



Evaluating the Impact of Open Bidding on Corruption in Chinese Government Procurement

Ruishi Wang, Applied Data Analysis, Wesleyan University
Faculty Sponsor: Xiaoxue Zhao

Introduction

- In China, public procurement accounts for a significant share of government spending and is especially vulnerable to corruption. Among them, open bidding is the dominant procurement method.
- Open bidding is widely promoted as a tool to enhance transparency and reduce corruption. According to the *Law of the People's Republic of China on Bid Invitation and Bidding*, open bidding mandates that government officials publicly announce bids to any eligible legal entities and organizations. In addition, open bidding is the most competitive method and the least susceptible to corruption (Gong and Zhou, 2015).
- However, in many settings, open bidding is selectively implemented, and its effectiveness in curbing corruption remains uncertain. Procurement officials still find ways to circumvent formal rules by informal rules especially through evading open bidding (Gong and Zhou, 2015).
- This study uses a regression discontinuity design exploiting the policy threshold for mandatory open bidding in China to identify its causal effect on procurement outcomes and corruption proxies. Specifically, it investigates how adopting open bidding reduces procurement prices paid by local governments..
- There are two challenges faced by the project. The first one is to establish a causal relationship between open bidding and corruption proxies. Due to potential endogeneity, open bidding may be systematically related to unobserved factors. The second is that corruption is rarely directly observable in procurement data. This requires constructing credible proxy variables that can reflect corrupt behavior.

Data & Methods

Data

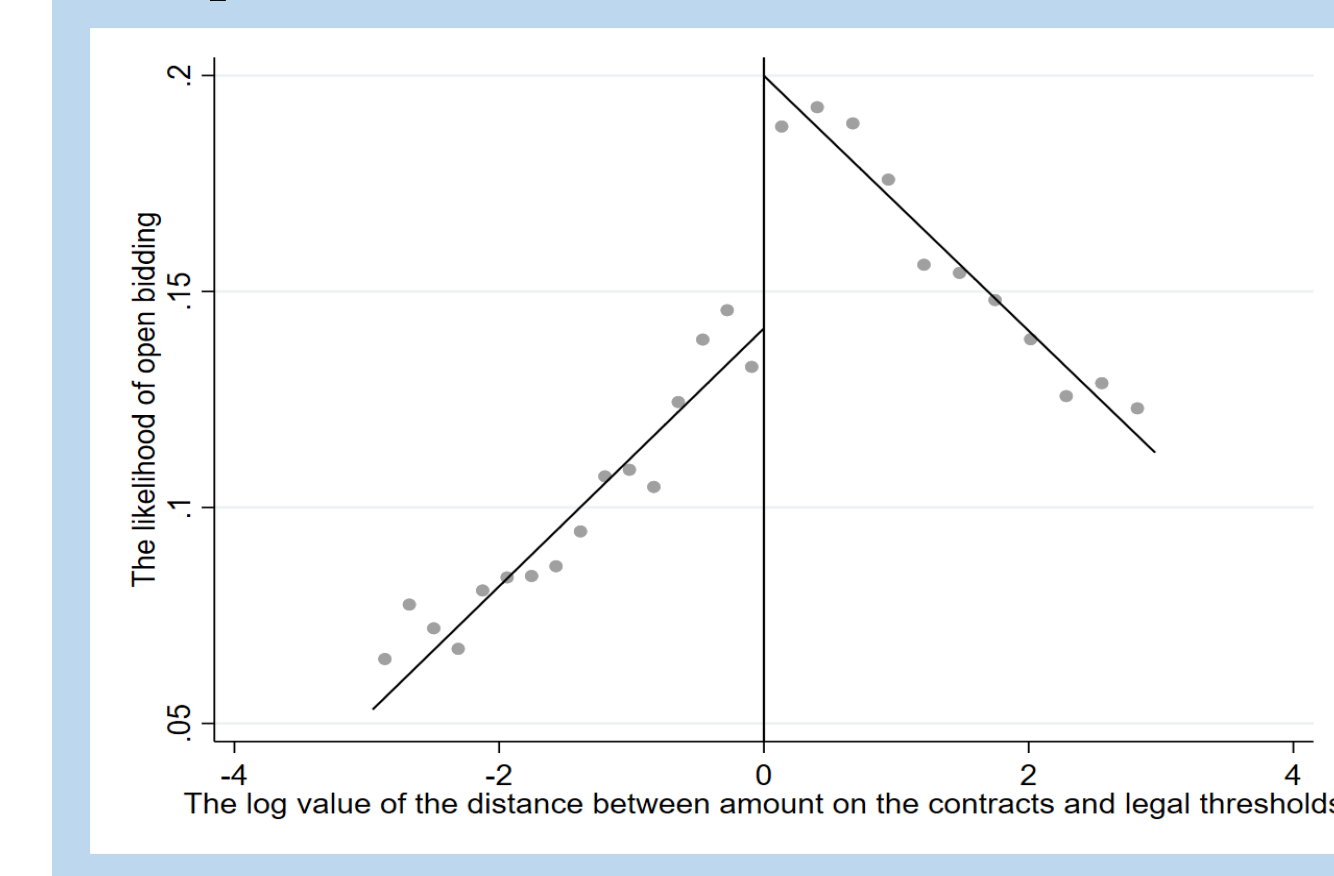
- The data is collected from the official government procurement website (www.ccgp.gov.cn) and it contains information of 792,931 contracts procured by local and central governments. However, around 85% of these contracts lack important information regarding contract detail for analysis, leaving 119,352 available complete observation.
- Threshold data is collected manually from official websites of central and local governments. Many thresholds before 2015 can no longer be found on the internet and over 15% of legal thresholds are missing.

Method

- Using the mandatory threshold in China's procurement policy, this research leverages a quasi-experimental design to compare procurement contracts just above and just below the cutoff. Because this threshold compels open bidding above a certain contract amount, it introduces exogenous variation in bidding method assignment that is plausibly unrelated to underlying corruption risks.
- A regression discontinuity (RD) design is employed to estimate the causal effect of open bidding on corruption proxies. By focusing on a narrow window around the threshold, the RD approach assumes that contracts near the cutoff are comparable in characteristics, and any discontinuity in outcomes can be attributed to the implementation of mandatory open bidding.
- Running Variable (X_i) is log value of the distance between the amount on the contracts and the legal thresholds (cutoff=0, where the contract amount just reaches the legal threshold). Dependent variable (Y_i) is the probability of using open bidding method in the first stage and corruption proxies in the second stage.
- $Y_i = f(X_i) + \beta D_i + e_i = f(X_i) + \beta(X_i \geq X_0) + e_i$, where $D_i = \begin{cases} 1, & \text{if } X_i \geq X_0 \\ 0, & \text{if } X_i < X_0 \end{cases}$

First Stage Results

Figure 1. RD plot between log value of Distance and Open Bidding with Evenly-Spaced Bins and 2 times the MSE-optimal Bandwidth

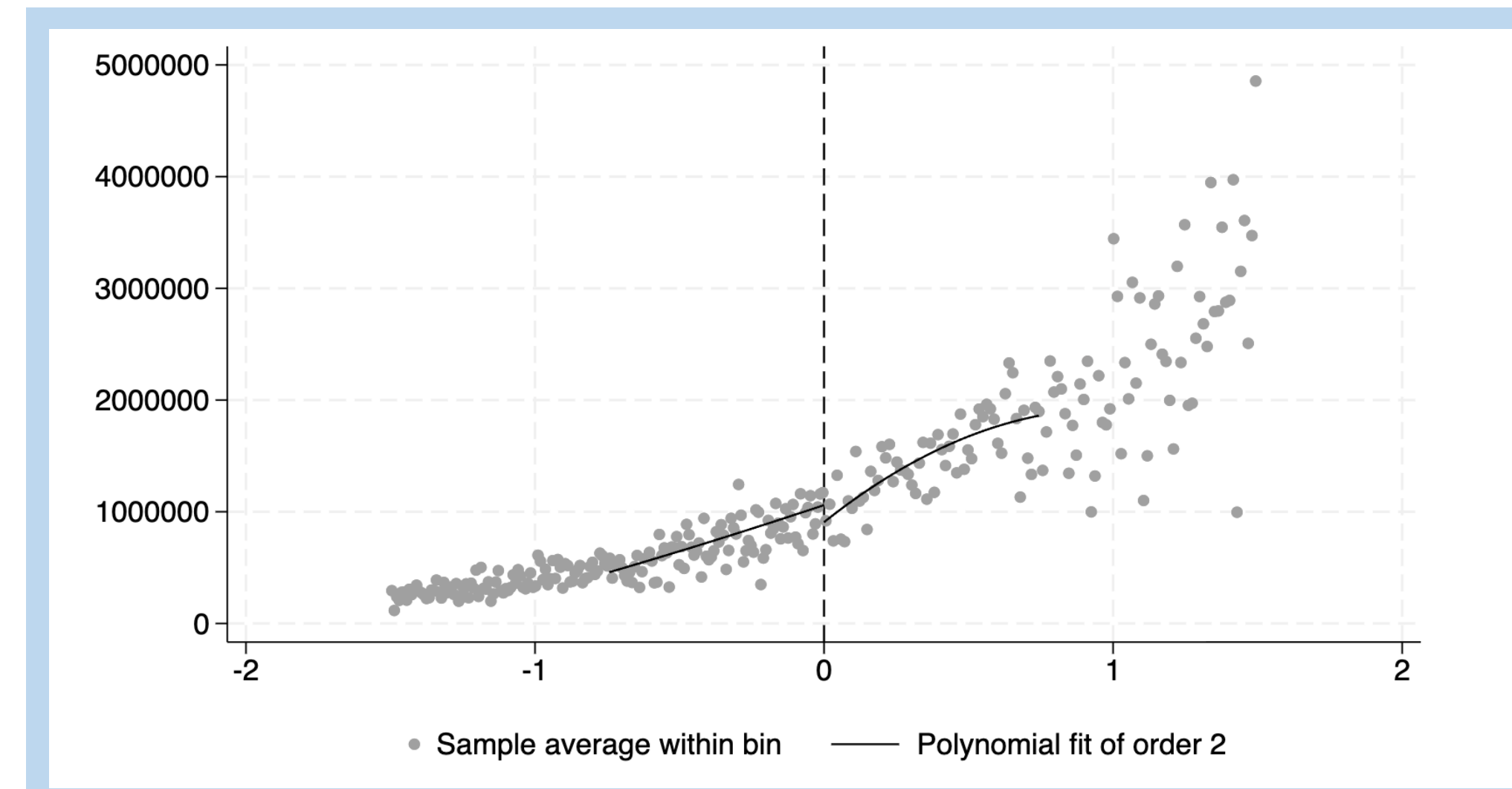


- The regression discontinuity plot shows a clear gap in the likelihood of using open bidding method at the cutoff point of the running variable, confirming the effectiveness of the policy and supports that reaching the legal threshold largely increases the possibility of using open bidding by about 6% when closely look at contracts whose amounts are close to the legal thresholds (both below and above).
- Four different methods of selecting bandwidth are conducted for best effect and robustness check. On average, reaching legal threshold increases the possibility of using open bidding method by 4.7%.

Second Stage Results

- We use product unit price as the main indicator for corruption with the assumption that open bidding reduce corruption thus price.
- This second stage second RD plot reveals significant negative jump at the cutoff point, suggesting exceeding the legal threshold results decrease product prices in contracts with amounts just below and just above the legal thresholds.
- To examine the heterogeneity effect across different sample, we also explored sample restriction based on buyer group (Fig. 3), product type (Fig. 4), area, price level (Fig. 6). These negative jump across different samples further confirm the effect of open bidding in reducing corruption by reducing price.

Figure 2. RD plot between log value of Distance and unit price on entire sample



- Beside unit price as procurement proxy, we also use fulfillment period, and personal connect as extra proxy. For example, personal connect is defined when the frequency of the combination of certain buyer and supplier within one year is more than one. Fig. 7 shows a positive jump at the cutoff point. While this goes against the anticipated deterrent effect of mandatory open bidding, the result suggests that stricter regulation may unintentionally drive procurement officers to rely more on familiar suppliers. This also highlights the need for further investigation and how anti-corruption policies can trigger adaptive, strategic behavior.

Figure 3. RD plot between log value of Distance and unit price when procurement buyer is Regulatory Authority

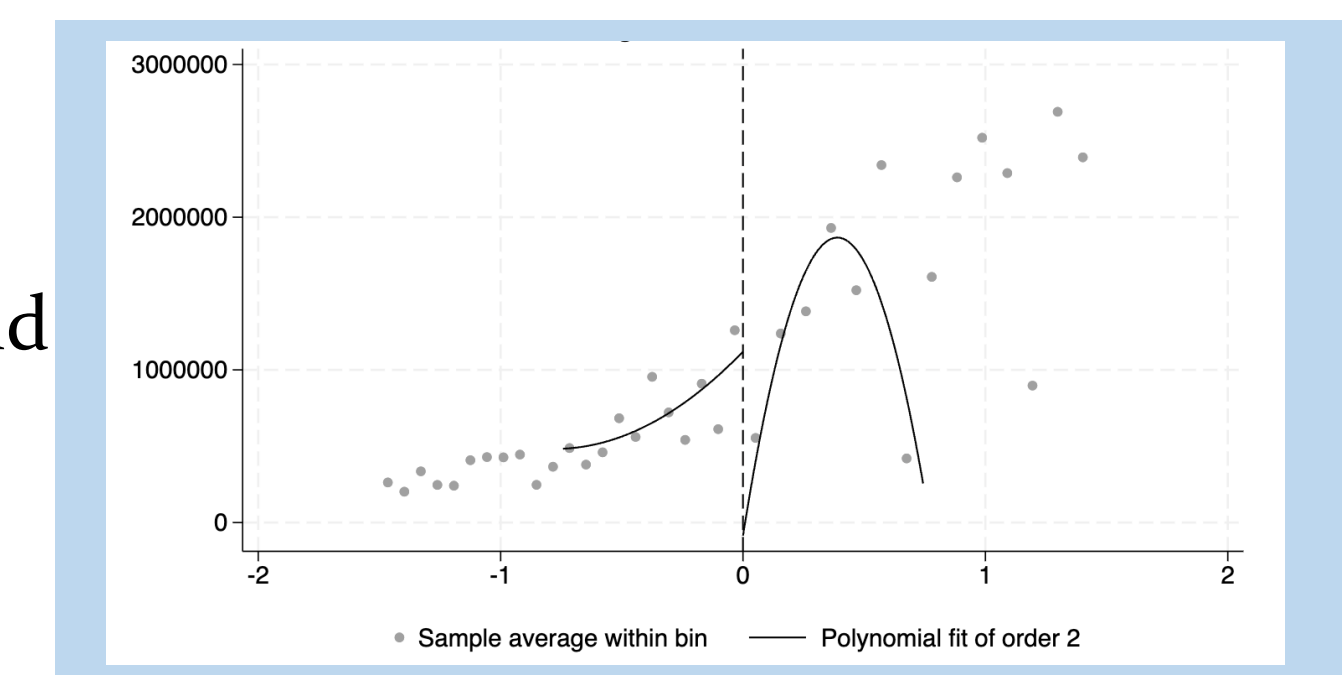


Figure 4. RD plot between log value of Distance and unit price for non-product contract

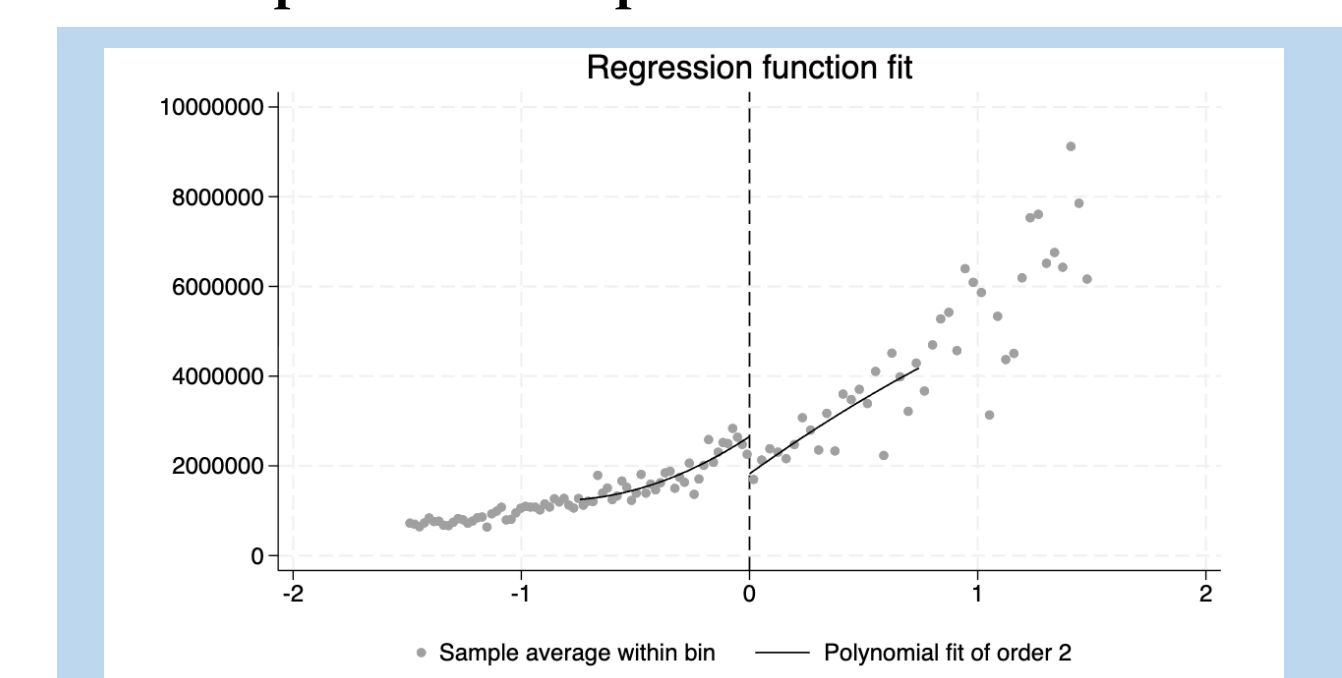


Figure 6. RD plot between log value of Distance and unit price when product is low price product

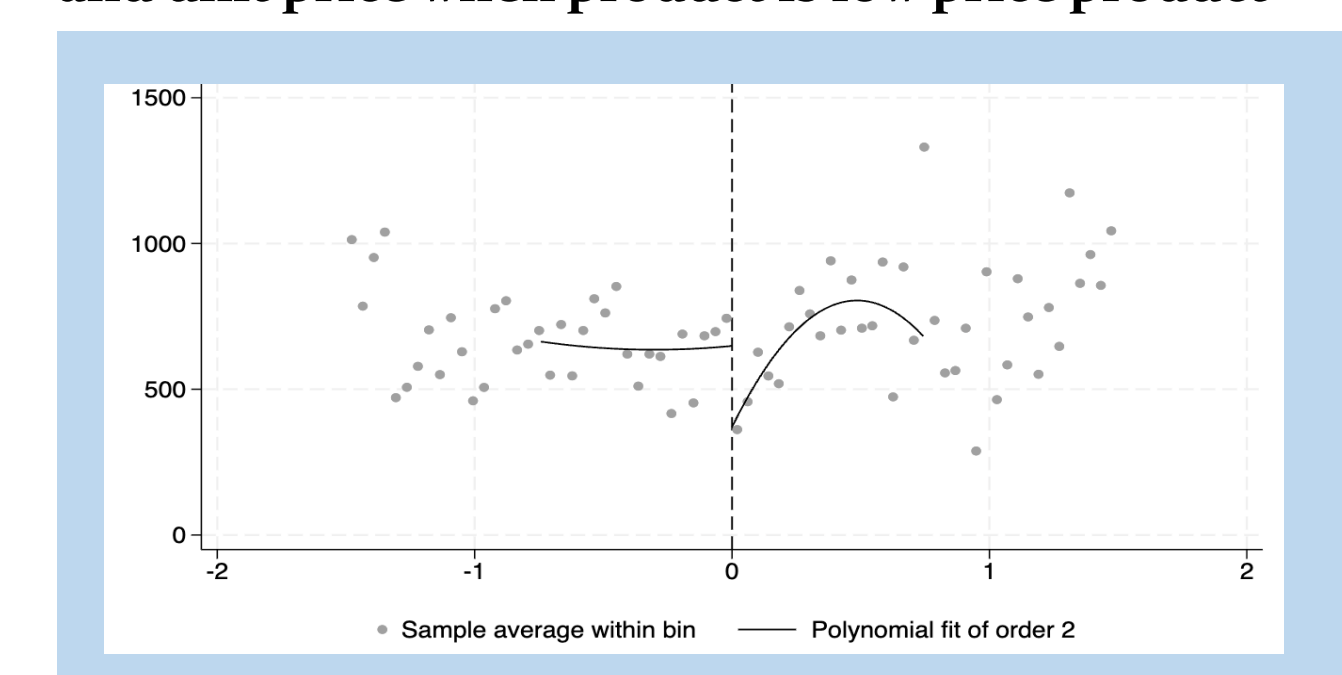
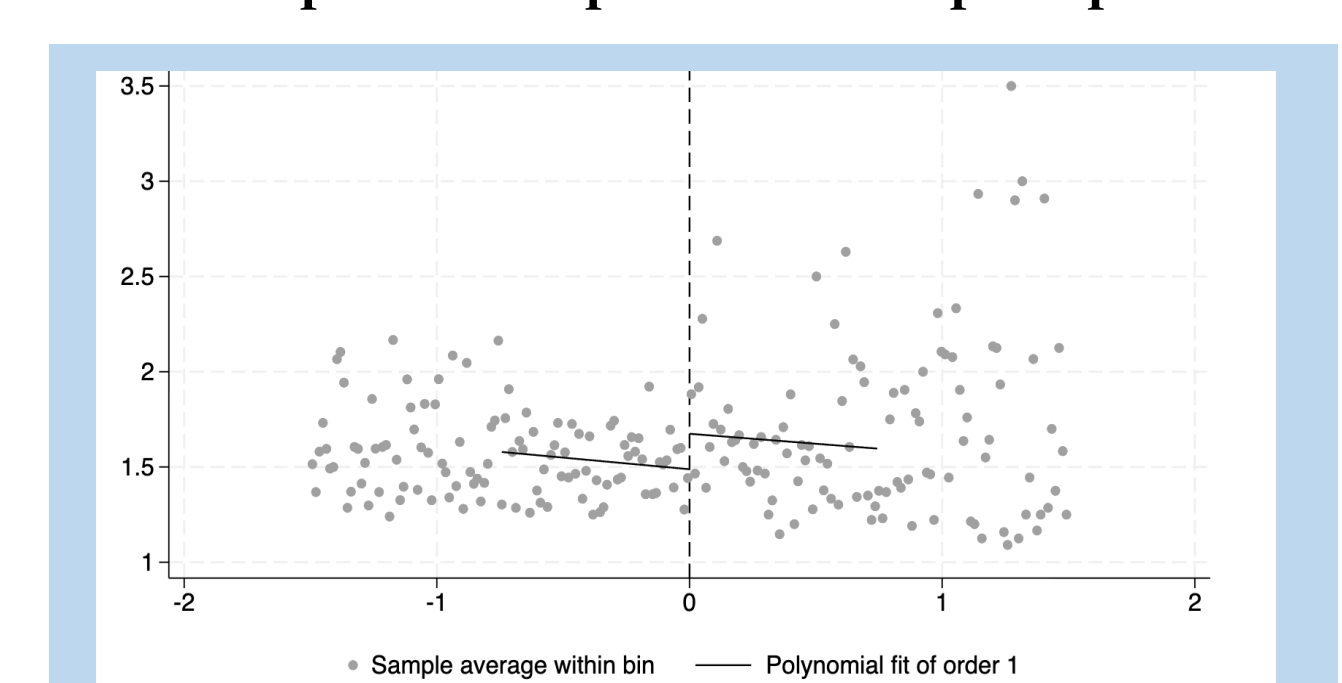


Figure 7. RD plot between log value of Distance and unit price when product is low price product



Future Research

- There is an upward trend in price above the threshold across all RD plots. The validity of the regression discontinuity (RD) design relies on the assumption that observations just above and below the threshold are comparable. Future work will refine sample restrictions to minimize potential heterogeneity in contract types, which may otherwise confound the treatment effect estimation.
- Our findings suggest that the impact of open bidding varies significantly across different subsamples (e.g., by product category, region, or buyer type). Further analysis is needed to uncover the mechanisms behind these heterogeneous effects, and whether they reflect real differences in corruption incentives or are driven by sample composition.
- To better triangulate the impact of procurement transparency, future work will incorporate additional proxies for corruption, such as fulfillment period, relational contracting patterns, or contract modifications, to evaluate the robustness of observed patterns from multiple behavioral dimensions.