

**ACKOFF DOCTORAL STUDENT FELLOWSHIP PROPOSAL:
BEHAVIORAL CONSTRAINTS TO INSURING HEALTH EXPENDITURES IN DEVELOPING COUNTRIES**

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Summary: Poor households frequently behave in detrimental ways when it comes to health care utilization and spending in developing countries. This may be due to credit constraints, but there may also be behavioral factors influencing the use of different *types* of capital to manage risk over time. The Ackoff Doctoral Student Fellowship would support field-based behavioral lab experiments and surveys to investigate the relative impact of these forces and design an insurance mechanism to smooth consumption against minor illnesses.

AIMS & OBJECTIVES

Health shocks are one of the largest sources of uncertainty facing the poor in developing countries. In response, many low- and middle-income countries are experimenting with state-sponsored, commercial or community-based microinsurance products in partnership with private health providers.¹ By pooling the risk of high-cost, low-probability events across households, insurance is a much better financial mechanism for the management of catastrophic hospital expenditures than savings, loans or asset sales. These schemes have already gone a long way toward reducing out-of-pocket expenditures and dramatically lowering the cycle of health-related debt among the poor.²

However, insurance is not necessarily the most cost-effective option to finance medicines and outpatient care. That many households still struggle to pay for these inexpensive, frequent and relatively predictable health events suggests a failure of capital markets or myopic savings behavior rather than an unmet need for formal insurance *per se*. While the latter can certainly serve as a consumption-smoothing mechanism, it is a rather inefficient means of doing so: in addition to administrative overhead, insurance providers must also possess the actuarial expertise necessary to manage adverse selection and moral hazard.

A well-functioning system of precautionary savings and emergency loans should be able to provide the same consumption-smoothing benefits at significantly lower loading costs. Presently, though, it is difficult for the rural poor to regularly access traditional savings accounts.³ When combined with limited access to short-term credit and seasonally-dependent informal market earnings, this liquidity constraint means that poor families frequently lack the available cash necessary for treatment even when it would be considered “affordable” relative to their annual income. In such circumstances, families are forced to draw down their productive assets, borrow from local moneylenders (at annual interest rates up to 40%), or forgo treatment entirely. Indeed, research in Indonesia confirms that households near rural banks were significantly better able to self-insure against health shocks;⁴ similarly, a recent experiment in Kenya found that access to credit and savings reduced the impact of illness on microenterprises.⁵

¹ Morduch, J. “Microinsurance: The Next Revolution” in *Understanding Poverty*. A. Banerjee, R. Bénabou, D. Mookherjee. 2006.

² Recent evaluations of large-scale insurance programs include: King, G., Gakidou, E. et. al. “Public Policy for the Poor? A Randomised Assessment of the Mexican Universal Health Insurance Program,” *The Lancet*, 373: 1447-1454 (2009); Miller, G., D. Pinto & M. Vera-Hernández. “High-Powered Incentives in Developing Country Health Insurance: Evidence from Colombia’s Régimen Subsidiado.” NBER working paper w15456. 2009; and Bauhoff, S., Hotchkiss, D. R. and Smith, O.,” The impact of medical insurance for the poor in Georgia: a regression discontinuity approach.” *Health Economics*, 2010 (online).

³ Even where banks accept savings deposits, they usually require a minimum account balance, carry little or no interest, and charge deposit fees; similarly, formal lines of credit usually require a combination of collateral and a business plan

⁴ Gertler, P., Levine, D. & Moretti, E. “Do Microfinance Programs Help Families Insure Consumption Against Illness?” *Health Economics* 18: 257-273 (2009). Due to collateral restrictions on loans, this effect is primarily through precautionary savings and asset purchases, suggesting that savings should be promoted as a health financing mechanism. However, this research notably focuses on foregone income due to reduced productivity rather than increased expenditures for treatment.

⁵ Dupas, P. and Robinson, J. “Savings Constraints and Microenterprise Development: Evidence from a Field Experiment in Kenya.” NBER Working Paper #14693. Revised November 2010

One solution might be the introduction of supplementary health savings accounts or subsidized health loans for outpatient consultations and pharmaceuticals to help patients self-insure.⁶ Indeed, recent pilot programs suggest that there is latent demand for health savings accounts and emergency loans, even when households have access to unrestricted savings deposits with similar rates and fees.⁷ This points towards behavioral factors and is consistent with emerging evidence on the demand for commitment devices for investment purposes.⁸ Further research on the role of hyperbolic discounting, loss-aversion, probability weighting and mental accounting could help explain why households might prefer restricted-use accounts for precautionary savings, and under which circumstances these health savings would be preferable to insurance or emergency loans.

METHODS

The proposed study will rely on survey data and lab experiments to investigate whether and why poor households make suboptimal investments in outpatient healthcare, and the implications for the potential of health savings and loans to smooth consumption against minor illnesses. Existing cross-sectional data from India and elsewhere reveal that the poor spend disproportionately high out-of-pocket funds on health care, and that frequent, low-cost health shocks represent a large share of that financial burden.⁹ However, more detailed information on the distribution of expenditures over time *within* a household is necessary to accurately assess the risk premium for pharmaceuticals and outpatient care. The Tajik Living Standards Survey (TLSS) is one of the most promising datasets to resolve this question, using panel data for 2007 and 2009.¹⁰ The TLSS survey includes detailed health utilization and expenditure data, and fixed effects can disaggregate variation over time from variation across households (i.e. need for consumption smoothing versus risk pooling). In turn, this will indicate whether households are currently able to smooth their consumption against routine health shocks using informal mechanisms, or if there is evidence that liquidity constraints are affecting the utilization of health care.¹¹

The TLSS data is expected to empirically demonstrate demand for a health insurance and/or consumption smoothing mechanism, both by calculating variance-based risk premiums (using conditional means) and by regressing non-medical consumption on health shocks.¹² Controlling for household savings and access to capital should reduce the latter effect, as should financial literacy and health knowledge; however, these alone cannot explain the observed demand for health savings. It is possible that behavioral factors are impeding households' health utilization in addition to these capital constraints and imperfect information, which would be supported by evidence of incomplete insurance even in relatively urban, educated households.

In this context, the proposed study will compare the previously estimated risk premiums with results from a series of behavioral lab experiments designed to elicit household willingness-to-pay for various combinations of unrestricted and health-specific savings accounts, loans and insurance in relation to their discount rate and tolerance for risk (using a contingent valuation approach).¹³ As envisioned, the study would include a sample of urban and rural households across

⁶ Hanvoravongchai, T. "Medical Savings Accounts: Lessons Learned from Limited International Experience." World Health Organization discussion paper, 2002.

⁷ Appendix detailing the nine known examples is available upon request. For external resources, see <http://www.ffhtechical.org/resources/microfinance-health>, including: Gray, B., McCord, R. et al. "Microfinance and Health Protection Initiative Research Summary Report: RCPB." Freedom from Hunger Research Report no. 9E (2010); Reinsch, M. and Ruaz, F. "Costs and Benefits of Providing Health Savings and Savings Loans: RCPB's Experience in Burkina Faso." Freedom from Hunger Research Report no. 10E (2010); and "Health Savings: A Technical Note."

⁸ Ashraf, N., D. Karlan and W. Yin. "Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines." *Quarterly Journal of Economics*, 2006.

⁹ Author's analysis of the India Human Development Survey, available at <http://ihds.umd.edu>. Desai, Sonalde, Amaresh Dubey, B.L. Joshi, Mitali Sen, Abusaleh Shariff, and Reeve Vanneman. India Human Development Survey. ICPSR22626-v2. University of Maryland and National Council of Applied Economic Research, New Delhi 2007.

¹⁰ Data available at <http://go.worldbank.org/HVIFY0X2BK0>. For a descriptive analysis of the relevant variables from a 2003 cross-section, see Habibov, N. "What determines healthcare utilization and related out-of-pocket expenditures in Tajikistan? Lessons from a national survey." *International Journal of Public Health*, 54(2009):260–266.

¹¹ This will attempt to replicate the Gertler and Gruber analysis using the Tajik data.

¹² This is consistent with cross-sectional analyses that assume 3- or 6-month sickness spells, most notably including Pauly, M., F. Blavin & S. Meghan, "How Private, Voluntary Insurance Can Work in Developing Countries." *Health Affairs*, 2009. This study will expand on the *Health Affairs* analysis using the TLSS panel data, with Mark Pauly serving as the academic advisor.

¹³ This study would draw on similar methods and analysis as Jeremy Tobacman's research on integrating savings into weather insurance, and will benefit from his guidance as a member of my dissertation committee.

the five oblasts of Tajikistan, and would be administered using Qualtrics Research Suite software at multiple computer labs from July through December 2011.¹⁴

Under expected utility theory, households should prefer precautionary savings vehicles over loans for predictable health expenses to smooth consumption over a longer earnings period. *Among* savings vehicles, households should opt to consolidate savings in an unrestricted account to minimize transaction costs and to afford flexibility across different spending categories. And yet there is significant observed demand for restricted health savings accounts in addition to “regular” savings accounts, as well as reliance on lending for many routine health expenses. This raises two important questions, which this study aims to address: (1) what factors drive household preferences for savings versus loans or insurance products for health expenditures; and (2) why might health savings accounts be favored over unrestricted accounts?

From an informal insurance perspective, precautionary savings vehicles are hypothetically superior to emergency loans since they can smooth consumption over a longer earnings period (assuming a normal risk distribution). Yet prospect theory suggests if individuals are risk-seeking in losses, then they might choose a loan product instead; this is particularly true if there is a tendency to underweight the probability or magnitude of a health shock, which could vary across medical conditions or level of health-specific education. For similar reasons, prospect theory does not predict demand for a *formal* insurance product, which utility theory predicts would be most useful precisely when probabilities are lowest.

A second hypothesis is that individuals are attracted to health savings accounts as a commitment device to resolve their own present-biased preferences (“myopia”). This could be modeled either in terms of hyperbolic discounting or temptation goods,¹⁵ and predicts that a required monthly contribution would have a greater impact on the level of savings than an optional savings schedule.¹⁶ However, an alternative explanation is that health accounts are simply used as a bargaining tool when a woman’s preferences differ from her husband’s or those of extended family members. In either case, the greater flexibility of regular savings is actually a disadvantage.

To test these hypotheses, study participants would be asked about their current savings schedule, levels and vehicles; intrahousehold decisionmaking; the perceived probability and expected costs of illness; past health spending and related loans; and preferences regarding product design or alternatives. Contingent valuation methods would also be used to assess participants’ discount rates, risk aversion, and willingness-to-pay for a range of actuarially-equivalent financial products. The survey would conclude with a series of games to test whether and how access to different *types* of capital would affect health utilization under equivalent scenarios.

The results will generate estimates of the level of demand for health savings and loans and suggest the optimal mix of savings, loans and insurance for an integrated health financing mechanism. Ideally, this dissertation research would eventually lead to a randomized control trial of the resulting product design. More broadly, the empirical findings can be situated within an investment model of health to explain why the current level of health utilization is suboptimal due to capital constraints, as well as behavioral theory regarding the use of commitment devices for precautionary savings.

FACULTY APPROVAL

Jeremy Tobacman
Assistant Professor, Department of Business & Public Policy

¹⁴ Conducting the study in Tajikistan would permit the greatest internal validity with the existing panel analysis, and is supported by the disproportionate out-of-pocket spending for health. However, the same research could be carried out in any developing country with high private health spending if necessary. India would be the most likely alternative, though, as the Poverty Action Lab and Center for Microfinance both have existing behavioral lab infrastructure, and it could potentially complement data from the second round of the India Human Development Survey (available in 2013).

¹⁵ Banerjee, A. and S. Mullainathan. “The Shape of Temptation: Implications for the Economic Lives of the Poor.” Working paper, 2009.

¹⁶ The observed demand for outpatient insurance in other developing countries could also be explained by myopic “sophisticates” if the perceived benefit lies primarily in prepaying the premium (i.e. a commitment device) rather than in pooling risk.

PROJECT BUDGET

Data Collection: [REDACTED] for the activities described below, as well as incidental expenses.

- Compensation for survey participants' time and travel costs
- Domestic travel from Dushanbe to identify and survey sample, including rural site visits
- Translation of the questionnaire and instructions into Russian and Tajik, as well as the services of an interpreter during site visits
- Computer software and facility rental (such as local internet cafes or NGO training facilities) to manage the survey and lab experiments

International Airfare: [REDACTED] roundtrip from the US to Tajikistan for the principal investigator (Air Baltic)

Total Grant Request: [REDACTED]

**Researcher time and living expenses will be covered under a Wharton doctoral stipend, and limited travel funds may also be available under the Wharton PhD travel grant. A separate research grant was submitted to the Microinsurance Innovation Facility at the International Labor Organization, which would enable a larger sample size.*