PRE-ANALYSIS PLAN

Training Policymakers in Econometrics:

Evidence from Two Experiments in Pakistan

Introduction.— Over the last half century empirical economics has gone through a paradigm shift. The credibility revolution, with its careful attention to causality, has presented itself as a new paradigm for "taking the con out of econometrics" (Leamer 1983). We hope to study causal effects of a paradigm shift in the social sciences on practitioners–policymakers–using the training of the paradigm as its instrument. There seems to be consensus emerging in the literature that policymakers are highly averse to shifting their beliefs and engage in motivated reasoning to justify their initial policy choices (Baekgaard et al. 2019; Banuri et al. 2019; Metzger et al., 2020; Vivalt and Coville 2021; Lu and Chen 2021). Sticking to priors and being inattentive to evidence may stymie the implementation of good policies that might otherwise spur economic development (Kremer et al. 2019).

Research Questions.— How can policymakers be made more receptive to evidence? Will training them in concepts associated with the credibility revolution make them more likely to shift their beliefs? Will it induce them to change their policy choices? Can the econometrics training impact State capacity? Can it increase uptake of tax policy for which there is causal evidence?

Experiment 1: Junior Ministers. — The first experiment involves an intensive training where we aim to maximize the comprehension, retention, and utilization of the educational materials. Namely, we augmented the book receipt with lectures from the books' authors, namely, Joshua Angrist and Daniel Siegel, along with competitive writing assignments. As part of the training program, deputy ministers were assigned to write two essays. The first essay was to summarize *every* chapter of their assigned book, while the second essay involved discussing how the materials would apply to their career. The junior ministers in each treatment group also participated in a zoom session to present, discuss the lessons and applications of their assigned book in a structured discussion.

Experiment 2: Tax Officers. — The second experiment involved tax officers randomized into econometrics versus a placebo training. Identical to our first experiment, the officers receive writing assignments, present their learnings in class and engage in a structured discussion.

Difference Between Experiment 1 versus Follow-on Experiment 2. — There are two differences between the first and the second experiment. The first is that the second experiment also involves a cross-randomization of two signals. Half of tax officers randomly receive an email a one-page summary of results from a paper that provides experimental evidence that sending tax reminders increases tax collection, while the remaining half are randomized to receive the handout where a correlational study that tax reminders increase tax collection. Their prior and posterior beliefs on impact of tax reminders on tax collection are also solicited. The second difference between the two experiments is that in the experiment with tax officers, we have a natural policy outcome, on tax reminders sent and tax collection, linked from treated tax officers to their tax district jurisdictions.

Empirical Specification.— The impact of the econometrics training will be evaluated by comparing outcomes across groups in a simple regression framework. For each bureaucrat, the estimation equation is as follows:

$$Y_i = \alpha + \beta\, Econometrics\, Training_i + \boldsymbol{X}_i\, \mu + \epsilon_i \qquad (1)$$

We will compute treatment effects via OLS with robust standard errors. The experiment with deputy ministers will also solicit demand for metrics training and control for this in all specifications. We will provide results with and without all available controls.

Outcomes Variables. — In the first experiment with deputy ministers, the outcomes on policy decision are for fiscal support or budgetary requests of deputy ministers from the Finance Ministry of Pakistan. We policy choices data for fiscal support of the deputy ministers is available for three policies: one related to our signal of RCT evidence (deworming policy) and two placebo policies (school and orphanage renovations) unrelated to the signal. The funding requests are made roughly a month before the federal budget for the next fiscal year is announced every year. The data on Willingness-to-Pay, attitudes and beliefs were collected by the research team. In the second experiment with tax officers, the main outcomes involve policy adoption to send tax reminder letters and for total tax collected by the tax officer.

Robustness Analysis.— The following robustness tests will be conducted at a minimum: check for balance over individual characteristics, test for differential attrition and correction for multiple hypotheses will be done.

Hypotheses.— We will test the following main hypotheses:

H1: Econometrics training impact policy choices on deworming (Experiment 1)

H2: Econometrics training has no impact on policy choices on orphanage and school renovations (Experiment 1)

H3: Econometrics training has impact on sending tax reminder letters (Experiment 2)

H4: Econometrics training has impact on tax collection (Experiment 2)

We will test the following supplementary hypotheses:

H5: Econometrics training will increase more the adoption of sending tax reminder for those officers that received the signal study to send tax reminders with RCT evidence (Experiment 2)

H6: Econometrics training will not impact or decrease the adoption of sending tax reminder for those officers that received the signal study to send tax reminders with correlational evidence (Experiment 2)