutrition on Preadolescent Human Capital in Ethiopia." (2017). Princeton University Senior Thesis, Advisor: Prof. Benjamin Moll.

SELECTED EMPLOYMENT

Teaching Assistant

- Disasters and Development (for Profs. John Mutter & Sonali Deraniyagala) — Fall 2020
- Challenges of Sustainable Development (for Prof. Lisa Dale) — Spring 2021

Research Assistant for Prof. Elizabeth Ananat — Sept. 2020 – present
Columbia Population Research Center, Barnard College — New York, NY

Research Assistant, for Prof. Belinda Archibong — Jun. 2020 – Jul. 2020
Barnard College — New York, NY

Analyst, Analysis Group — Aug. 2017 – May 2019
Litigation consulting — Boston, MA

Summer Analyst, BlackRock Inc. — Jun. – Jul. 2016
U.S. Wealth Advisory — Princeton, NJ

Tutor (math and microeconomics), McGraw Center for Teaching & Learning — Sept. 2014 – Dec. 2015
Princeton University — Princeton, NJ

SELECTED FELLOWSHIPS AND SERVICE

- **Deans Fellow**, Columbia University, (Aug. 2019 – Jul. 2025) New York, NY
- **Peer Mentor**, Princeton Women in Economics and Policy, (Sept. 2016 – Jun. 2017) Princeton, NJ

SKILLS

- Stata, R, Python, ArcGIS, Redshift SQL, LaTeX2e
- Familiar with: VBA, SAS

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List of completed and current PhD courses:

Completed Coursework:

In Economics (all from Columbia Economics PhD Program):

- [ECONGR6211] Microeconomic Analysis I
- [ECONGR 6212] Microeconomic Analysis II
- [ECONGR6411] Introduction to Econometrics I
- [ECONGR 6412] Introduction to Econometrics II
- [ECONGR6410] Mathematical Methods for Economists
- [ECONGR 6307] Public and Development Economics

In Sustainable Development (all from the Sustainable Development PhD Program):

- [SDEVU6240] Environmental Science for Sustainable Development
- [SDEVU 9240] Human Ecology
- [SDEVU 9248] Collective Action for Global Sustainable Development
- [SDEV 9245] Environment and Resource Economics

Natural Science and Quantitative Courses:

- [EHSC9300] Environmental Health Sciences
- [QMSS5073] Machine Learning for Social Sciences
- [QMSS5019] Data Analysis with Python

Current Coursework:

- [ECONGR6451] Labor Economics I (from Columbia Economics PhD program)
- [EEEB4195] Marine Conservation Ecology
- [EAEEE4009] GIS: Resource, Environment, and Infrastructure Management

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I am writing to express interest in the 2021 Entrepreneurship Research Boot Camp (ERBC). I am currently a second-year student in the sustainable development PhD program at Columbia University's School of International and Public Affairs. I am interested in a diverse set of research areas concerning human capital and productivity including innovation, entrepreneurship, labor, and development economics. I seek to leverage my interdisciplinary PhD training to understand how various natural and social phenomena—from natural disasters to international treaties to social inequality—influence innovation, entrepreneurial ecosystems, and ultimately the pace and inclusivity of growth. Hence, I am interested in participating in the ERBC as the training and networking opportunities it offers would be a crucial steppingstone for the success of my current work and long-term research interests in entrepreneurship and innovation.

Among my current projects, I am most excited about my MA thesis research, which I am conducting under the guidance of Prof. Jeff Shrader. In this work, I study the impact of natural disasters on entrepreneurship quantity and quality[1] combining data from the Start-up Cartography Project, FEMA, and administrative sources. The impact of natural hazards on economic productivity has only been sparsely studied. Even the few studies that exist focus on physical capital, total productivity and public spending, but not on entrepreneurship—the factor of production credited for combining the other inputs. Do we see a wave of new start-ups emerging in the aftermath of a natural disaster? Are they high or low quality in terms of their ingenuity and growth potential? Are there any patterns explaining disparities in resilience and speed of economic recovery (or lack thereof) across poor and rich communities? My granular approach and focus on entrepreneurial quality (and not just quantity) set up a heterogeneity-rich environment to answer these questions, offering a test of Schumpeterian creative destruction in the most literal sense. Moreover, since the frequency of climatic disasters (e.g. droughts, hurricanes) is expected to increase with climate change, my study has the potential to inform if and how climate mitigation and adaptation policies may better support entrepreneurial ecosystems as an integral part of building community resilience and inclusive prosperity.

I also have some ongoing work involving innovation and entrepreneurship in sectors that conduct R&D on genetic materials (e.g. aquaculture, biotechnology) and how these activities interact with global inequality. I have two motivations for this research agenda. First, after parsing through millions of GenBank[2] genetic sequences in WIPO-registered patents (1988-2020), I have found a dramatic rise in the number of sequences of *Salmo salar* (the Atlantic salmon) associated with patents in the past 5 years, 95 percent of them registered to a single Norwegian multinational. This comes after the whole-genome sequencing of the Atlantic Salmon was completed in 2014. Increasing oligopolization in the aquaculture sector potentially poses not only efficiency concerns (e.g. potential anticommons effects) but also equity concerns, given that 54 percent of the total value of global fish exports originates in developing countries.[3] I am now considering deeper, more causal questions such as whether there exists a wider pattern of disproportionate selection of commercially viable organisms into whole genome sequencing and, afterwards, a proliferation of patents using those gene-sequences. This research agenda would help illuminate if and how biotech entrepreneurship and broader intellectual property interests may shape the trajectory of scientific progress.

My second motivation for studying innovation and entrepreneurship in biodiversity-reliant sectors is informed by the complicated yet fascinating forces that have, in the past 30 years, come to form the regulatory backdrop of researchers' and innovators' ability to acquire biological specimens for R&D. Despite its eponymous goal of encouraging bioprospecting and discouraging biopiracy,[4] the *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization*, has been associated with access restrictions, delays and other transaction costs in its implementation. Yet, blockage of

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[1] Methods borrowing from the work of Guzman and Stern (2019).

[2] GenBank is the NIH's genetic sequence database, an annotated collection of all publicly available DNA sequences. *See*

[3] FAO (2018). Meeting the sustainable development goals.

[4] "Biodiversity prospecting or bioprospecting is the systematic search for biochemical and genetic information in nature in order to develop commercially-valuable products for pharmaceutical, agricultural, cosmetic and other applications." UNDP, (2016); Vandana Shiva, a scholar and environmental activist, describes biopiracy as the patenting of indigenous knowledge related to biodiversity without prior informed consent of communities for the extraction of genetic resources or the use of their knowledge and/or fair compensation. *See* Shiva (2007).

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access to tangible materials has been shown to have a negative impact on follow-on innovation.[5] Here, I am working to systematically quantify the transaction costs faced by R&D sector (currently studying this in the South American context) and hope to investigate how innovators and entrepreneurs in affected sectors have adapted their strategy to the changing regulatory environment. My interdisciplinary training in a PhD program that integrates economic inquiry with graduate-level training in STEM makes me well-suited to address them. The ERBC would equip me with the essential theoretical and empirical toolkit to push this work even further.

Beyond the aforementioned ongoing projects, I am also interested in studying topics at the intersection of entrepreneurship/innovation and social inequality in the future. I seek to understand the cost to productivity that may result from discrimination (especially on the basis of the intersection of gender, race, and class backgrounds) in entrepreneurial social networks and/or financing channels. This is because of a particular gap that I see in the existing literature studying discrimination in entrepreneurial ecosystems: the *intersections* of the various aspects of identity (e.g. age, gender, race, class, sexual orientation, nationality, and so on) that shape an entrepreneur's ideas, experiences, and outcomes have not received sufficient research attention, either because each aspect of identity is studied in isolation, or because the existing real-world data already lack sufficient heterogeneity. I plan to follow a more holistic approach in studying entrepreneurship and discrimination. Additionally, I plan to use experimental methods to generate new data that can enable more heterogeneous analyses. Being a Black woman from Ethiopia, I also have a unique perspective that complements my technical training. These factors, especially if supplemented by the exceptional opportunity that is the ERBC, would enable me to add value to the existing literature on bias, discrimination, and social inequality in entrepreneurial ecosystems.

Given my ongoing work and future research interests discussed above, I am highly interested in participating in the ERBC this summer for two main reasons. First, because I have not taken formal coursework in the areas of innovation and entrepreneurship, the boot camp would be instrumental in helping me develop a strong and broad technical foundation for my (relatively nascent) interest in the topics. I have regularly attended the NBER Productivity Research Lunch Seminars since September 2020, and to a limited extent, also the WEFI Lecture Series. These resources have been key for my growing interest in entrepreneurship and innovation research. Yet, the ability to attend lectures by leading experts and also to learn from a syllabus carefully curated with graduate students like me in mind is an unparalleled opportunity that only the ERBC can provide. In particular, since I have only recently begun exploring entrepreneurial finance topics, I am eager to learn more. Second, I am interested in attending the EBRC because it provides an excellent opportunity to network with a diverse range of leading and active researchers as well as graduate students in entrepreneurship research. I very much enjoy teamwork and collaborating with like-minded researchers and seek it out to both challenge myself and to produce better science. Thus, I would like to participate in the ERBC so that I can engage with, learn from, and forge long-term collaborations with other graduate students interested in entrepreneurship and innovation research.

In sum, I am confident that the NBER entrepreneurship research boot camp is a perfect fit for me given my current research projects and future interests. The opportunity is also well-timed because I am at a pivotal time in my PhD journey when I am finishing my required coursework and focusing on research full-time. Owing to my interdisciplinary graduate-level training and research interests in economics and STEM, I am both well-prepared and uniquely-positioned not only to take advantage of the experience and pursue a prolific career in entrepreneurship and innovation research but also to contribute to the boot camp experience of other attendees.

Thank you for considering my application.

[5] Sampat (2018); Sampat and Williams (2019).

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK
SCHOOL OF INTERNATIONAL AND PUBLIC AFFAIRS

Jeffrey Shrader
420 W 118th St.
New York, NY 10027

March 26, 2021

Professor David Robinson
Duke University
The Fuqua School of Business
100 Fuqua Drive
Durham, NC 27708

Dear Professor Robinson,

I am writing to recommend Tarikua Erda for the 2021 NBER Entrepreneurship Research Boot Camp (ERBC). I am one of Ms. Erda's advisors in the in the Sustainable Development PhD program at Columbia University. I believe she would benefit enormously from attending the Boot Camp, and that she would also make a helpful addition to the students and faculty in attendance. I have known Ms. Erda since she was my student in the first year of the PhD program. I was immediately struck by her insights into the class material, the clarity of her analytical work, and the unique perspective she brought to issues in the class.

The Sustainable Development program combines PhD coursework in economics (the students take the same core microeconomics, core econometrics, and elective classes with the Columbia economics PhD students) with study of a natural science topic of the student's choice. Ms. Erda came into the program with a strong interest in entrepreneurship and technical change. In my class, we study core issues in sustainable development, including the role of technological growth in driving endogenous economic growth (my course is what the PhD students take instead of macro because I cover much of the same material).

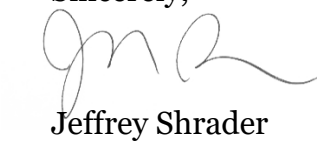
For a class assignment, Ms. Erda combined her interest in intellectual property rights with the material I taught on endogenous growth theory to write a compelling research proposal to study the welfare effects of market power in the "bioprospecting" sector which seeks to find patentable and commercializable uses for naturally occurring genetic or molecular resources.

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Ms. Erda's proposal impressed me highly, so I both sought out Ms. Erda as an advisee and put her in contact with Pierre Azoulay so that she could attend the NBER productivity lunch. She has been attending for the last year and has benefited from the exposure to cutting-edge work in the field. I believe she would benefit even more from attending the Boot Camp. As a PhD student in the same position as Ms. Erda—just in the transition between coursework and full-time work on independent research—my attendance of a similar summer program on environmental economics at Berkeley was instrumental in the development of my dissertation topic.

Ms. Erda is a highly promising scholar who I believe will make important contributions to research on innovation and entrepreneurship over the coming years. If you have any other questions or would like to follow up, please don't hesitate to contact me by email (jgs2103@columbia.edu) or phone (+1 646-484-8517).

Sincerely,



Jeffrey Shrader
Assistant Professor
School of International and Public Affairs
Columbia University