PROJECT TITLE: A QUASI-EXPERIMENTAL "POST-MORTEM" STUDY OF A DISCONTINUED INSURANCE PRODUCT IN HAITI

LIST OF PRINCIPLE INVESTIGATORS:

Name: Emily Breza, PhD
Title: Assistant Professor, Columbia University, Graduate School of Business
Address: Uris Hall 821, 3022 Broadway, New York, NY 10027
Phone: 212-851-0171
Fax: 212-854-9895
Email: ebreza@columbia.edu

Name: Daniel Osgood, PhD
Title: Lead Scientist, Financial Instruments Sector Team, Associate Research Scientist in Economic Modeling and Climate, International Research Institute for Climate and Society, Columbia University
Address: 226 Monell, Palisades NY 10964
Phone: 212-854-8780
Fax: 212-854-3609
Email: deo@iri.columbia.edu

Name: Bénédique Paul, PhD
Title: Professor, Economics Department, Quisqueya University and State University of Haiti
Address: 218, avenue Jean-Paul II, Haut de Turgeau, HT6113 Port-au-Prince, BP 796, Haiti
Phone: +509-3401-0003
Email: benedique.paul@uniq.edu.ht

Name: Carine Roenen, MD, MPH
Title: Executive Director, Fonkoze
Address: Fonkoze, #34, Rue Magloire Ambroise, Port-au-Prince, Haïti
Phone: +509-3726-5405
Fax: +509-2245-7254
Email: croenen@fonkoze.org

SCOPE OF WORK

The research will be of 18 months duration, with a six month preparatory phase starting in spring 2014. The project will conclude in summer 2015. The project activities and timeline are shown below.

Activites and Timeline [personell responsible]	
Collect existing data March - July 2014	• Team meeting [all] • Hire Haiti-based research assistant [RA to be hired and supervised by Haiti PI Professor Paul + US PIs] • Identify and clean existing electronic data: administrative, insurance, GIS, and prior survey data [RA + US PIs] • Digitize paper data [RA + US PIs + Captricity] • Meet with Digicel (mobile phone data) and Money Gram (remittance data) to inquite about data request [Fonkoze + US PIs] • Meet with Swiss Re and Guy Carpenter for data request [US PIs]
Preliminary analysis of existing data/reports August – September 2014	• Merge all existing data sources [RA + US PI] • Analysis of existing data and reports to inform survey development. including CDB report [US PI]
Prepare baseline survey October – December 2014	• Training for SIM [led by survey administration firm] • Choose geographic units and participants for survey [US PIs] • Develop and refine survey [US PIs/Survey firm] • Pilot test survey [Survey firm]
Conduct survey January – March 2015	• Survey roll-out [Survey firm]
Analyze survey April – June 2015	• Complete analysis of survey data [US PIs] • Draft policy paper and working paper [US PIs]
Finalize deliverables July 2015 – August 2016	• Finalize policy paper [US PIs] • Policy dissemination meeting among stakeholders [Fonkoze + US PIs] and seminar presentations [US PIs]

BRIEF PROJECT DESCRIPTION

CONTEXT

The proposed research aims to review our implementing partner's (Fonkoze) experience providing a hybrid catastrophe insurance product to 60,000 microcredit clients. Following the January 2010 earthquake, Fonkoze instituted a *mandatory* natural disaster insurance policy covering its 60,000 female borrowers across all ten departments of Haiti. The product, featured at the 2011 World Economic Forum, was designed to reduce the MFI's portfolio risk to natural disasters while supporting borrower advancement in its graduation model. The hybrid index- and indemnity-based policy covered the *institution* against rainfall, wind and seismic shocks based on sharp parametric thresholds in 15 geographic regions, and protected the property (merchandise and house) of all 60,000 *borrowers* through indemnity-based coverage (Tappendorf, 2012). An important innovation in product design was training one peer-elected borrower per credit center to process and verify their peer's claims during credit meetings, thereby leveraging the MFI's machinery for scalable, low cost loss adjustment using village-level, private information (with backup from staff auditing teams). However, the indemnity-based component of the insurance policy covering borrowers was discontinued in late October 2012, while the index-based component covering the institution continues.

AIMS

The initiative, while no longer operational, provides a unique learning opportunity to investigate the failure of the integrated credit-hybrid insurance product retrospectively by

conducting a "post-mortem" investigation. We aim to conduct a quasi-experimental study of the discontinued product using a variety of identification strategies and data sources, including new survey data, administrative banking data, cellular carrier and remittance data, and prior survey data.

We plan to focus on two sources of problems that are potentially interrelated: basis risk in the parametric-based insurance arm and moral hazard in the peer loss adjustment- and indemnity-based insurance arm. Because flooding risk is particularly complex to model physically, using parametric indices to insure against hurricane or rainfall-related property damage is challenging. Even conditional on a well-designed index based on granular, real-time weather data in developed country settings, significant idiosyncratic variation in damages to property due to flooding and extreme rainfall means that index insurance policies will retain large basis risk; and all the more so in mountainous, degraded topographies with sparse weather sensors and high variation in the slope of land (Suri, 2006). Indeed, the payouts from the parametric-based arm of the product did not match those from the indemnity-based arm of the product, alternately overshooting or undershooting by more than +/- 50% and eventually making the policy unsustainable. At the same time, the proportion of verified claims was much higher than anticipated ex-ante, suggesting undue leniency in peer auditing, with borrowers commonly reporting preventable damages, implicating moral hazard.

We will examine what went wrong with the product and why, in order to generate recommendations for possible improved models. In particular, we will investigate basis

risk, ex-ante moral hazard, and their relationship; the role of social proximity in potentially biasing peer-based auditing of insurance claims; crowd-out of informal insurance (remittances) by formal insurance; and the impact of the cancelled indemnity-based insurance arm of the insurance product on beneficiaries and their social ties.

DATA

Our analysis will be based on client-level information from panel data, administrative banking records, newly digitized paper records, recent high resolution maps of watersheds, and if feasible data from mobile phones and remittance companies, as well as a new survey we conduct in the field.

We will leverage pre-existing data:

- **Fonkoze panel data: 2004-present**
    - A panel of 2,000 Fonkoze clients' poverty scores, including two or three assessments per client of assets, food security, business activities, children's schooling, etc.
- **Fonkoze administrative records: 2010-present**
    - Historical data on Fonkoze clients individual loan and savings records (60,000 clients), formal insurance (insurance product records on 50,000 claims and payouts) and social network (using the 12,000 five-member joint liability groups as a measure of social ties).
- **Earth Institute geographic mappings data**
    - On watersheds, slope, and other geographic features in the South of Haiti.

We will make available in digital form the following data:

- **Fonkoze paper surveys: 2004-present**
    - We will attempt to digitize existing records, primarily baseline assessments of assets, food security,, literacy and other poverty indicators of ~5,000 "very poor" and "poor" borrowers conducted prior to the insurance policy

We will conduct a new survey of about 2,000 households:

- On their experience with the insurance product; geographic location and features of their household's location; their consumption, assets, business, etc.
- This data will link to the existing panel data and digitized paper survey data described above (from 2004 to the present).

We will contact our *cellular phone carrier and remittances partners* in Haiti to attempt to:

- Link clients to real-time cellular carrier data on consumption (of cell phone minutes), location and travel patterns (via cell tower triangulation), and social network (calls data).
- Link clients to individual remittance records.

METHODS

We briefly note several features of the policy that allow for clean identification. First, the insurance product was mandatory for all borrowers of the MFI, removing any confounding driven by endogenous uptake. Second, we can exploit the abrupt timing of the discontinuation of the insurance product. Third, individuals were eligible to make a claim based on strict thresholds measured at a local weather station. To measure the impact of receiving a claim versus not receiving a claim, we can compare individuals in areas with weather outcomes just above and just below the threshold value. Finally, because loan forgiveness was a large component of the insurance payout, individuals received differential payouts depending on how much of the loan had already been paid at the time of the weather shock. Individuals who had recently taken a new loan at the time of the weather event (with a large amount of loan outstanding) can be compared to individuals who were close to paying the last installments of their old loans (with a small amount of loan outstanding) nearly ready to take their next new loan. (Breza, 2013 uses a similar identification strategy to analyze a large microfinance default episode).

OUTPUTS

Anticipated outputs include the following:

1. A policy paper that examines Fonkoze's experience and challenges with the product and offers recommendations for ways forward. This will be informed by the following:

2. Academic paper(s) investigating relationship between basis risk and moral hazard, the role of social proximity in biasing peer-based auditing of insurance claims, crowd-out of informal insurance (remittances) by formal insurance, and the impact of the cancelled indemnity-based insurance arm of the insurance product on the economic mobility of microfinance borrowers and their social ties.

REFERENCES:

Breza, Emily (2013). "Peer Effects and Loan Repayment: Evidence from the Krishna Default Crisis." Columbia Business School, Working Paper.

Suri, Tavneet (2011). “Selection and Comparative Advantage in Technology Adoption”, Econometrica, 79 (1), 159–209.

Tappendorf, Tyler (2012). “Evaluation of First Year Results of Fonkoze’s Kore W Natural Catastrophe Insurance for Haitian Micro-Entrepreneurs”. Available at www.fonkoze.org.