

Pre-Analysis Plan for *Motivating Bureaucrats: Autonomy vs Performance Pay for Public Procurement in Pakistan*

Oriana Bandiera Michael Carlos Best Adnan Qadir Khan Andrea Prat

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1 Analysis

Our main analysis of the experimental results will consist of running regressions of the form

$$y_{it} = \alpha + \beta_1 T_{1,it} + \beta_2 T_{2,it} + \beta_3 T_{1,it} \times T_{2,it} + \mathbf{S}_{igt} \delta + \varepsilon_{igt} \quad (1)$$

where y_{it} is one of the outcomes of interest described below in section 2; $T_{1,it}$ is a dummy indicating that the Drawing and Disbursing Officer (DDO) making purchase i is in the performance incentives treatment at time t ; $T_{2,it}$ is a dummy indicating that the DDO is in the rules treatment at time t ; \mathbf{S}_{igt} is a vector of stratification variables used in the randomization (department and district) and ε_{igt} is a residual. We will estimate both average and quantile treatment effects, and perform randomization inference whenever our sample sizes make it appropriate.

2 Outcome variables

2.1 Main outcomes

Our main outcome is value for money, as measured by the quality-adjusted unit price paid for each item. To create it we follow [Bandiera *et al.* \(2009\)](#) and run regressions of the following form for each good

$$p_{igt} = \mathbf{X}_{igt} \beta + \gamma_t + \text{department}_i + \text{district}_i + \mu_{igt} \quad (2)$$

where p_{igt} is the log of the unit price paid in transaction i for good g in month t ; \mathbf{X}_{igt} is a vector of observables including the log quantity purchased and all the good's attributes; γ_t are month fixed effects, department_i are department fixed effects; district_i are district fixed effects; and μ_{igt} is a residual which will become our main outcome of interest: the quality-adjusted log unit-price.

We will also estimate treatment effects on two main other outcomes. First, measures of how much time the bureaucrat spends on procurement relative to other duties. Second, whether the bureaucrat successfully spends his/her entire budget before the end of the fiscal year, and if not, how much of it they are able to spend.

2.2 Other outcomes

In addition to our main outcomes, we will study impacts on two secondary outcomes that may be affected by the treatments.

1. *Legal/procedural compliance.* We will measure this using the number and type of irregularities reported in supervisor and auditor reports on the DDO.
2. *Favoring corrupt DDOs.* We will measure this in two ways. First, by looking for heterogeneous treatment effects by corruptibility as measured by the DDO's score on a dice game we implemented based on [Fischbacher & Föllmi-Heusi \(2013\)](#) and [Hanna & Wang \(2013\)](#). The protocol is attached in section 5 of the attached survey instrument. Second, by looking for heterogeneous effects by the survey measure of political capital in question 111 of the attached survey instrument.

3 Imperfect compliance

There are two reasons that being assigned to a treatment group will not necessarily mean that a DDO is treated. First, some of the treatments required the DDOs and their staff to actively decide to participate. Second, some DDOs may have found the treatments hard to understand and/or may have believed that the promises the treatments contained were not credible.

Below we describe how we can measure imperfect compliance. With these measures we can then instrument for actual takeup with treatment assignment to estimate treatment effects on the treated.

3.1 Takeup

We can measure takeup of the Punjab Online Procurement System (POPS) by the number of trainings and information sessions that a DDO was invited to that he/she actually attended. Furthermore we can compare the POPS data to administrative data on expenditures from the finance department to calculate how much of the expenditure that should be recorded in POPS actually appears in POPS.

The rules treatment requires the DDOs and their staff to actively take up the treatment. To measure this we will use the following measures

- Time taken to release budget relative to previous years

- refusal of imprest money
- receipt of imprest money
- Survey responses on whether the DDO has read the pre-audit checklist. Specifically, responses to survey questions 319–323 in the attached survey.

3.2 Understanding & credibility

To measure the DDOs' perceptions of what the treatments entailed we use their responses to survey questions 301–362 in the attached survey. In addition, for the incentives group, we use whether a DDO had sufficient entries in POPS to be ranked in one of the interim performance evaluations as a proxy for the credibility of the treatment.

4 Mechanisms

4.1 Ways of achieving better value for money

To measure *how* the relationships between DDOs and vendors change in response to the treatments we measure

- Whether DDOs change vendors
- Whether DDOs achieve better prices from the same vendors
- Whether DDOs get more quotes or a wider range of prices quoted to them
- Whether DDOs get quotes from a larger set of vendors

4.2 Time use

To measure *how* DDOs change their behavior to improve value for money, we gather data on the way they allocate their effort in procurement. In particular, we use their responses to questions 201–209 in the attached survey.

4.3 Perceptions of reasons for (lack of) improvement

To measure the DDOs' perceptions of how the treatments affected their procurement behavior we use their responses to survey questions 201–209 and 301–362 in the attached survey.

4.4 Traits that might determine response

There are a number of DDO traits that might influence how they respond to the treatments. We will use data on

1. Tenure as DDO, experience in the Civil service, and position on the pay scale (questions 101–108 of the attached survey)
2. Proximity to Accountant General's Office/District Accounts Office
3. Proximity to line department's secretariat
4. Size of budget allocated
5. Proximity to supervisors
6. IQ (RAVEN's matrices in section 4 of the attached survey)
7. Reason to join civil service (question 109 of the attached survey)

References

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