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DOCTORAL STUDIES

Massachusetts Institute of Technology (MIT)
PhD, Economics, Completed June 2016
DISSERTATION: "Essays on the Design and Targeting of Financial Products: Evidence from Field Experiments in India"

REFERENCES

Professor Benjamin Olken
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PRIOR EDUCATION

Harvard University, Cambridge, MA — 2004-2008
B.A. with concentration in Economics

CITIZENSHIP United States of America

GENDER Female

LANGUAGES Spanish (native), English (fluent), Russian (proficient)

FIELDS

Primary Field: Development Economics
Secondary Field: Labor Economics, Finance

TEACHING EXPERIENCE

14.01 Microeconomics (Undergraduate, MIT) — Spring 2016
Head Teaching Assistant to Professor Jeffrey Harris

14.01 Microeconomics (Undergraduate, MIT) — Fall 2014
Head Teaching Assistant to Professor Jonathan Gruber

14.01 Microeconomics (Undergraduate, MIT) — Spring 2013
Teaching Assistant to Professor Jeffrey Harris

14.21 Health Economics (Undergraduate, MIT) — Spring 2013
Teaching Assistant to Professor Jeffrey Harris

An Analytical Toolkit for International Development (Undergraduate, Harvard University), Teaching Assistant to Professors Asim Khwaja and Rohini Pande — Fall 2012

RELEVANT POSITIONS

Bell Post Doctoral Fellow at the Harvard University Center for Population and Development Studies — 2016-2018

Visiting Scholar at the Harvard Kennedy School (Evidence for Policy Design) — 2017-2018

Research Assistant to Professors Rohini Pande (Harvard Kennedy School) and Erica Field (Duke) — 2007-2011

Research Assistant to Professor Daniel Chen (Toulouse) — 2009-2010

FELLOWSHIPS, HONORS, AND AWARDS

Fellowships and Honors

USAID Research and Innovation Fellowship	2014-2015
National Science Foundation Graduate Fellowship	2010-2014
Hispanic Scholarship Fund Citigroup Scholarship	2006-2007
Goldman Sachs Scholarship for Excellence	2005-2006
John Harvard Scholar	2005-2006
Center for International Development Award	2005-2006

Research Grants

Bill and Melinda Gates Foundation G2P Bangladesh Grant	2017-2019
Bill and Melinda Gates Foundation Pivotal Ventures Grant	2017-2019
IPA Financial Services for the Poor Initiative	2017-2018
Bill and Melinda Gates Foundation Grand Challenges Explorations Grant	2016-2018
PEDL Exploratory Grant	2016-2017
Weiss Family Fund Grant	2015-2016
IZA-DFID GLM-LIC Grant	2014-2015
J-PAL Governance Initiative Pilot Grant	2014-2015
J-PAL Urban Services Initiative Grant	2014-2015
Weiss Family Fund Grant	2014-2015
Asian Development Bank Evaluation Grant	2013-2016
Weiss Family Fund Grant	2013-2014
DFID Evaluation Grant	2013-2015
PEDL PhD Student Exploratory Grant	2013-2015
Agricultural Technology Adoption Initiative (ATAI) Pilot Grant	2013-2014
George and Obie Shultz Grant	2013-2014
IPA SME Research Grant	2011-2013

PROFESSIONAL ACTIVITIES

Referee Services *Quarterly Journal of Economics, Journal of Finance, American Economic Journal: Applied Economics, Journal of Development Economics, Review of Economics and Statistics, American Economic Journal: Economic Policy, Journal of Human Resources.*

Invited Academic Presentations

"Barriers to the Success of Female Owned Microenterprises," American Economic Association Annual Meeting (Scheduled)	2018
"Mechanism Design and Development," American Economic Association Annual Meeting (Scheduled)	2018
Financial Inclusion Working Group, Innovations for Poverty Action	2017
Market Design Working Group, NBER	2017
DIME Research Unit, World Bank	2017
SME Working Group, Innovations for Poverty Action	2017
Emerging Markets Unit, Harvard Business School	2017
Gender and Financial Inclusion Working Group, Innovations for Poverty Action	2016
SME Working Group, Innovations for Poverty Action	2015
SME Development Conference, Private Enterprise Development in Low-income Countries (PEDL)	2013
Partnership Development Conference, Agricultural Technology Adoption Initiative (ATAI)	2013

PUBLICATIONS

"Does the Classic Microfinance Model Discourage Entrepreneurship Among the Poor? Experimental Evidence from India" (with Erica Field, Rohini Pande and John Papp) ***American Economic Review*, 2013, 103(6): 2196-2226.**
Do the repayment requirements of the classic microfinance contract inhibit investment in high-return but illiquid business opportunities among the poor? Using a field experiment, we compare the classic contract which requires that repayment begin immediately after loan disbursement to a contract that includes a two-month grace period. The provision of a grace period increased short-run business investment and long-run profits but also default rates. The results, thus, indicate that debt contracts that require early repayment discourage illiquid risky investment and thereby limit the potential impact of microfinance on microenterprise growth and household poverty.

"Friendship at Work: Can Peer Effects Catalyze Female Entrepreneurship?" (with Erica Field, Seema Jayachandran, and Rohini Pande) ***American Economic Journal: Economic Policy*, 2016, 8(2): 125-53.**
Does a lack of peers contribute to the observed gender gap in entrepreneurial success? A random sample of customers of India's largest women's bank was offered two days of business counseling, and a random subsample was invited to attend with a friend. The intervention significantly increased participants' business activity, but only if they were trained with a friend. Those trained with a friend were more likely to have taken out business loans, were less likely to be housewives, and reported increased business activity and higher household income, with stronger impacts among women subject to social norms that restrict female mobility.

"Do Group Dynamics Influence Social Capital Gains Among Microfinance Clients? Evidence from a Randomized Experiment in Urban India" (with Benjamin Feigenberg, Erica Field, Rohini Pande, and Shayak Sarkar) ***Journal of Policy Analysis and Management*, 2014, 33: 932-949.**
As an intrinsic part of the classic microfinance model, group meetings are intended to employ social capital to ensure timely repayment. Recent research suggests that more frequent meetings can increase social capital among first-time clients. Using randomized variation in group meeting frequency for 174 microfinance groups in

India, we demonstrate that social capital gains associated with more frequent meetings continue to accrue across multiple lending cycles. However, these effects are reduced when group members differ in their borrowing history. In addition, clients who start with low levels of empowerment report higher social capital gains when matched with similar clients. We discuss how current microfinance policy debates overlook the creation of social capital, including through repayment meeting frequency, and we encourage regulators to undertake a holistic understanding of microfinance's impacts.

RESEARCH PAPERS

"Targeting High Ability Entrepreneurs Using Community Information: Mechanism Design in The Field" (with Reshmaan Hussam and Benjamin Roth) **(Job Market Paper)**
Microentrepreneurs in low-income countries have high marginal returns to capital yet face significant credit constraints. Because returns are highly heterogeneous, the cost of assessing credit worthiness often makes lending to this sector unprofitable. In this paper, we show that (1) community knowledge can help overcome information asymmetries prevalent in poorly developed financial markets and that (2) appropriately designed elicitation mechanisms can extract truthful community reports. We asked entrepreneurs in Maharashtra, India to rank their peers on metrics of business profitability and growth potential. To assess the validity of their reports, we then randomly distributed cash grants of USD 100 to a third of these entrepreneurs. We find that information provided by community members is highly predictive of the marginal return to capital: entrepreneurs ranked in the top tercile earn returns of 23% per month, which is three times the average return within the sample. We horserace community rankings against a machine learning prediction built using entrepreneur characteristics and find that peer reports are predictive over and above observable traits. Yet community information is only useful if it is feasible to collect truthful statements. We experimentally vary the elicitation environment and demonstrate agency problems when community members have incentive to lie: accuracy of community reports decreases by a third when cash grants are at stake. But we also show that tools from mechanism design can be used to address these agency problems. Paying for truthfulness using a peer prediction rule fully corrects for strategic misreporting induced by the high-stakes environment. Public reporting and cross-reporting techniques motivated by implementation theory also significantly improve the accuracy of peer reports.

"Habit Formation and Rational Addiction: A Field Experiment in Handwashing" with Reshmaan Hussam, Giovanni Reggiani, and Atonu Rabbani.
Regular handwashing with soap is believed to have substantial impacts on child health in the developing world. Most handwashing campaigns have failed, however, to establish and maintain a regular practice of handwashing. Motivated by scholarship that suggests handwashing is habitual, we design, implement and analyze a randomized field experiment aimed to test the main predictions of the rational addiction model. To reliably measure handwashing, we develop and produce a novel soap dispenser, within which a time-stamped sensor is embedded. We randomize distribution of these soap dispensers as well as provision of monitoring (feedback reports) or monitoring and incentives for daily handwashing. Relative to a control arm in which households receive no dispenser, we find that all treatments generate substantial improvements in child health as measured by child weight and height. Our key test of rational addiction is implemented by informing a subset of households about a future boost in monitoring or

incentives. We find that (1) both monitoring and incentives increase handwashing relative to receiving only a dispenser; (2) these effects persist after monitoring or incentives are removed; and (3) the anticipation of monitoring increases handwashing rates significantly, implying that individuals internalize the habitual nature of handwashing and accumulate habit stock accordingly. Our results are consistent with the key predictions of the rational addiction model, expanding its relevance to settings beyond what are usually considered "addictive" behaviors.

"Household Matters: Returns to Capital among Female Microentrepreneurs" (with Arielle Bernhardt, Erica Field and Rohini Pande) ***Submitted.***
Several field experiments find positive returns to grants for male and not female microentrepreneurs. But these analyses overlook that female entrepreneurs often reside with a male business owner. Using data from randomized trials in India, Sri Lanka and Ghana, we show that the gender gap in microenterprise performance is not due to a gap in aptitude. Instead, low average returns of female-run enterprises reflects the fact that women's capital is typically invested into their husband's enterprise. Household-level income gains are equivalent regardless of the grant or loan recipient's gender.

"On Her Account: Can Strengthening Women's Financial Control Boost Female Labor Supply?" (with Erica Field, Rohini Pande, Simone Schaner, and Charity Troyer Moore)
In collaboration with the state government of Madhya Pradesh, we experimentally varied whether women's wages from India's public workfare program were deposited into female-owned bank accounts instead of into the male household head's account (the status quo). This treatment increased women's work, both in the program and in the private sector, despite no change in market wages. Treatment effects are concentrated among two groups of women: those who had not previously worked for the program and those whose husbands disapprove of women working. These results are at odds with a model of household behavior in which labor force participation decisions only depend on wages and own-preference for leisure. Instead, we argue that they are consistent with a model in which gender norms internalized by men limit women's labor market engagement.

"Paying for the Truth: The Efficacy of Peer Prediction in the Field" (with Benjamin Roth)
There is increasing consensus among development economists that community information is valuable for targeting, and that incentives for accuracy may be a vital part of elicitation. We make an empirical case for peer prediction – a class of mechanisms that overcome many practical difficulties traditional monetary incentives face. Peer prediction allows payments to be contemporaneous with the initial report, reducing surveying costs and eliminating the possibility that respondents don't trust surveyors to return with remuneration. The primary tradeoff is that peer prediction is complicated to explain in practice, and incentive compatibility relies on assumptions that may not hold empirically. We report results from a lab-in-the-field experiment in Maharshtra, India in which we compare peer prediction to a simple payment rule relying on ex-post accuracy. Farmers were asked questions about their neighbors and were told that their reports would be used to determine cash prizes. Both payment rules result in comparable improvement in accuracy. Importantly, by imposing structure on the data we also find evidence that one peer prediction mechanism is incentive compatible given empirically estimated subjective beliefs; respondents

maximize their subjective expected utility by reporting truthfully. This bodes well for situations that require the repeated use of monetary incentives to promote accurate responses – the message that respondents can do no better than to tell the truth will be reinforced with repeated play. Given the broad applicability and the ease of implementation of peer prediction, we hope that this experiment will serve as a catalyst to verify its usefulness in other contexts.

RESEARCH IN PROGRESS

"Market and Person-Level Impacts of G2P Payments in Bangladesh" (with Reshmaan Hussam and Benjamin Roth) **In the field.**
We evaluate the impact of a large-scale government to people (G2P) digital payments platform on the welfare of recipient households and on financial markets in Bangladesh. With our implementing partners, the Department of Social Services and a2i, we have designed a randomized controlled trial which tests three specific hypotheses related to digital G2P payments: (1) Digital G2P payments encourage broader engagement with formal financial services; (2) Digital payments to women can help close the gender gap in financial services; (3) G2P payments can expand the payments network by guaranteeing transaction volume. In Phase 1, we will randomize digital pension payments across 140 unions (a union is a government unit that comprises 5-10 villages; a total of 150,000 pensioners will be impacted). Within the 70 treatment unions, we will additionally run a household level randomization to test the optimal design of the digital platform. In Phase 2, we will incorporate lessons learned regarding optimal G2P design and randomly deliver this optimal platform to the existing treated unions and an expanded sample of 1500 unions. This randomization will allow us to analyze how a large expansion of G2P payments impacts financial markets.

"Mobile Phone Based Interactive Voice Response System to Improve Financial Inclusion" (with Erica Field, Rohini Pande, Simone Schaner, and Charity Troyer Moore) **In the field.**
The Government of India's ambitious Pradhan Mantri Jan Dhan Yojana (PMJDY) scheme has opened over 226 million new bank accounts since its inception in August 2014, with the aim of drawing India's unbanked rural poor into the formal financial system. Although this is an impressive achievement, many of these accounts are dormant, or are only used to receive government benefits. Thus, significant barriers to financial inclusion remain: Low financial literacy rates, especially among women, result in discomfort with new technologies used by last-mile banking kiosks, such as fingerprint readers. Moreover, banking kiosk operators often hold an informational monopoly on account details, as illiterate individuals cannot read transaction receipts. Hence, the rural poor still lack a transparent, verifiable, easily understood way to access information about account balances and the timing of direct deposit transfers. Given the deep mobile phone penetration in rural India and the fact that even low-literacy individuals regularly use the basic calling functions of mobile phones, can mobile technology facilitate access to and improve the quality of financial services for the rural poor? In this project, we partner with a large public Indian bank to test an interactive voice response (IVR) system to give low-income, low-financial-literacy individuals information on account transactions and government benefits receipt.

"Building Trust: Implementing Agricultural Contracts in the Absence of Legal Enforcement" (with Arielle Bernhardt, Reshmaan Hussam, and Benjamin Roth) **Pilot in the field.**

We partner with Organic Mountain Flavor (OMF), a company that connects local Nepalese ginger farmers to the global market for organic dry ginger, to design and evaluate agricultural contracts that help ginger farmers smooth their income through price and purchase guarantees. Because such guarantees are reciprocal – farmers need to accept below market prices in years when demand is high – it is critical for OMF to establish a reputation as a long-term, trustworthy organization among ginger farmers who have no prior experience working with them. In this project, we evaluate various methods for establishing trust between OMF and new clients – using agricultural credit, community enforcement, or fixed investments – in rural Nepal, where legal enforcement of contracts is not possible.

"Understanding Barriers to and Impacts of Women's Cell Phone Adoption in India" (with Erica Field, Rohini Pande, Simone Schaner, and Charity Troyer Moore) **In the field.**
Despite the rapid spread of mobile technology across India, recent data suggest India's women are being left behind. Only 28% of Indian women own a mobile phone as compared to 43% of men, and women account for just a quarter of all Facebook accounts in India. If mobile technologies are crucial to participation in the modern economy, there is a risk that India's gender gap in mobile ownership will exacerbate pre-existing gender gaps in other areas and hinder economic growth. We evaluate the impact of programs that leverage social networks to affect norms governing women's and girls' use of mobile technology and that create economic incentives for women's mobile ownership.

"Increasing the Impact of the National Rural Employment Guarantee Scheme by Identifying Corruption and Reducing Leakages in Electronic Payments" (with Erica Field, Rohini Pande, Simone Schaner, and Charity Troyer Moore) **Fieldwork completed.**
Electronic payment technologies are currently heralded as a panacea to corruption in public programs since, in theory, when benefits are transferred directly to beneficiaries' accounts opportunities for leakage are dramatically reduced. But evidence has shown that while electronic payments are beneficial, they are not a cure-all (Muralidharan et al. 2014). In this project, we use a randomized control trial (reported on in Field at al. 2016) which varied the delivery mechanism of government to person (G2P) payments to understand how design features may differentially impact vulnerable groups and may unintentionally incentivize new forms of corruption. By carefully and systematically tracking fund movements between governments at the central, state, and local level, and between banks and beneficiaries, we trace how corruption varies across payment schemes. In the process, we also provide some of the first rigorous evidence on how women are affected – both within the household and in relationship to the local government – by payment technologies.

"Liquidity and Enterprise Growth: Theory and Evidence from the Indian MFI Crisis and a Long-Run Repayment Flexibility Experiment" (with Erica Field and Rohini Pande) **Fieldwork completed.**
This study explores the long-run impacts on modifications to the classic microfinance contract, business growth, and transition to SME status. This research project uses a seven-year panel dataset that builds on two randomized controlled trials conducted in Kolkata, India beginning in 2006. The RCTs modified the classic microfinance contract – first by offering clients a two-month grace period for loan repayment and second by requiring clients to attend weekly group meetings. The grace period

intervention fostered significant business growth, including a 13% transition to SME status. We track the evolution of these microenterprises over an extensive timeframe and explore: (1) determinants of growth into SME status, (2) persistence of business size differences across treatment and control groups, and (3) comparative performance and entrepreneurial behavior differences between male and female-managed enterprises. These findings will provide new insights on the roles of contract design and individual characteristics in influencing business growth.

"Predicting Credit Worthiness through Digital Engagement with Financial Education Platforms" (with Bilal Zia)
Access to finance remains one of the most significant constraints to the growth and productivity of micro, small, and medium-sized enterprises (MSMEs); at least 200 million MSMEs in developing countries still have unmet credit needs totaling an estimated US$2.2 trillion. Lenders often lack sufficient financial information about MSMEs to make a credit risk assessment and as a result refuse to lend. In this study, we propose a new and unique method of assessing credit worthiness of clients in developing countries: engagement patterns with digital financial education platforms. We partner with a leading digital financial education provider in East Africa, Arifu, which is dedicated to developing and delivering target-specific financial education content that is both easy to use and understand and at the same time stimulating and engaging. We will use the plethora of information collected by Arifu to generate credit scores for individuals and businesses. We will test the validity of this credit scoring mechanisms by randomly allocating loans and measuring how well credit scores predict default and the marginal returns to capital.