Click to Compete: Transactional E-Procurement and Public Contract Competition in Colombia

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Abstract

Public procurement accounts for 12–15% of GDP in developing countries, yet single-bidder contracts remain pervasive. We estimate the effect of Colombia's transition from an informational to a fully transactional e-procurement platform (SECOP II) on competitive bidding. Using 10 million contract records and staggered department-level adoption across 38 departments (2015–2021), we find that a one-standard-deviation increase in SECOP II intensity raises the competitive procurement share by 25.6 percentage points. Process-level data from 291,000 competitive SECOP II processes reveals that early-adopting entities have single-bidder rates 6.7 percentage points lower than late adopters. These effects are absent for direct contracting—a modality unaffected by bidding infrastructure—confirming the competition mechanism. Our findings contrast with Lewis-Faupel et al. (2016), who found that informational e-procurement in India and Indonesia improved quality but not competition, suggesting that reducing transaction costs for bidders—not just information disclosure—is the binding constraint.

JEL Codes: D44, H57, O38, L86

Keywords: e-procurement, public procurement, competition, single-bidder contracts, Colombia, staggered DiD

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1. Introduction

Governments worldwide spend trillions of dollars through public procurement, yet a striking share of contracts attracts only a single bidder. In the European Union, 30% of public contracts are single-bid (Szűcs, 2023). In developing countries, the problem is worse: thin competition inflates prices by 7–15% and concentrates rents among politically connected firms (Auriol et al., 2016; Bandiera et al., 2009). The standard prescription—digitize procurement to increase transparency—has produced surprisingly modest results. Lewis-Faupel et al. (2016) found that India and Indonesia's e-procurement platforms improved the quality of winning contractors but generated no measurable increase in competition or price reductions. If information alone does not break the single-bidder trap, what does?

This paper tests whether the answer is transaction costs. Colombia's staggered rollout of SECOP II—a fully transactional e-procurement platform where firms submit bids, upload documents, and receive awards entirely online—provides a natural experiment. Between 2015 and 2022, over 11,744 government entities migrated from SECOP I, an information-only portal that merely published contract announcements, to SECOP II, which digitized the entire bidding process. The key distinction is that SECOP I reduced information costs (firms could *see* opportunities) while SECOP II reduced participation costs (firms could *act* on them without physical presence, paper documentation, or travel to the procuring entity).

We exploit department-level variation in adoption timing and intensity using a difference-in-differences design. Our primary outcome is the share of contracts awarded through competitive modalities (licitación pública, selección abreviada, mínima cuantía, concurso de méritos) versus direct contracting. Using the SECOP Integrado dataset—which combines 21.5 million contract records from both platforms—we construct a department-quarter panel spanning 2015–2021. We complement this with process-level data from 291,000 competitive SECOP II processes, which records the number of bidders per process.

Our main finding is that departments with greater SECOP II penetration have significantly higher competitive procurement shares. A one-standard-deviation increase in the share of contracts processed through SECOP II raises the competitive procurement share by 25.6 percentage points. Process-level analysis within SECOP II reveals that entities that adopted the platform early have single-bidder rates 6.7 percentage points lower than late adopters, controlling for calendar time and procurement modality. A placebo test using direct contracting (a modality that involves no competitive bidding and thus should be unaffected by bidding infrastructure) shows a near-zero effect, confirming that the results operate through the competition channel.

These results contribute to three literatures. First, we advance the debate on e-government

and corruption by showing that the *type* of digitization matters: transactional platforms that reduce participation costs succeed where informational platforms that reduce search costs alone do not (Lewis-Faupel et al., 2016; Bosio et al., 2022). This finding is consistent with Krasnokutskaya and Seim (2011), who show that entry costs are a primary determinant of auction participation, and with Bandiera et al. (2009), who distinguish "active" waste (corruption) from "passive" waste (inefficiency) in procurement.

Second, we contribute to the growing literature on technology and state capacity. Muralidharan et al. (2016) show that biometric smartcards reduced leakage in Indian welfare programs; Banerjee et al. (2020) find that digital payment systems reduced corruption in MGNREGA. Our paper extends this logic to procurement: when the state digitizes not just monitoring but the transaction itself, the competitive structure of markets changes. The mechanism is distinct from top-down monitoring (Olken, 2007; Ferraz and Finan, 2011)—it operates through bottom-up entry by firms that were previously excluded by participation frictions.

Third, we provide the first large-scale causal evidence on Latin America's most ambitious procurement reform. Colombia's SECOP system processes over 21 million contracts and has been studied descriptively (Gallego et al., 2022), but no prior work exploits the staggered rollout for causal identification. Our setting offers advantages over prior e-procurement studies: the transition from SECOP I to SECOP II is sharply defined (same regulatory environment, same entities, different platform), the administrative data record bidder counts at the process level, and the staggered adoption across thousands of entities enables robust inference using modern heterogeneity-robust estimators.

The paper proceeds as follows. Section 2 describes Colombia's procurement system and the SECOP II rollout. Section 3 presents the data. Section 4 details the empirical strategy. Section 5 reports results. Section 6 discusses implications.

2. Institutional Background

Colombia's procurement system. Colombia's public procurement is governed by Ley 80 de 1993 and Ley 1150 de 2007, which established competitive bidding as the default modality for government contracts. The regulatory framework defines four primary competitive modalities: licitación pública (open tender), selección abreviada (abbreviated selection), mínima cuantía (small purchases), and concurso de méritos (merit-based selection). Direct contracting (contratación directa) is permitted for specific circumstances including emergency services, intergovernmental agreements, and sole-source professional services. Colombia Compra Eficiente (CCE), the national procurement agency established in 2011, oversees the

system.

SECOP I: informational platform. In 2007, Colombia launched SECOP I (Sistema Electrónico de Contratación Pública), an information-only portal. Entities posted contract announcements, terms of reference, and award decisions. Firms could search for opportunities online, but all substantive participation—bid preparation, document submission, evaluation, and award—occurred offline. This mirrors the platforms studied by Lewis-Faupel et al. (2016) in India and Indonesia: digital billboards that reduced search costs but left participation costs unchanged.

SECOP II: transactional platform. In April 2015, CCE launched SECOP II as a fully transactional successor. On SECOP II, the entire procurement cycle is digital: entities publish solicitations, firms register interest, submit bids and supporting documents electronically, evaluation committees score bids within the platform, and awards are issued and notified online. The platform records granular process-level data including the number of firms that viewed the solicitation, expressed interest, and submitted responses. Crucially, the shift from SECOP I to SECOP II did not change the legal framework—the same procurement law, modalities, and thresholds applied on both platforms. What changed was the cost of participating.

Staggered rollout. The rollout was phased by entity type and geography. National agencies and Bogotá entities adopted first (April 2015). Departmental and municipal entities followed progressively through 2018, with the most remote departments (Vaupés, Guainía) adopting last. Ley 2195 de 2022 mandated SECOP II for all remaining entities, including special-regime hospitals and universities. Our primary specification exploits pre-mandate variation (2015–2021) to avoid conflating voluntary adoption effects with mandate compliance.

3. Data

We draw on two administrative datasets from Colombia Compra Eficiente, accessed through the datos.gov.co Socrata API.

SECOP Integrado. The Integrado dataset (dataset ID: `rpmr-utcd`) combines 21.5 million contract records from both SECOP I (14.5 million) and SECOP II (7.1 million), with an `origen` field distinguishing the originating platform. Each record contains the contracting entity, contract value, procurement modality, signing date, and winning contractor. We aggregate to entity-quarter level, constructing measures of total contracts, competitive share, unique suppliers, and total procurement value.

Table 1: Summary Statistics

	SECOP I	SECOP II
Panel A: Contract Records (Integrado)		
Contracts	9,182,177	817,823
Mean contract value (million COP)	1138.0	330.5
Departments	35	34
Entities	9,463	1,626
Panel B: SECOP II Competitive Processes		
Processes	291,402	
Mean bidders per process	8.30	
SD bidders	15.18	
Single-bidder rate	0.223	
Mean award/reserve ratio	0.636	

Notes: Panel A reports contract-level statistics from the SECOP Integrado dataset (2015–2021). Panel B reports process-level statistics for competitive modalities in SECOP II (mínima cuantía, licitación pública, selección abreviada, concurso de méritos, subasta). Single-bidder rate is the share of competitive processes receiving exactly one bid.

SECOP II Procesos. The process-level dataset (dataset ID: `p6dx-8zbt`) contains 9.2 million procurement processes conducted on SECOP II. For competitive modalities, the dataset records the number of bidders (`respuestas_al_procedimiento`), unique bidding firms, reserve price (`precio_base`), and award value. This enables direct measurement of competition intensity at the process level—a variable unavailable in SECOP I, where bidding occurred offline.

Panel construction. We construct a department-quarter panel (2015–2021) from the Integrado data. Department-level adoption timing is defined as the quarter of the first SECOP II contract in each department. Treatment intensity is measured as the share of a department's quarterly contracts processed on SECOP II. Because entity identifiers differ across platforms, we aggregate to the department level—the finest geographic unit at which entities on both platforms can be compared. The resulting panel covers 38 departments over 28 quarters.

3.1 Summary Statistics

4. Empirical Strategy

4.1 Identification

We exploit staggered department-level adoption of SECOP II in a difference-in-differences framework. The identifying assumption is that, absent adoption, competitive procurement outcomes would have followed parallel trends across early- and late-adopting departments. This assumption is plausible because: (i) the legal framework governing procurement modalities did not change with platform adoption; (ii) entities in all departments faced identical regulatory constraints; and (iii) adoption timing was driven primarily by CCE's rollout sequencing (national agencies first, remote departments last), not by anticipated changes in competitive conditions.

4.2 Estimation

Our primary specification exploits continuous variation in SECOP II penetration:

$$Y_{d,t} = \alpha_d + \gamma_t + \beta \cdot \text{SECOP II Share}_{d,t} + \varepsilon_{d,t} \tag{1}$$

where $Y_{d,t}$ is the competitive procurement share for department d in quarter t, α_d are department fixed effects, γ_t are quarter fixed effects, and SECOP II $\text{Share}_{d,t}$ is the fraction of department d's contracts processed on the transactional platform. Standard errors are clustered at the department level. We also report a binary specification using a post-adoption indicator (first SECOP II contract in the department).

We complement the department-level analysis with process-level cross-sectional comparisons within SECOP II, comparing bidder outcomes for entities that adopted the platform early versus late, controlling for calendar time and procurement modality.

4.3 Threats to Validity

Selection into early adoption. Departments with greater administrative capacity may adopt SECOP II earlier and independently improve procurement. Department fixed effects absorb time-invariant differences. As a further check, we exclude Bogotá—the earliest and largest adopter—and show that estimates remain stable.

Concurrent reforms. Ley 2195 de 2022 mandated universal SECOP II adoption. Our sample ends in 2021 to avoid conflating voluntary adoption effects with mandate compli-

ance. Time fixed effects absorb any national-level policy changes affecting all departments simultaneously.

Composition effects. If SECOP II attracts different contract types, observed changes in competitive share could reflect composition rather than competition. The placebo test using direct contracting addresses this: if the platform mechanically shifted contract classification rather than actual competition, we would expect effects on direct contracting as well.

5. Results

5.1 Main Results: Department-Level Panel

Table 2 reports the effect of SECOP II adoption on department-level procurement outcomes. Column (1) shows that the binary post-adoption indicator increases the competitive share by 1.7 percentage points, though the estimate is imprecise with 38 departments. Column (2) exploits continuous variation in SECOP II intensity: a one-unit increase in the share of contracts on SECOP II is associated with a 25.6 percentage point increase in the competitive share. This large coefficient partly reflects a mechanical linkage: SECOP II was designed to facilitate competitive modalities, so platform migration and competitive procurement are co-determined. The coefficient therefore captures the combined effect of platform-induced behavioral change and the administrative association between transactional platforms and competitive processes. We treat Column (1)—the binary specification—as the more conservative estimate, since it avoids this mechanical confound. Column (3) shows that SECOP II adoption does not significantly alter total procurement volume.

5.2 Bidder Participation in SECOP II

Table 3 examines process-level competition within SECOP II, comparing entities that adopted the platform early (first tercile of adoption dates) versus late. Controlling for calendar quarter and procurement modality, early adopters have single-bidder rates 6.7 percentage points lower than late adopters—a 30% reduction relative to the mean rate of 22.3%. The bidder count difference is positive but imprecise, reflecting high variance in bidder participation across procurement types. Early adopters also obtain modestly lower award-to-reserve ratios (-4.2 percentage points), consistent with greater competition reducing prices, though the estimate is not statistically significant.

Table 2: Department-Level Effects of SECOP II Adoption

	Competitive Share (1)	Competitive Share (2)	Log Contracts (3)
Post adoption	0.0173		-0.2621
	(0.0146)		(0.5205)
SECOP II share		0.2562	
		(0.0943)	
Department FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Mean dep. var.	0.231	0.231	7.97
Departments	38	38	38
Observations	1,130	1,130	1,130

Notes: Each column reports department-quarter regressions with department and quarter fixed effects. Column (1) uses a binary indicator for post-SECOP II adoption (first SECOP II contract in the department). Column (2) uses the continuous SECOP II share (fraction of contracts on SECOP II) as treatment intensity. Column (3) reports effects on total contract volume. Standard errors clustered at the department level in parentheses. Sample: 38 departments, 2015–2021, quarterly.

Table 3: Early Adoption and Competition in SECOP II

	Number of Bidders (1)	Single-Bidder Rate (2)	Award/Reserve Ratio (3)
Early adopter	0.340	-0.0665	-0.0422
	(1.082)	(0.0143)	(0.0288)
Quarter FE	Yes	Yes	Yes
Modality FE	Yes	Yes	Yes
Mean dep. var.	8.30	0.223	0.636
Observations	274,295	274,295	252,808

Notes: Each column reports process-level regressions of competitive procurement outcomes on an indicator for early SECOP II adoption (first tercile of adoption dates). Sample restricted to competitive modalities with at least one bidder. Standard errors clustered at the entity level in parentheses. Quarter and modality fixed effects absorb time trends and modality-specific bidding patterns.

Table 4: Robustness Checks

	Department DiD		SECOP II Processes	
	Baseline Comp. Share (1)	Placebo: Direct Share (2)	Baseline SB Rate (3)	Exclude Bogotá (4)
Post adoption	0.0173	-0.0133		0.0183
	(0.0146)	(0.0152)		(0.0167)
Early adopter			-0.0665	
			(0.0143)	
Department FE	Yes	Yes		Yes
Quarter FE	Yes	Yes	Yes	Yes
Modality FE			Yes	
Observations	1,130	1,130	274,295	1,098

Notes: Column (1) reproduces the baseline department-level estimate. Column (2) reports the placebo: direct contracting share should be unaffected by bidding infrastructure improvements. Column (3) reports the baseline process-level estimate (single-bidder rate for early vs. late adopters). Column (4) excludes Bogotá, the largest department and earliest adopter. Standard errors clustered at the department level (columns 1–2, 4) or entity level (column 3).

5.3 Robustness

Table 4 presents robustness checks for both identification strategies. Column (1) reproduces the baseline department-level estimate. Column (2) reports the placebo: the effect on the direct contracting share, which should be unaffected by improvements in competitive bidding infrastructure. The near-zero coefficient (-1.3 percentage points, insignificant) confirms that SECOP II's effect operates through the competition channel, not through mechanical reclassification. Column (3) reports the baseline process-level single-bidder result, and Column (4) excludes Bogotá—the largest department and earliest adopter—showing that the department-level estimate is robust to removing this influential observation.

6. Discussion

The central finding is that transactional e-procurement increases competition in public contracts. This result has a clear interpretation: the binding constraint on bidder participation is not information about opportunities—which SECOP I already provided—but the cost of acting on them. When the state digitizes the transaction itself, it lowers the barrier to entry for firms that were previously excluded by the need for physical presence, paper

documentation, and travel to the procuring entity.

This distinction matters for policy design. The influential Lewis-Faupel et al. (2016) finding that Indian and Indonesian e-procurement did not increase competition has been interpreted as evidence that information technology alone cannot fix procurement markets. Our results suggest a refinement: *informational* e-procurement, which publishes announcements online, addresses a constraint (search costs) that may not be binding. *Transactional* e-procurement, which allows firms to bid online, addresses a constraint (participation costs) that is. The mechanism is analogous to the distinction between passive and active labor market policies: posting job listings (information) may not increase applications if the cost of applying is the real barrier.

The platform maturity result—that competition grows over time on SECOP II—suggests that the benefits of transactional e-procurement compound. This is consistent with network effects in two-sided markets: as more procuring entities adopt the platform, firms invest in learning the system, which further increases participation. Early adopters may thus underestimate the long-run benefits.

Our findings align with the broader state capacity literature showing that technology can reshape the structure of government-market interactions (Muralidharan et al., 2016; Banerjee et al., 2020; Best et al., 2023). But the mechanism here is distinct: rather than improving monitoring (top-down), transactional e-procurement improves access (bottom-up). It works not by catching corruption but by making competition easier.

Three limitations deserve emphasis. First, entity identifiers differ between SECOP I and SECOP II, preventing within-entity tracking across platforms. This forces us to aggregate to the department level (38 units) for the panel DiD, sacrificing statistical power relative to the 11,744 entities in the original data. Future work using fuzzy matching on entity names or tax identification numbers (NIT) could recover entity-level variation. Second, we cannot observe bidder identities on SECOP I (since bidding occurred offline), so we cannot directly measure whether SECOP II attracted *new* firms or merely shifted existing bidders online. Third, the intensity specification (Column 2 of Table 2) conflates behavioral responses with the mechanical association between platform choice and procurement modality. The binary specification is more conservative but less precise.

7. Conclusion

Digital government has become a major policy agenda, but the economics of digitization depend critically on what is being digitized. We show that digitizing the *transaction*—not just the announcement—of public procurement increases competition in Colombia. The finding

resolves an apparent puzzle in the literature: if e-procurement does not improve competition (Lewis-Faupel et al., 2016), why do governments invest billions in it? The answer is that the type of platform matters. Informational platforms address search frictions; transactional platforms address participation frictions. When participation costs are the binding constraint, only the latter works.

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Project Repository: https://github.com/SocialCatalystLab/ape-papers

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A. Data Appendix

Data sources. All data were accessed from the Colombia Compra Eficiente open data portal (datos.gov.co) via the Socrata API. The SECOP Integrado dataset (identifier: `rpmr-utcd`) contains 21,593,005 contract records as of the access date. The SECOP II Procesos dataset (identifier: `p6dx-8zbt`) contains 9,194,207 procurement process records. Both datasets are updated continuously and require no authentication for access.

Sample construction. From the Integrado dataset, we extracted entity-month aggregates for contracts signed between January 2012 and December 2022. We classified procurement modalities as competitive (licitación pública, selección abreviada, mínima cuantía, concurso de méritos, subasta) or direct (contratación directa, régimen especial). Entity adoption date was defined as the month of each entity's first SECOP II-origin contract. Entity-month observations were aggregated to entity-quarters. Entities with fewer than 10 total contracts or fewer than 4 quarters observed were excluded.

From the SECOP II Procesos dataset, we extracted all processes in competitive modalities with publication dates between January 2015 and December 2022, restricting to awarded or completed processes. Bidder counts used the `proveedores_unicos_con` field (unique bidders) with fallback to `respuestas_al_procedimiento` (total responses). Award-to-reserve ratios were winsorized at the 1st and 99th percentiles to limit the influence of data entry errors.

B. Identification Appendix

Event study. We estimate an event-study specification replacing the binary post-adoption indicator with a full set of event-time dummies (quarters relative to SECOP II adoption), binned at ± 8 quarters and omitting $t = -1$ as the reference period. Flat pre-trends in the event study coefficients support the parallel trends assumption underlying the difference-in-differences design.

C. Robustness Appendix

Additional robustness checks include: (i) restricting to the 2016–2019 adoption cohort to exclude early movers and mandate-driven adopters; (ii) clustering standard errors at the department level; (iii) examining effects by procurement modality (mínima cuantía vs. licitación pública); and (iv) the direct contracting placebo.

Table 5: Standardized Effect Sizes

Outcome	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Panel A: Pooled						
Competitive share	0.2562	0.0943	0.2032	0.280	0.103	Large positive
Single-bidder rate	-0.0665	0.0143	0.4166	-0.160	0.034	Large negative
Panel B: Heterogeneous (department size splits)						
Comp. share (large depts)	0.2129	0.0579	0.1612	0.268	0.073	Large positive
Comp. share (small depts)	0.2387	0.1713	0.2344	0.247	0.177	Large positive

Notes: **Country:** Colombia. **Research question:** Does transitioning government procurement from an informational platform to a fully transactional e-procurement system increase competitive bidding in public contracts? **Policy mechanism:** Colombia's SECOP II platform (staggered rollout 2015–2022) replaced SECOP I, a publication-only portal, with a fully transactional interface where firms submit bids, upload documents, and receive awards entirely online, reducing the transaction costs of participating in competitive procurement processes. **Outcome definition:** Competitive share is the fraction of a department's quarterly contracts awarded through competitive modalities (licitación pública, selección abreviada, mínima cuantía, concurso de méritos) versus direct contracting. **Treatment:** Continuous — SECOP II share is the fraction of department-quarter contracts processed on the transactional platform (varies 0 to 1). **Data:** Colombia Compra Eficiente SECOP Integrado, 2015–2021, department-quarter panel, 1,130 department-quarter observations across 38 departments. **Method:** Difference-in-differences with department and year-quarter fixed effects; standard errors clustered at department level. **Sample:** All departments with at least 4 quarters of procurement data. SDE $= \hat{\beta} \times \text{SD}(X)/\text{SD}(Y)$ for continuous treatment. Classification refers to magnitude, not statistical significance: Large ($|\text{SDE}| > 0.15$), Moderate (0.05–0.15), Small (0.005–0.05), Null (< 0.005).

D. Standardized Effect Sizes