

## EDUCATION

**University of California, Berkeley***Ph.D. in Agricultural and Resource Economics*

Committee: Aprajit Mahajan (Chair), Ethan Ligon, Jeremy Magruder, Supreet Kaur

Dissertation: *Essays on Credit Markets in Rural India*

Berkeley, CA

2020

**London School of Economics and Political Science***MSc. in Economics*

London, United Kingdom

2012

**Indian Institute of Technology, Madras***5 year Integrated MA in Economics (Bachelors & Masters)*

Chennai, India

2011

## FIELDS

*Development Economics, Agricultural & Natural Resource Economics, Environmental Economics*

## PUBLICATIONS AND WORKING PAPERS

“Relief from Usury: Impact of a Self-Help Group Lending Program in Rural India,” with Vivian Hoffmann, Vijayendra Rao, Upamanyu Datta. *Journal of Development Economics*, 2021, Vol 148.

*Abstract.* Provision of low-cost credit to the poor through self-help groups (SHGs) has been embraced as a key poverty-reduction strategy in developing countries, but evidence on the impact of this approach is thin. Using a randomized program rollout over 180 panchayats, we evaluate the impact of a government-led SHG initiative in the Indian state of Bihar. Two years after the start of the program, we find a dramatic increase in SHG membership, borrowing from SHGs, and a corresponding decline in the use of informal credit. Fewer informal lenders are operating in treatment villages, and those who do charge lower interest rates. While these credit market impacts could lead to substantial improvements in economic well-being over time, the short-run impact of the program on such outcomes is modest.

“The Moneylender as Middleman: Formal Credit Supply and Informal Loans in Rural India”. *Revision requested, The Review of Financial Studies*.

*Abstract.* A majority of household borrowing in developing countries is from informal lenders. In this paper, I exploit exogenous weather-induced shocks to household credit demand and variation in bank credit supply to demonstrate that informal moneylenders rely on bank credit to ease lending capital constraints in rural India. I document that informal moneylenders use loans from banks as lending capital, and they increase borrowing from banks following weather-induced increases in household credit demand. Moreover, following an equivalent demand shock, districts with higher predicted bank credit supply see larger increases in household borrowing from moneylenders than those with lower predicted bank credit supply—driven by changes in moneylender supply rather than in household demand for credit overall. These results help explain the persistence of informal credit since they indicate that, rather than competing with informal moneylenders, banks effectively collaborate with them.

“Risk Sharing, Commitment Constraints, and Self-Help Groups,” with Orazio Attanasio, Anjini Kochar, Aprajit Mahajan. *NBER Working Paper No. 31245*.

*Abstract.* Evaluations of group savings and lending programs have largely focused on average impacts, rather than distributional impacts—finding modest effects on long-term economic well-being. In this paper, we exploit the randomized roll-out of a self-help group lending program in rural Bihar, India (Hoffmann et al., 2021) to demonstrate that well-functioning groups facilitate risk-sharing within rural communities. We find no impact of the program on risk-sharing, measured as a reduction in the variance of consumption growth, in the aggregate. However, the program significantly improves risk-sharing in regions where it had greater institutional capacity and was better implemented. Building on our theoretical framework, we provide evidence of a specific channel of impact: program quality and pre-existing scale improve the quality and functioning of groups, which in turn increase the insurance value of the program to communities.

“Weathering Climate Change: How Farmers Learn from Forecast Outcomes,” with Shawn Cole, Tomoko Harigaya.

*Abstract.* Weather-induced agricultural productivity risk reduces farmers’ incomes, and is amplified by climate change. Short-to-medium-range rainfall forecasts (0-to-15 days ahead) can help farmers optimize within-season decisions to mitigate such risk—provided they accurately interpret, trust, and act on the forecasts. Using incentivized lab-in-the-field and real-world experiments with a voice-call weather forecast service, we study how farmers in India update their beliefs following forecasts and forecast outcomes. While farmers have high demand for forecast services, their trust in forecasts decreases after erroneous predictions, with less frequent use after errors. Accuracy in initial interactions mitigates this effect, highlighting the importance of early successes for building longer-term trust in a new technology. Notably, when climate change is made salient, farmers are more likely to use forecasts, and are more tolerant of forecast errors—underscoring the value of forecasts in climate adaptation.

“Self-Help Groups and Women’s Employment in Rural India,” *Working Paper*.

*Abstract.* National and state governments in India have relied on women’s Self-Help Groups (SHGs) to provide access to low-cost credit and savings with the dual intent of financial inclusion and women’s empowerment. I focus on one such SHG initiative in the state of Bihar, Jeevika, and exploit the randomized roll-out of the program to evaluate its impact on women’s labor supply. I find that the program had mixed effects across caste categories. Women from more privileged households increased their labor supply, while both women and men from disadvantaged households decreased their labor supply. The

decline in labor supply among disadvantaged households is driven by reduced participation in agricultural wage labor, and is associated with an increase in agricultural labor wage rates. These results suggest that better access to finance reduces the need to sell labor as a coping mechanism for women from more vulnerable households; while allowing women from privileged households to increase their labor force participation in more 'suitable' occupations.

[“Customizing Weather Forecasts for Farmer Adaptation in Rural India,”](#) with Shawn Cole, Tomoko Harigaya. *Working Paper*.

*Abstract.* Making customized, accurate weather forecasts more accessible to farmers can aid short-run adaptation. For farmers to make more informed decisions through the agricultural season with the aid of forecasts, forecasts need to be customized to best communicate information relevant for farmers' decision-making at different times in the year. Relying on lab-in-the-field and real-world experiments in a mobile-phone based weather forecasting service for farmers in South India, this paper demonstrates that farmers accurately interpret and act on probabilistic information, and prefer probabilistic forecasts to deterministic forecasts.

## TEACHING

*University of California, Berkeley (Graduate Student Instructor)*

Introduction to Economics

2015, 2017, 2018, 2019

Microeconomic Theory with Application to Natural Resources

2016, 2017

Environmental Economics

2016

## EXPERIENCE

### Precision Development (PxD)

*Boston, MA & Berkeley, CA*

*Postdoctoral Researcher & Research Collaborator*

*2021-2025*

- Led the development and launch of a tailored, digital, weather forecast product, reaching 50,000+ coffee farmers in India.
- Led research on weather forecasts and gender inclusivity in digital services for Indian smallholder farmers, developing and implementing lab-in-the-field experiments, A/B tests, and qualitative studies for service design & evaluation.
- Secured grants, contributing to funding sustainability for key projects.
- Mentored research assistants in research design, data analysis, and fieldwork; participated in hiring junior research staff.
- Published blogs, reports, and white papers; presented at conferences & stakeholder meetings.

### University of California, Berkeley

*Berkeley, CA*

*Postdoctoral Scholar, Graduate Student, Research & Teaching Assistant*

*2021-2025*

- Funded by the Bill and Melinda Gates foundation (2020-21) to conduct research on women's self-help groups in India as a postdoc.
- Dissertation research on credit markets in rural India involved geospatial analysis & advanced econometrics.
- Taught seven undergraduate courses as Graduate Student Instructor (GSI), including microeconomic theory & environmental economics.
- Served as Head GSI for Econ 1 ( $\times 3$ ), managing 12 GSIs and developing course material for 800+ students each time.
- Leadership board member of [Women in Economics at Berkeley](#), & organizing committee for the first [Graduate Student Summit for Diversity in Economics](#).

### The World Bank

*Washington, D.C*

*Consultant*

*2015-2019*

- Collaborated on the impact evaluation of Bihar's flagship self-help group lending program.
- Led econometric analysis, producing reports & co-authoring a journal publication.

### Centre de Sciences Humaines

*New Delhi, India*

*Research Assistant*

*2012-2014*

- Assisted Professors Lord Nicholas Stern (LSE) & Himanshu (JNU) in a seven-decade village study in Uttar Pradesh.
- Conducted data consistency checks for India's Socio-Economic Caste Census (2011), consulting for India's Ministry of Rural Development & Planning Commission.
- Contributed to designing inclusion/exclusion criteria in social protection programs for India's Planning Commission.

## INVITED TALKS AND CONFERENCE PRESENTATIONS (2020 ONWARDS)

2025	WEFIDEV-RFS-CEPR Conference on Finance and Development (London School of Economics)
2024	Association of Environmental and Resource Economists Summer Conference, Advances with Field Experiments (London School of Economics), Southern Economic Association Annual Meeting, 19th Annual Conference on Economic Growth and Development (ISI-Delhi)
2023	NBER-ISB Conference on Economic Policy and the Indian Economy, 18th Annual Conference on Economic Growth and Development (ISI-Delhi), Southern Economic Association Annual Meeting, IFPRI (FNP Brown Bag Seminar), Workshop on Risk and Vulnerability (IIT Bombay)
2022	ASSA Annual Meeting, PacDev (UC San Francisco), CSAE Conference (Oxford University), NEUDC (Yale University), SEA Annual Meeting

- 2021 PacDev (UC San Diego), NEUDC (Boston University), Webinar series in Finance and Development (WEFIDEV), Southern Economic Association Annual Meeting
- 2020 Webinar series in Finance and Development (WEFIDEV), NEUDC (Dartmouth University), Center on Food Security and the Environment, Stanford University

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#### MEDIA AND PUBLIC OUTREACH

Blog: “Customized Weather Forecasts for Improved Farmer Decision Making”  
Blog: “Brewing better weather services for Indian coffee farmers”  
Blog: “Leveraging Women’s Groups to Bridge Gender-Specific Information Gaps in India”  
Blog: “Facilitating risk-sharing through self-help groups in Bihar”  
Blog: “Are moneylenders financial intermediaries?”  
Podcast: “Moneylenders and Formal Banking”

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#### REFEREEING SERVICE

*American Economic Journal: Economic Policy, Economic Development and Cultural Change, Empirical Economics, Journal of Development Economics, Journal of Human Resources, Journal of Public Economics, World Development, World Bank Economic Review*

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#### RESEARCH FUNDING, FELLOWSHIPS, AWARDS

*J-PAL King Climate Action Initiative Pilot Grant (with Shawn Cole, Tomoko Harigaya); the iCARE Innovation Foundation (via Precision Development); the Bill and Melinda Gates Foundation (for a one-year postdoc at UC Berkeley); the Wellspring Philanthropic Fund (via Precision Development); the Jean O. Lanjouw Memorial Endowment Grant; UC Berkeley Conference Travel Grant; ARE Travel Grant, IRLE Graduate Student Research Grant (with Manaswini Rao); the Dennis J. Aigner Endowed Graduate Support Fund; Maharaj Kaul Memorial Research Travel Grant; UC Berkeley Graduate Division Summer Grant; Marjorie Deane Financial Journalism Foundation Studentship (London School of Economics); MITACS Globalink Scholarship (University of British Columbia)*

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#### SOFTWARE & LANGUAGES

R (proficient), Stata (proficient), Python (intermediate), Dedoose (proficient)  
English (fluent), Hindi (fluent), Tamil (native), Telugu (basic)

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#### REFERENCES

PROF. SHAWN COLE <a href="mailto:scole@hbs.edu">scole@hbs.edu</a> Professor Harvard Business School Harvard University	PROF. APRAJIT MAHAJAN <a href="mailto:aprajit@berkeley.edu">aprajit@berkeley.edu</a> Associate Professor Dept. of Agricultural & Resource Economics University of California, Berkeley	PROF. VIVIAN HOFFMANN <a href="mailto:V.Hoffmann@cgiar.org">V.Hoffmann@cgiar.org</a> Senior Research Fellow & Associate Professor International Food Policy Research Institute (IFPRI) & Carleton University
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