

One size fits all? Procedural competition and contracting outcomes in digital public procurement in Italy

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Journal of Public
Procurement

Received 18 December 2025

Revised 24 March 2026

3 May 2026

Accepted 13 May 2026

Abstract

Purpose – Public procurement plays a central role in public governance by structuring market access, organizing administrative discretion and supporting accountability through procedural rules. Despite the growing adoption of digital procurement platforms, empirical evidence remains limited on how digital reforms are associated with competitive dynamics and institutional authority beyond technical efficiency gains. This study aims to examine how procedural design within a mandatory digital procurement system relates to contracting outcomes.

Design/methodology/approach – The study analyzes comprehensive administrative microdata on all procurement procedures conducted in 2024 on the Italian Mercato Elettronico della Pubblica Amministrazione, managed by CONSIP S.p.A. This period corresponds to the first full year of implementation of the new Italian Procurement Code (Legislative Decree No. 36 / 2023). Using multivariate count-data models and instrumental-variable estimations, the analysis compares competitive, rule-based Request for Offer with discretionary direct negotiations and examines how supplier participation interacts with procedural design.

Findings – The results indicate that competitive digital procurement procedures are associated with a higher number of contracts awarded. Moreover, the association between supplier participation and contracting outcomes is stronger under competitive procedures, while participation alone is less strongly associated with outcomes under discretionary formats. Overall, the findings suggest that contracting patterns differ systematically across procedural formats, particularly when competition is embedded within standardized procedural rules.

Research limitations/implications – The analysis is restricted to a single year and relies on cross-sectional data, which limits the ability to examine dynamic changes over time or establish causal relationships.

Social implications – The findings suggest that policymakers should complement digital procurement reforms with investments in administrative capacity, standardized procedures and oversight to better support governance outcomes.

Originality/value – This study contributes to the public procurement literature by providing large-scale empirical evidence on how procedural design within digital procurement platforms is associated with differences in contracting outcomes and administrative organization. By focusing on institutional rules rather than price efficiency alone, it highlights digital procurement as a governance framework associated with the organization of discretion and market access.

Keywords Public procurement, Efficiency, Public administration, Cross-sectional data

Paper type Conceptual paper

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JEL classification – C1, D73, H57, O33

Interests declaration: The author declares that there are no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.



Journal of Public Procurement
Emerald Publishing Limited
1535-0118
DOI 10.1108/JOPP-12-2025-0162

1. Introduction

Public procurement is a key instrument of governance, representing a significant share of national expenditure and shaping how governments allocate resources, enhance efficiency and create public value. In OECD countries, public procurement typically accounts for 12% to 20% of GDP, whereas in Italy it approaches one-quarter of total public spending (Caserta et al., 2025; OECD, 2025). Since procurement decisions directly influence the delivery of infrastructure, healthcare and social services, ensuring efficiency and integrity has become a central concern in public administration research (Patrucco et al., 2016; Chiappinelli, 2020; Bosio et al., 2022). In this context, efficiency extends beyond cost savings to include timeliness, quality, and institutions' ability to manage contracts transparently and competitively (Decarolis, 2014; Flynn, 2018; Edquist and Zabala-Iturriagoitia, 2020; Melnikov, 2022).

Recent studies emphasize that efficiency in public procurement depends on a careful balance among competition, institutional quality, and administrative capacity. In Italy, fragmented governance and uneven bureaucratic competence continue to impede performance, exacerbating regional disparities and diminishing the effectiveness of competitive mechanisms (Coviello et al., 2018a, 2018b; Chiappinelli, 2020; Melnikov, 2022). Caserta et al. (2025) show that institutional quality plays a crucial mediating role in the relationship between procurement characteristics, such as contract size and the expertise of contracting authorities and efficiency outcomes. Generally, larger and more experienced authorities operate more efficiently, whereas smaller authorities often face capacity constraints, leading to increased delays and cost overruns. These findings align with longstanding debates in the public administration literature on striking an optimal balance among centralization, professionalism, and accountability in managing public spending.

Over the past two decades, procurement systems have undergone significant digital transformation. E-procurement platforms have transformed how governments interact with markets by introducing standardization, traceability and transparency in public procurement (Özbilgin and Imamoğlu, 2011; Albano et al., 2015). Electronic marketplaces and dynamic purchasing systems have reduced barriers to entry, fostered competition and enabled ongoing supplier participation. As a result, digital tools are now viewed as catalysts for efficiency and inclusiveness, particularly benefiting small- and medium-sized enterprises (SMEs) (Tammi et al., 2020). Additionally, the shift toward digitalization signifies broader governance reform, embedding transparency, auditability and procedural accountability within the state's institutional framework (Uyarra et al., 2020; Decarolis et al., 2025).

In Italy, CONSIP S.p.A., the governmental purchasing body, has played a crucial role in modernizing public procurement through the *Mercato Elettronico della Pubblica Amministrazione* (MePa). The MePa serves as a unified marketplace, enabling public administrations to procure goods and services through standardized electronic procedures. The recent Legislative Decree No. 36 / 2023 (*New Public Procurement Code*) marks a significant advancement in this process by mandating the use of the national e-procurement portal, MePa, for most public purchases. This requirement establishes digitalization as a legal obligation. The reform aims to standardize procedures, enhance transparency and promote efficiency through interoperability and real-time traceability. By reducing discretion and ensuring open competition, the new code aligns the Italian procurement framework with European standards for digital governance and public integrity.

Although recent advances have been made, significant challenges remain, including institutional inefficiencies and corruption. Recent research shows that governance weaknesses, collusive behavior and organized crime consistently distort competition and undermine procurement outcomes (Adinolfi et al., 2011; Fazekas and Kocsis, 2020; Gnaldi

and Del Sarto, 2024; Fontana and D'Agostino, 2024; Millemaci and Patti, 2025). Fontana and D'Agostino (2024) reveal that local administrations in areas affected by mafia activity deliberately manipulate contract values to circumvent anti-mafia screening. This illustrates how institutional fragility allows corruption to thrive even within regulated systems. These findings support the argument that technological tools alone cannot ensure efficiency or integrity; they must be integrated into robust institutional frameworks capable of enforcement and oversight at both the local and national levels. Consequently, procurement is viewed not merely as a technical or economic process but as a governance domain in which institutional design, legal reliability, transparency, and ethical safeguards collectively shape performance.

Despite the growing body of research on auction design, institutional quality and digital governance, empirical evidence remains fragmented and inconsistent regarding how e-procurement functions and promotes competition (Decarolis, 2014; Coviello *et al.*, 2018a, 2018b), administrative capacity (Chiappinelli, 2020; Caserta *et al.*, 2025) and the fairness of administrative procedures related to negotiations between economic entities (Özbilgin and İmamoğlu, 2011; Albano *et al.*, 2015).

Limited research has examined how competitive dynamics develop in digital procurement ecosystems, particularly in areas with administrative fragmentation and varying levels of institutional quality. This paper aims to fill that gap by providing the first large-scale empirical analysis of the Italian digital public procurement system, using unique administrative microdata from CONSIP.

The data set of the present study comprises all purchasing procurement procedures (hereafter “procedures”) conducted by public administrations (P.A.) on the MePa in 2024, the first full year following the implementation of the Italian Law Decree No. 36 / 2023. In this study, the term “procedure” refers to a single tendering event conducted on the MePa platform, which constitutes the unit of analysis and may result in one or more contracts. By leveraging this undisclosed data, the study investigates how the design of procurement procedures, the comparison between the competitive “Request for Offer” (*RdO*) (*Richiesta di Offerta*) and the non-competitive “Direct Negotiation” (*Trattativa Diretta*), and supplier participation are related to procurement performance across the Italian PAs.

This study contributes to the literature in three main ways. First, rather than examining competition as a standalone factor, it conceptualizes procurement procedures as institutional mechanisms that structure how competition operates within digital platforms. In doing so, it shifts the focus from the level of competition to its procedural organization.

Second, the analysis provides novel evidence on how procedural design and supplier participation jointly relate to contracting outcomes at the level of individual procurement procedures. By focusing on contract allocation within procedures, the study moves beyond traditional measures such as prices or participation rates. It highlights how procurement rules shape the distribution of contracts across suppliers.

Third, the paper contributes empirically by exploiting administrative microdata from the Italian MePa platform for the first full year of the implementation of the Law Decree No. 36/2023. This setting enables the examination of procurement behavior in a fully digital, standardized environment, offering insights into how procedural rules operate in practice within contemporary e-procurement systems.

The empirical analysis yields three main insights. First, competitive procedures, such as the *RdO*, are associated with a higher number of contracts defined within each procurement procedure than noncompetitive procedures. Second, higher supplier participation is positively associated with contracting outcomes at the procedure level. Third, the association between supplier participation and contracting outcomes is stronger under *RdO*. Hence, these

results suggest that digital procurement is most closely linked to broader contract allocation when competition is embedded in standardized procedural frameworks (Caserta *et al.*, 2025; Özbilgin and Imamoğlu, 2011).

These empirical results have significant policy implications. The mandatory implementation of MePa under Law Decree No. 36 / 2023 offers an opportunity to improve transparency and accountability. However, its success depends on strengthening administrative capacity and ensuring consistent digital maturity across public authorities. It is essential to enhance training, standardization, and monitoring to translate digital reforms into measurable efficiency gains (Di Vita *et al.*, 2025). At the same time, the results should be interpreted with caution. While digitalization can promote openness, it cannot, by itself, prevent collusion or strategic behavior without robust institutional safeguards (Gnaldi and Del Sarto, 2024; Fontana and D'Agostino, 2024).

This study has several limitations. It relies on cross-sectional data from a single year, limiting our ability to observe dynamic effects or learning processes over time. Additionally, unobserved variation in administrative capacity or technology adoption may influence procurement outcomes. To address these issues, future research should consider longitudinal designs and comparative analyses to evaluate how digital procurement interacts with broader governance and sustainability objectives (Uyarra *et al.*, 2020).

The remainder of the paper is organized as follows: Section 2 reviews the literature; Section 3 outlines the data and methodology used; Section 4 presents the results and robustness checks; Section 5 discusses the main findings, while Section 6 concludes and discusses practical implications.

2. Literature review

2.1 Theoretical foundations: Competition and efficiency in public procurement

Public procurement is a core function of government and accounts for a substantial share of economic activity (Chiappinelli, 2020). The efficiency of procurement systems depends on several interrelated factors, including the intensity of competition, the design of purchasing procedures, and the integrity of the institutional environment in which contracts are awarded and enforced. In this respect, the economic theory of auctions provides a foundational framework for understanding how competition can enhance efficiency. Classical models suggest that competitive bidding reduces procurement costs by aligning suppliers' incentives with cost efficiency (Albano *et al.*, 2015; Decarolis, 2018). However, the relationship between competition and efficiency is not straightforward. Early theoretical and experimental studies show that, although first-price auctions can stimulate aggressive bidding, they may also generate adverse selection and moral hazard, ultimately undermining contractual performance after the award stage (Decarolis and Giorgiantonio, 2015).

Evidence from Italy confirms this tension. Decarolis (2014) shows that first-price auctions may produce lower bids but weaker contractual performance, while Coviello *et al.* (2018a, 2018b) demonstrate that poor judicial enforcement and broader institutional inefficiencies can distort contractors' incentives and reduce the expected gains from competition. These findings suggest that procurement efficiency depends not only on the existence of competition but also on the institutional conditions under which competition is organized and enforced. When bidders face uncertainty regarding enforcement mechanisms or when contracting authorities lack adequate monitoring capacity, the benefits of competition may be significantly weakened. Under such conditions, procurement processes may become more vulnerable to opportunistic behavior, cost overruns and declines in quality (Coviello *et al.*, 2018a, 2018b).

Although auction theory explains an important dimension of procurement performance, particularly the incentive effects of bidding, it does not fully account for why procedural design matters for administrative discretion, market openness, and the governance of relationships between public administrations and supplier markets. To address this broader dimension, this study also draws on resource dependence theory (RDT). From an RDT perspective, organizations depend on external actors for critical resources and therefore seek institutional arrangements that reduce uncertainty, manage vulnerability, and stabilize access to essential inputs. In public procurement, contracting authorities rely on supplier markets for goods, services, and implementation capacity, while suppliers rely on public administrations as a channel to access public demand. Procurement procedures should therefore be understood not merely as technical transaction mechanisms but as governance arrangements through which public organizations manage dependence on external providers. Competitive and standardized procedures such as *RdO* can thus be seen as institutional tools that reduce reliance on limited or bilateral supplier ties, expand access to external resources, and control competition through clear, rule-based interactions. From this view, procedural design is important not only because it influences bidding incentives but also because it shapes how public administrations manage market access and distribute contractual opportunities.

A supplementary perspective is presented by the resource-based view (RBV), which shifts the emphasis from interorganizational dependence to an organization's internal capabilities. Even when procedures are formally competitive and digitally standardized, their effectiveness depends on whether public administrations have the capacity to implement and monitor them. In the context of public procurement, these capabilities include legal expertise, digital skills, monitoring ability and the capacity to coordinate procurement activities across different organizational units. This perspective is especially important in digital procurement environments, where electronic platforms do not eliminate the need for administrative competence; instead, they underscore the importance of organizational capabilities within public administrations. Therefore, reforms in digital procurement should not be assumed to improve outcomes automatically. Their success is more likely where contracting authorities have the organizational resources to translate procedural formalization into effective contractual governance.

These theoretical frameworks are complementary rather than competing. Auction theory helps explain how procurement procedures are associated with bidding incentives and competitive behavior. RDT highlights how these procedures relate to interactions between public administrations and supplier markets in managing external dependencies, while the RBV emphasizes the role of internal administrative capabilities in the implementation and management of such procedures. Collectively, these approaches suggest that procurement outcomes are associated with the interaction of incentive structures, governance arrangements, and organizational capacity rather than a single mechanism. This integrated framework informs the empirical expectations developed below, particularly regarding how procedural design and supplier participation are jointly associated with contracting outcomes.

In addition, empirical research consistently indicates that competition intensity is associated with procurement efficiency, although the strength of this relationship varies across market conditions and institutional settings. Studies across Europe show that more competitive processes, reflected in greater bidder participation and more transparent award criteria, are generally associated with lower procurement costs and more favorable value outcomes (Flynn, 2018).

Conversely, in Italy, where administrative fragmentation and local discretion have historically hindered efficiency, several studies suggest that what truly matters is not merely the existence of competition but how it is organized and governed (Decarolis and Giorgiantonio, 2015). Chiappinelli (2020), analyzing data from European Union (EU) award notices, finds that decentralization is associated with lower bid rebates and greater efficiency losses, especially when procurement officials lack the necessary skills or mechanisms to manage competitive procedures effectively. This aligns with a broader body of literature emphasizing administrative capacity and professionalization as vital to procurement efficiency (Patrucco *et al.*, 2016).

Recent studies also show that the relationship between procedural openness and procurement performance is not unidirectional. Using Italian public works data, Coviello *et al.* (2018a, 2018b) find that greater buyer discretion increases the likelihood of repeated wins by the same firm, without necessarily worsening the procurement outcomes they observe. Their findings suggest that discretion may generate accountability concerns but may also allow public buyers to rely on reputational and relational mechanisms when contracts are incomplete. This insight complements Bajari *et al.* (2009), who argue that auctions may perform poorly when projects are complex, design is incomplete and *ex post* adaptation is important, because competitive bidding can restrict communication and reduce the ability to incorporate contractor expertise into project design. Together, these contributions indicate that procurement procedures should be understood not only as mechanisms for price competition but also as institutional arrangements that govern flexibility, discretion and *ex post* coordination.

Furthermore, the nature of recurring procurement contracts indicates that sustaining competition over time is equally important. Gnaldi and Del Sarto (2024) note that recurring contracting can create “incumbency advantages” that may weaken effective competition in the long run. This evidence supports the idea that procurement efficiency depends not only on price competition but also on institutional mechanisms that promote market transparency, openness and contestability over time.

While prior studies (Decarolis and Giorgiantonio, 2015; Coviello *et al.*, 2018a, 2018b; Chiappinelli, 2020) emphasize transaction frictions and administrative discretion as key mechanisms shaping procurement outcomes, these dimensions are not directly observable in the available data. Accordingly, this study focuses on contracting outcomes measured as the number of contracts defined within each procedure, which captures how procurement processes allocate demand across suppliers. Hence, the first hypothesis is formulated as follows:

- H1.* Competitive procurement procedures are associated with a higher number of contracts defined within each procedure, reflecting differences in contract allocation across procedural formats.

2.2 Institutional quality, governance and regulatory frameworks

Institutional quality is widely recognized as a crucial factor shaping procurement outcomes. Key elements, including legal enforcement, administrative capacity and anti-corruption measures, strongly influence the extent to which procurement systems translate competition into efficiency. Coviello *et al.* (2018a, 2018b) provide strong evidence that judicial inefficiencies delay contract enforcement and weaken buyers’ ability to enforce contracts.

Likewise, Decarolis (2014) showed that while screening mechanisms can raise administrative costs, they effectively filter out opportunistic bidders, thereby reducing the risk of performance failures. Collectively, these studies reinforce arguments in institutional

economics, suggesting that governance quality is essential in mediating the relationship between competition and efficiency (Flynn, 2018; Chiappinelli, 2020).

Research on governance highlights the negative effects of corruption and political connections on procurement efficiency. Wang *et al.* (2025) found that firms with political ties often exploit procurement relationships to gain unfair advantages, thereby reducing allocative efficiency. Similar studies of Italy's public sector have confirmed these issues, showing how political interference and a lack of transparency in contracting can hinder competition and increase costs (Sargiacomo *et al.*, 2015; Gnaldi and Del Sarto, 2024). Ongoing rent-seeking behavior and organized crime in procurement, particularly within local administrations, underscore the urgent need for digital transparency and integrity mechanisms (Fontana and D'Agostino, 2024).

Recent institutional reforms have aimed to address these weaknesses. The Italian *New Procurement Code* represents a significant overhaul of the procurement framework, intended to harmonize procedures, enhance transparency, and reduce administrative fragmentation. However, empirical evaluations of its effectiveness have yielded mixed results (Decarolis and Giorgiantonio, 2015). Comparative studies across European countries indicate that, despite these reforms, Italy continues to underperform in procurement efficiency (Flynn, 2018), suggesting the persistence of institutional constraints in decentralized governance contexts.

The debate between centralization and decentralization remains central to the literature on procurement efficiency. On one hand, centralization can leverage economies of scale, standardize procedures and reduce transaction costs. On the other hand, decentralization enables responsiveness to local needs and can foster innovation (Chiappinelli, 2020; Patrucco *et al.*, 2016). Empirical evidence from Italy indicates that efficiency gains from centralization depend on bureaucratic competence and institutional capacity. Decarolis and Giorgiantonio (2015) found that municipalities and utilities, which handle large shares of procurement but often lack specialized expertise, tend to achieve lower cost savings than regional or central authorities.

As a result, professionalization and capacity-building have become focal points for improving procurement performance. Patrucco *et al.* (2016) found that public procurement performance measurement systems enhance efficiency when they incorporate innovation, sustainability and compliance metrics alongside traditional cost indicators. This multidimensional approach aligns with the European shift toward value-based procurement (Flynn, 2018). However, the effectiveness of such reforms depends critically on human capital and organizational learning: procurement functions recognized as strategic within public institutions are more likely to develop mature management systems that support efficiency and accountability.

This perspective also aligns with the literature on centralized procurement strategies. Albano and Sparro (2010) argue that centralization can lower transaction costs through specialization, information sharing, ICT investments and demand aggregation. However, they also emphasize that procurement performance should not be judged solely by immediate price savings. Centralized and standardized procurement systems can also influence market structure, competition and broader policy goals. In this context, platforms such as MePa are not just technological tools but institutional mechanisms that coordinate purchasing behavior and shape how competition is organized.

While the literature often interprets supplier participation as an indicator of market openness and accessibility, the data used in this study capture participation at the level of individual procurement procedures rather than access to the procurement market as a whole. Accordingly, the analysis focuses on how variation in the number of participating suppliers

within procedures is associated with differences in contracting outcomes, without directly observing broader market access. In this sense, supplier participation is interpreted as a procedural-level characteristic of competition rather than a direct measure of system-wide openness.

Moreover, part of this relationship may reflect the structural features of procurement processes, as procedures involving more participating suppliers are inherently more likely to yield multiple contractual outcomes. Thus, the second hypothesis is formulated as follows:

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- H2.* A higher number of participating suppliers within a procurement procedure is associated with a greater number of contracts defined, reflecting differences in contract allocation within procedures.

2.3 E-procurement and digital transformation

Digital transformation has become a central driver of change in public procurement, reshaping how public administrations engage with markets and regulate access to public demand. Early empirical evidence from the Italian electronic marketplace shows that digital platforms reduce transaction costs, lower entry barriers and increase supplier participation, particularly among SMEs, while preserving some structural features of traditional markets, such as geographic proximity effects ([Albano et al., 2015](#)).

Beyond efficiency gains, the literature highlights the broader governance implications of e-procurement. Digital systems generate traceable and auditable records that can reduce corruption risks and strengthen integrity in public contracting ([Tammi et al., 2020](#)). They also enable data-driven approaches to sustainability and responsibility, supporting public value beyond cost minimization ([Chiarini et al., 2017](#)).

In addition, evidence on e-procurement outcomes further suggests that the effects of digitalization may emerge through participation and contractor selection rather than through prices alone. [Lewis-Faupel et al. \(2016\)](#) studying public works in India and Indonesia, find no systematic reduction in government payments, but show that e-procurement broadens the distribution of winners and improves quality-related outcomes. Their results suggest that e-procurement can facilitate entry by better contractors and widen access beyond local incumbents. Similarly, comparative evidence from Türkiye shows that the type of tender procedure is strongly associated with competition and contract prices: open tenders are associated with greater competition, whereas negotiated procedures are associated with higher prices and lower competitive intensity ([Özyürek and Erdal, 2025](#)). These studies reinforce the view that procedural rules and digital infrastructures jointly shape procurement outcomes by influencing who participates, under what conditions and to what extent transparency is achieved.

However, existing research consistently emphasizes that technological adoption alone is insufficient to deliver these benefits. The effectiveness of digital procurement reforms depends critically on institutional trust, procedural standardization and enforcement capacity ([Patrucco et al., 2016](#); [Flynn, 2018](#)).

In the Italian context, MePa is a key instrument in modernizing procurement practices. Its standardized and transparent procedures reduce information asymmetries and facilitate broader supplier participation, especially among SMEs ([Albano et al., 2015](#)). At the same time, persistent disparities in digital maturity and administrative capacity across contracting authorities continue to affect the uniform implementation of e-procurement. These challenges underscore that digital platforms operate within, and are shaped by, existing institutional frameworks.

A significant institutional development in this area is the Italian Law Decree No. 36/2023 (*Procurement Code*), which mandates the use of MePa for procedures. By making digitalization a legal requirement, the reform seeks to standardize procurement processes, enhance interoperability across public administrations and strengthen transparency through real-time monitoring. More broadly, the decree aims to address historical fragmentation in Italian procurement by embedding digital tools within a unified regulatory framework, thereby aligning national practices with the EU's digital governance agenda.

Recent studies have further expanded the analysis of public procurement by incorporating ethical, sustainability and public value dimensions. Comparative evidence shows that while Italian institutions tend to emphasize regulatory compliance, other systems rely more heavily on voluntary social and environmental standards (Chiarini *et al.*, 2017). At the same time, corruption and organized crime have been shown to undermine sustainability objectives and public value creation, particularly in contexts characterized by institutional weakness (Gnaldi and Del Sarto, 2024; Fontana and D'Agostino, 2024; Millemaci and Patti, 2025). These insights have contributed to the growing literature on the value of public procurement, which seeks to balance efficiency, transparency and equity objectives (Tammi *et al.*, 2020; Fontana and D'Agostino, 2024).

Overall, the literature suggests that procurement outcomes are given by the interaction of market competition, institutional quality, and technological innovation. Nevertheless, these dimensions are often examined separately. Auction-based studies focus on cost–performance trade-offs (Decarolis, 2014; Coviello *et al.*, 2018a, 2018b), research on digital procurement emphasizes transparency and participation (Albano *et al.*, 2015; Tammi *et al.*, 2020) and governance-oriented contributions stress the role of organizational capacity and professionalization (Patrucco *et al.*, 2016; Chiappinelli, 2020).

While the interaction between supplier participation and procedural design may be consistent with how procurement rules are associated with contract allocation, it may also reflect structural characteristics of competitive procedures, which are more likely to allow multiple contract awards. Accordingly, this pattern should be interpreted as heterogeneity in the association between supplier participation and contracting outcomes across procedural formats rather than as evidence of a causal governance mechanism. Therefore, the analysis focuses on how the relationship between supplier participation and contracting outcomes varies across procedural formats, without implying a direct causal effect.

Based on this interpretation, the third hypothesis is formulated as follows:

- H3.* The association between supplier participation and the number of contracts defined is stronger in competitive procedures than in noncompetitive procedures.

3. Data and methodology

3.1 Data set and data source

This study uses administrative microdata from CONSIP S.p.A., the Italian purchasing agency operating under the Ministry of Economy and Finance. CONSIP manages the MePa, the national electronic marketplace for public procurement in Italy.

The data set includes 6,550 procedures awarded on MePa by public administrations (P.A.) in 2024[1]. A procedure denotes a single tendering process initiated by one or more contracting authorities to purchase goods or services under a defined set of procedural rules (e.g. *RdO* or *TD*). Each procedure, therefore, represents an event that may result in the award of one or more contracts, depending on the demand structure and the number of suppliers involved.

In this study, the procedure is the unit of observation. Accordingly, the dependent variable, the number of contracts defined, captures the number of contractual relationships established within each procedure. This distinction is important for interpreting the empirical results, as variation in contracting outcomes reflects differences in how procurement procedures allocate demand among suppliers. The data set provides a comprehensive cross-sectional view of digital procurement activity during the first full year of implementation of the *New Procurement Code*.

In addition, the data set includes the number of participating suppliers and public administrations for each procedure, along with identifiers and descriptions of contracting authorities (type, region and province), suppliers (region and province), and purchasing categories. Descriptive statistics, descriptions of purchasing categories, variable definitions and the correlation matrix are provided in [Appendix 1](#) (Tables A1, A2, A3, A4 and A5 of the [Appendix 1](#), respectively).

To account for institutional and territorial differences, the empirical model incorporates fixed effects for MePa categories (common procurement vocabulary – CPV) [2], types of public administration and the geographical locations of both authorities and suppliers. The contracting authority categories include ministries, municipalities, universities, hospitals and research institutions. This data set provides a suitable context for examining how competition and procedural design relate to variation in contracting outcomes in Italy's digital public procurement system under the new regulations.

From a methodological perspective, using procurement data improves the validity and reliability of empirical analysis. First, construct validity is preserved because the variables directly reflect observable institutional features of procurement processes recorded on the MePa. Second, measurement reliability is enhanced because the data set is derived from standardized administrative records rather than from survey responses or self-reported data. All procedures on the MePa are documented through mandatory digital processes managed by CONSIP, ensuring consistent data collection and reducing the risk of reporting errors, recall bias or subjective interpretation. The operationalization of variables follows clear coding procedures based on the structure of the administrative data set. The operationalization of variables follows clear coding procedures based on the structure of the administrative data set.

3.2 *Dependent variable*

The dependent variable is the number of contracts defined (*n_contracts*) for each procedure managed on the Italian MePa in 2024. This variable captures the total number of individual contractual relationships established through a given procurement process, whether via a competitive procedure (*RdO*) or a discretionary direct negotiation (*TD*). Beyond measuring contracting volume, *n_contracts* reflects how procedures are associated with patterns of access to public markets and the distribution of contractual opportunities among economic operators.

From a governance perspective, a higher number of contracts defined within a procedure indicates greater procedural openness and a more decentralized allocation of public demand. By contrast, procedures resulting in a single contract typically reflect more concentrated and discretionary forms of market allocation.

[Figure 1](#) displays the distribution of *n_contracts*. The histogram shows a strongly right-skewed distribution, with most procurement procedures yielding a small number of contracts, often just one. In contrast, a limited number of procedures generate multiple contractual outcomes.

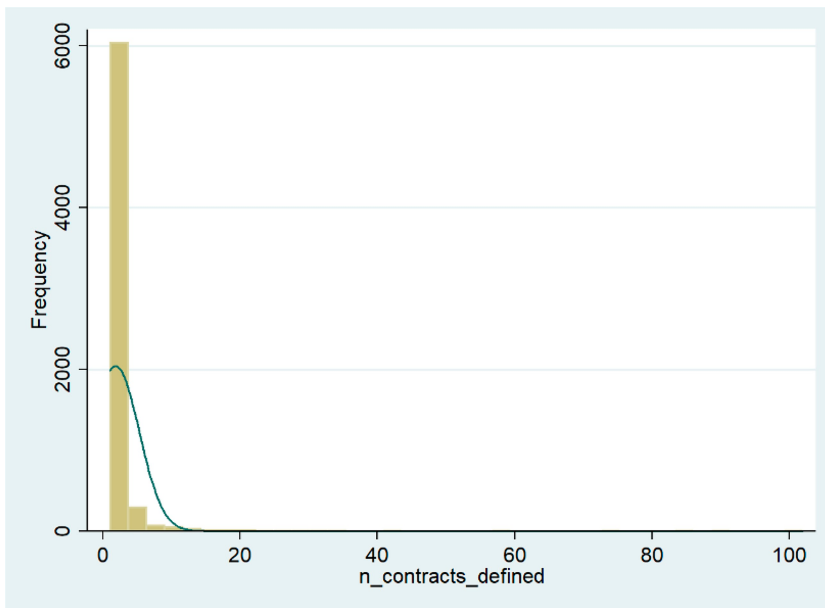


Figure 1. Distribution of $n_contracts$ defined in 2024 by P.A.
Source: Author's own elaboration on CONSIP data

This distribution indicates that while discretionary or narrowly structured procedures tend to concentrate contractual outcomes, more competitive or open procedures are associated with greater contract fragmentation. Consistent with the discrete, non-negative, and overdispersed nature of the dependent variable, the empirical analysis uses count-data models, specifically Poisson and Negative Binomial (NBREG) regressions, to examine how procedural design and supplier participation influence contracting outcomes.

Therefore, $n_contracts$ is interpreted not only as a measure of procedural outcomes but also as a reflection of the procedural steps leading to contractual agreements, and of how digital procurement rules, under the *New Procurement Code*, translate institutional frameworks into tangible governance outcomes. This view aligns with governance theories that regard procedural design as a key institutional feature associated with how public authorities organize competition and structure discretion.

3.3 Main independent variable

The primary independent variable is a binary indicator (RdO) that distinguishes between competitive and non-competitive procurement procedures. The variable takes the value 1 when the procedure is an *RdO* and zero otherwise.

The *RdO* is a competitive, rule-based electronic procurement process in which public administrations invite multiple qualified suppliers to submit bids via the MePa. The *RdO* reflects the level of procedural competitiveness present in each procurement event, highlighting the differences between open and discretionary contracting modes within the same digital system.

In contrast, the *TD* constitutes a noncompetitive negotiation between the public administration and a single supplier. It is typically used for low-value or urgent acquisitions, allowing greater procedural flexibility but involving limited competition and transparency.

Figure 2 complements this distributional evidence by comparing the average number of contracts defined in procurement procedures conducted through *TD* and *RdO*.

The figure shows that *TDs* are associated with a higher average number of contracts per procedure, whereas *RdOs* exhibit lower average contracting intensity. This descriptive pattern should be interpreted with caution. In fact, these descriptive and regression results are not contradictory, as they capture different dimensions of contracting outcomes (i.e., unconditional averages versus model-based conditional relationships).

The analysis also includes the number of suppliers participating in each procedure (*n_suppliers*), which quantifies market participation. More suppliers are expected to enhance the likelihood of multiple contract awards, reflecting stronger competitive pressure.

To evaluate the interaction between procedural design and supplier participation, an interaction term (*RdO* × *n_suppliers*) is added. This term allows us to assess whether the association between supplier participation and contracting outcomes is stronger under competitive *RdO* procedures than under direct negotiations. By incorporating these variables, the analysis captures both the institutional dimension (procedure type) and the market dimension (supplier participation) of competition. This enables us to examine how their interaction is associated with variation in contracting outcomes within Italy’s digital public procurement system.

3.4 Other control variables

The empirical analysis includes several control variables that account for institutional, sectoral and geographical differences across procurement events, thereby isolating the

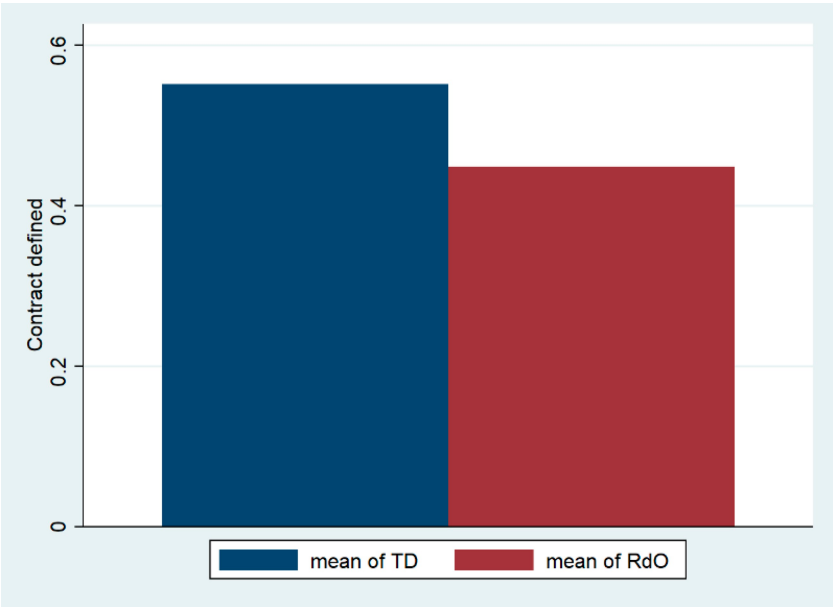


Figure 2. Average number of contracts defined by procurement procedure in 2024
Source: Author’s own elaboration on CONSIP data

specific effects of procedural design and market participation. The number of public administrations involved in each procedure (n_{PA}) indicates the level of institutional coordination. While multi-administration purchasing procedures can benefit from economies of scale, they may also face higher coordination and governance costs.

Additionally, the models incorporate a comprehensive set of fixed effects to control for unobserved differences. These fixed effects include public administrations, such as public territorial entities, hospitals, hospices, IRCCS, public medical centers, chambers of commerce, municipalities, government ministries, universities and national research councils. They also encompass product and service categories on the public electronic procurement platform. Geographical location is also considered, including both contracting authorities and suppliers at the regional and provincial levels.

These control variables help account for systematic differences in procurement practices across institutional types, market sectors and geographical contexts. Their inclusion is intended to help account for confounding contextual or structural factors, so that the estimated associations and interactions of the main explanatory variables more closely reflect differences in procedural competitiveness and market participation.

3.5 Empirical strategy

This study uses a count-data model to examine the relationship between procedural design, supplier participation and contracting outcomes in the Italian digital public procurement system. Since the dependent variable, the number of contracts ($n_{contracts}$), is a non-negative integer, a Poisson regression model is used. This specification is appropriate for discrete and right-skewed outcomes and assumes that the conditional mean and variance of the dependent variable are approximately equal (Wooldridge, 2010).

Although the theoretical framework refers to mechanisms such as transaction frictions and administrative discretion, these dimensions are not directly observable in the data set. Accordingly, the empirical strategy focuses on contracting outcomes at the procedure level and interprets the estimated coefficients as capturing systematic associations between procedural rules, supplier participation and contract allocation patterns. The following econometric equation describes the model:

$$n_{contracts} = \beta_0 + \beta_1 RdO_i + \beta_2 n_{suppliers_i} + \beta_3 RdO_i \times n_{suppliers_i} + \beta_4 n_{PA_i} + \gamma \mathbf{Z}_i + \mathcal{E}_i \quad (1)$$

where $n_{contracts}$ is the dependent variable, β_0 is the constant term, β_1 is the coefficient for RdO_i , β_2 is the coefficient for $n_{suppliers_i}$, β_3 is the coefficient for the interaction term and β_4 is the coefficient for n_{PA_i} . The coefficient γ refers to the vector $\mathbf{Z}_i$, which includes a comprehensive set of variables that control for the product category, type of public administration and the regional and provincial locations of the contracting authorities and suppliers. Finally, $\mathcal{E}_i$ is the error term that captures unobserved heterogeneity.

Equation (1) models both the expected relationship between procedural competitiveness (represented by RdO) and the interaction between procedural design and supplier participation (indicated by the same variables, along with supplier involvement).

Consistent with the hypotheses, a positive and statistically significant β_1 indicates that RdO are associated with a higher number of contracts, supporting $H1$. Likewise, $\beta_2 > 0$ indicates that greater supplier participation is associated with higher contracting activity within procedures, consistent with $H2$.

Finally, $\beta_3 > 0$ indicates that the marginal association between supplier participation and contracting outcomes is stronger in competitive procedures, highlighting differences in how participation relates to contract allocation across procedural formats, consistent with $H3$.

4. Results

[Table 1](#) presents the results from the econometric model described by [Equation \(1\)](#). These analyses examine the relationships between negotiation type (*RdO* vs *TD*), the number of suppliers and the number of contracts negotiated between public administration (PA) entities and suppliers on the MePa in Italy in 2024.

Before discussing the results, it is important to clarify that the empirical analysis identifies associations between procedural design, supplier participation and contracting outcomes, rather than directly testing underlying mechanisms such as transaction frictions, administrative discretion or market openness. These mechanisms are theoretically grounded in the literature but are not directly observable in the data ([Decarolis and Giorgiantonio, 2015](#); [Chiappinelli, 2020](#)).

All models include the total number of observations, *R*-squared, Pseudo *R*-squared, types of PA and categories of related commodities and services on MePa. Additionally, the effects of the region and province where PAs and suppliers are located are controlled for to account for systematic heterogeneity across categories. All are reported at the bottom of the table.

The first three columns present the results from the OLS baseline model, while the last three columns display the results from the Poisson model. Columns 3 and 6 present fully specified models, including the two main explanatory variables, *RdO* and *n_suppliers*, as well as their interaction term ($RdO \times n_suppliers$). For completeness, we focus our discussion on the results from the Poisson model, while the OLS estimates serve as a complementary check, showing that our findings are robust across different modeling approaches.

The results across all specifications are remarkably consistent in their signs and significance. The coefficient associated with the *RdO* is positive and statistically significant at the 5% and 1% levels (as shown in Columns 4–6). This finding indicates that, when other factors are held constant, competitive procedures are associated with a higher number of contracts than *TD*, which favors a single-negotiation route with a single supplier.

Additionally, in Column 4, a one-unit increase in *RdO* is associated with a 0.153-unit rise in the number of contracts. This corresponds to a 1.165% increase, implying an approximately 16.5% increase in the expected number of contracts [\[3\]](#). In Column 5, a one-unit increase in *RdO* is associated with a 0.143 increase in the predicted number of contracts, translating to a 15.4% increase. Finally, in Column 6, a one-unit increase in *RdO* corresponds to a 0.277 increase in the predicted number of contracts, which is associated with approximately a 32% increase in the number of defined contracts. These results support *H1*, indicating that competitive procedures are systematically associated with higher levels of contract allocation. In line with prior research on procedural design ([Decarolis, 2014](#); [Flynn, 2018](#)), this pattern is consistent with more distributed contracting structures.

The variable *n_suppliers*, presented in Columns 5 and 6, shows a positive and statistically significant effect at the 1% level. This suggests that an increase in the number of suppliers involved in the procurement process is associated with more contracts being awarded. Specifically, in Column 5, a one-unit increase in *n_suppliers* corresponds to a coefficient of 0.114, which translates to an approximate 12.1% increase in the expected number of contracts. In Column 6, the coefficient for *n_suppliers* is 0.172, implying an 18.8% increase in expected contracts. These findings support *H2* and indicate that variation in supplier participation is associated with differences in contracting outcomes at the procedure level. This pattern is consistent with previous studies on supplier participation in e-procurement systems ([Albano et al., 2015](#); [Tammi et al., 2020](#)). However, this relationship reflects participation within individual procedures and should not be interpreted as a direct measure of broader market openness or system-wide accessibility.

Table 1. Main estimated results

Variables	(1) Baseline <i>n_contract</i>	(2) Baseline <i>n_contract</i>	(3) Baseline <i>n_contract</i>	(4) Poisson <i>n_contract</i>	(5) Poisson <i>n_contract</i>	(6) Poisson <i>n_contract</i>
RdO	0.286** (0.118)	0.171** (0.0716)	0.608** (0.290)	0.153** (0.0624)	0.143*** (0.0529)	0.277*** (0.0599)
<i>n_suppliers</i>		2.002*** (0.135)	2.152*** (0.223)		0.114*** (0.0123)	0.172*** (0.0139)
RdO × <i>n_suppliers</i>						0.0773*** (0.0176)
<i>n_PA</i>	3.059*** (0.284)	-0.822*** (0.235)	-0.917*** (0.266)	0.755*** (0.0452)	0.512*** (0.0459)	0.374*** (0.0348)
Constant	-2.499*** (0.404)	-0.159 (0.183)	-0.398* (0.212)	-0.429*** (0.135)	-0.328*** (0.113)	-0.279** (0.118)
Type PA	Yes	Yes	Yes	Yes	Yes	Yes
Type MePa	Yes	Yes	Yes	Yes	Yes	Yes
Product category (CPV)	Yes	Yes	Yes	Yes	Yes	Yes
Region PA	Yes	Yes	Yes	Yes	Yes	Yes
Province PA	Yes	Yes	Yes	Yes	Yes	Yes
Region supplier	No	Yes	Yes	Yes	Yes	Yes
Observations	6,550	6,550	6,550	6,550	6,550	6,550
R-squared	0.158	0.748	0.752			
Pseudo R-squared				0.1594	0.2847	0.3022

Note(s): Robust standard errors in parentheses **** $p < 0.01$, *** $p < 0.05$ and ** $p < 0.1$

The interaction term $RdO \times n_suppliers$, presented in Column 6, is positive and statistically significant at the 1% level, with a coefficient of 0.0773. This suggests that the association between RdO and the number of contracts is stronger at higher levels of supplier participation, corresponding to an additional 8.0% increase in the expected number of contracts per additional supplier when RdO increases by one unit. More broadly, this pattern indicates that the association between supplier participation and contract allocation is stronger under competitive procedures as the number of participating suppliers increases.

This result is consistent with $H3$ and indicates that the relationship between participation and contracting outcomes varies across procedural formats. This interpretation is consistent with institutional perspectives suggesting that competition depends on how it is organized within procedural frameworks (Coviello *et al.*, 2018a, 2018b; Chiappinelli, 2020). Importantly, this pattern should be interpreted as heterogeneity in the association between supplier participation and contracting outcomes across procedural formats, rather than as evidence of a causal governance mechanism. Part of the observed relationship may reflect structural characteristics of competitive procedures, such as their greater compatibility with multiple contract awards. Accordingly, the interaction is interpreted as capturing differences in the strength of association rather than a causal amplification mechanism.

Among the control variables, n_PA , representing the number of public administrations involved, is consistently positive and statistically significant across Columns 4–6. This indicates that greater public administration participation in the procurement process is associated with a higher number of contract awards.

In Column 4, a one-unit increase in n_PA corresponds to a coefficient of 0.755, translating to a 112.7% increase in expected contracts. In Column 5, the coefficient is 0.512, equivalent to a 66.9% increase. In Column 6, the coefficient is 0.374, representing a 45.4% increase in the expected number of contracts.

Finally, the inclusion of controls for product categories, institutional types and geographical characteristics accounts for structural heterogeneity in procurement processes. These controls ensure that the observed relationships between procedural design, supplier participation and contracting outcomes are not driven by sector-specific or institutional differences.

4.1 Robustness check

4.1.1 *Alternative model specification.* Table A6 in Appendix 2 presents the results of the NBREG models, estimated as a robustness check to account for potential overdispersion in the count-dependent variable ($n_contracts$). Across all three specifications, the results are broadly consistent with those from the earlier Poisson estimations, confirming the stability and reliability of the main findings. The coefficient for the RdO remains positive and statistically significant in the first two models (Columns 7–8), although its magnitude decreases slightly relative to the baseline Poisson specification. This suggests that competitive procedures remain positively associated with a higher likelihood of receiving awarded contracts, even after controlling for unobserved heterogeneity in the count process. The effect of the number of suppliers with defined contracts ($n_suppliers$) is positive and highly significant across all specifications, confirming that broader supplier participation is associated with higher contracting activity.

In Column (9), the inclusion of the interaction term ($RdO \times n_suppliers$) yields a positive and statistically significant coefficient (0.0154, $p < 0.05$), indicating that the positive association between competitive procedures and contracting outcomes is stronger at higher levels of supplier participation. This result aligns with theoretical expectations and may be consistent with a stronger association between supplier participation and contracting

outcomes under *RdO* procedures, as well as with higher levels of contract fragmentation and market participation. The coefficient on n_PA remains positive and significant throughout, reinforcing the role of institutional involvement in expanding contract volumes. The negative and significant constant term suggests that the expected number of contracts is relatively low in the absence of competitive procedures and supplier participation.

All specifications include fixed effects for type of PA, MePa category and regional and provincial location, ensuring that the results are not driven by structural or geographical heterogeneity. The significant negative estimates of $\ln\alpha$ across all columns confirm overdispersion, thereby justifying the use of the NBREG model over the standard Poisson specification. Overall, these results corroborate the robustness of the main findings.

4.1.2 Instrumental variable approach. The use of *RdO* may be associated with unobserved factors, such as management quality, digital maturity or local procurement culture, which could also affect the number of contracts established.

The instrumental variable (IV) approach is introduced as an additional robustness exercise to address potential endogeneity in the choice of procurement procedure. The IV strategy does not fully eliminate identification concerns. Still, it exploits exogenous variation in procedural adoption driven by peer behavior, thereby providing additional evidence consistent with the robustness of the observed association.

To address potential endogeneity, we construct a set of instruments that exploit exogenous variation in procedural norms across comparable public administrations. Specifically, we create three “leave-one-out” instruments to measure the propensity to use *RdO* within the relevant peer groups, as reported in [Appendix 3 \[4\]](#).

The first instrument, z_{rc_loo} , is the leave-one-out share of *RdO* procedures among other public administrations operating in the same region. This variable captures local procedural habits and regulatory environments that influence how administrations within the same market context adopt *RdO* but are plausibly exogenous to an individual administration’s specific contracting decisions.

The second instrument, $z_{cat_other_regs}$, represents the average share of *RdO* procedures within the same MePa category across regions. By excluding the local area, this measure captures national procedural trends within each product/service category while mitigating concerns that regional shocks to procurement behavior may bias identification.

The third instrument, z_{ptc_loo} , is the leave-one-out *RdO* share within the same $type_PA \times Category\ MePa$. This variable captures procedural norms across comparable administrative types that face similar bureaucratic and operational constraints.

These instruments exploit cross-sectional variation in peer adoption of *RdO* across aggregation levels, capturing differences in the propensity of administrations to use competitive procedures. Peer procedural norms are associated with individual administrations’ adoption of *RdO* through organizational learning, benchmarking and regulatory imitation, mechanisms well documented in procurement practice, while remaining plausibly unrelated to procedure-specific contracting outcomes.

The IV can be expressed as a two-stage system estimated on the 2024 cross-sectional sample to formalize the empirical strategy. In the first stage, the potentially endogenous adoption of the *RdO* is instrumented using peer procedural norms observed across comparable public administrations:

$$RdO_i = \pi_0 + \pi_1 z_i^{rc_loo} + \pi_2 z_i^{cat_other_regs} + \pi_3 z_i^{ptc_loo} + \pi' X_i + \mu_i, \quad (2)$$

where X_i denotes control variables such as the number of suppliers with defined contracts, participating public administrations and categorical and regional fixed effects. The

coefficients π_1, π_2, π_3 capture the relevance of peer procedural norms in explaining variation in *RdO* adoption.

In the second stage, the predicted value $\widehat{RdO}_i$ obtained from the first stage is used to estimate its estimated relationship on contracting intensity:

$$n_contracts_i = \beta_0 + \beta_1 \widehat{RdO}_i + \beta' X_i + \varepsilon_i, \quad (3)$$

where $n_contracts_i$ represents the number of contracts defined by administration i , and β_1 captures variation in contracting outcomes associated with predicted differences in *RdO* adoption among administrations influenced by peer norms. Thus, Table A7 in Appendix 2 presents the instrumental-variable regression estimates from Equation (3).

The baseline IV regression in Column (10) excludes additional covariates and shows a positive, statistically significant effect: administrations that use *RdO* define, on average, 0.42 more contracts than comparable entities that do not use this competitive procedure.

When observable controls, including the number of suppliers with defined contracts and the number of participating public administrations, are added in Column (11), the magnitude of the *RdO* coefficient declines to 0.16. Still, it remains highly significant at the 1% level. Including these variables, both strongly related to procurement volume, accounts for much of the cross-sectional variance. In the complete specification with category and region fixed effects (Column 12), the coefficient on *RdO* slightly increases to 0.25. The result remains statistically significant at the 5% level, suggesting robustness to unobserved heterogeneity across product/service categories and geographical areas.

The control variables behave as expected: the number of suppliers with defined contracts is significantly and positively correlated with the number of contracts, suggesting that greater supplier participation is associated with higher levels of contracting activity. Conversely, the number of public administrations involved is negatively and significantly associated, suggesting possible coordination or governance frictions in multi-PA procedures. The interaction term, significant at the 10% level, points to modest complementarities between supplier participation and procedural competitiveness.

Overall, the IV estimates support the interpretation that competitive procurement procedures are positively correlated to a more active contract definition for MePa. The consistency of the coefficient across specifications, along with the substantial increase in explanatory power (R^2 from 0.001 to 0.747), underscores the robustness of this relationship.

While the IV results provide additional support for the main findings, they should be interpreted with caution, given the cross-sectional nature of the data and the reliance on peer-based instruments.

4.2 Implications for discretion and administrative authority

The empirical findings are consistent with a governance interpretation in which digital procurement is associated with specific patterns in public contracting outcomes. The positive association between competitive, rule-based procedures, *RdO*, and the number of contracts awarded suggests that procedural design is associated with more structured and less discretionary patterns of contract allocation rather than serving as a technical tool for efficiency. Unlike direct negotiations, which rely on bilateral interactions and allow more informal bargaining, the *RdO* embeds procurement decisions within standardized, transparent frameworks. This is consistent with more standardized and less individualized patterns of contract allocation (Decarolis and Giorgiantonio, 2015; Bosio et al., 2022).

At the same time, the role of discretion in procurement is more nuanced than a simple trade-off between “more” or “less” control. Evidence from Coviello et al. (2018b) shows that

greater discretion can sustain repeated relationships between buyers and suppliers without necessarily worsening observed procurement outcomes, highlighting the potential role of reputational mechanisms and relational contracting under incomplete contracts. Similarly, [Bajari et al. \(2009\)](#) argue that competitive bidding may be less effective in complex procurement settings where design is incomplete and ex post adaptation is required, as rigid procedures can limit communication and flexibility.

From this perspective, the *RdO* can be interpreted as an institutional commitment device. By setting predefined participation rules, timelines and evaluation criteria within the MePa, competitive digital procedures require public administrations to follow observable, enforceable processes. This proceduralization of procurement is associated with lower ex post flexibility and greater ex ante predictability for market participants and is consistent with a shift of authority toward more rule-based institutional arrangements ([Decarolis, 2014](#); [Flynn, 2018](#)). Consequently, competition appears not only more intense but also more structured within procedural frameworks associated with the organization of access to public demand and state–market relations.

The interaction between *RdO* adoption and supplier participation is consistent with this interpretation. The rise in contracting outcomes in procedures with both rule-based design and broader participation suggests that openness and competition are closely associated in settings with more standardized, less discretionary allocation patterns. When procedural rules are weak or negotiable, greater participation may not yield more inclusive or varied contracting outcomes. This aligns with evidence that competition without credible institutional enforcement can fail to produce governance improvements ([Coviello et al., 2018a, 2018b](#); [Chiappinelli, 2020](#); [Özyürek and Erdal, 2025](#)).

Moreover, the results underscore the crucial role of administrative capacity in mediating the effects of digitalization. Digital procurement platforms do not automatically eliminate discretion; instead, they shift where that discretion lies. Successful implementation of competitive procedures requires organizational capabilities, including legal expertise, digital skills and monitoring capabilities. When these capabilities are uneven, digital tools may perpetuate existing institutional disparities rather than rectify them ([Patrucco et al., 2016](#); [Caserta et al., 2025](#)). This finding aligns with previous research showing that procedural reforms yield governance gains only when implemented in sufficiently professionalized administrative environments.

Overall, these findings suggest that the governance implications of digital procurement are less related to automation itself and more to the procedural reconfiguration of authority. By embedding competition within standardized digital rules, platforms such as MePa can be interpreted as institutional arrangements associated with how public administrations exercise authority, constrain discretion and regulate market access ([Bosio et al., 2022](#); [Bauhr et al., 2020](#)). This highlights the importance of examining the institutional conditions under which digital reforms are associated with differences in accountability and the governance of public spending, rather than focusing solely on short-term efficiency gains ([Albano et al., 2015](#)).

5. Discussion

This study examines the relationship between procedural design and contracting outcomes in a digital public procurement system. Empirical analysis reveals a consistent association between competitive procurement procedures, specifically the *RdO*, and increased contracting activity on the MePa platform. Rather than interpreting this relationship solely as a technical efficiency improvement, the results suggest that procedural rules embedded in digital procurement systems may be associated with how competition is organized and how contractual opportunities are distributed among suppliers. These findings are interpreted

through an integrated framework in which procurement outcomes can be understood as reflecting the interaction between incentive structures, governance arrangements and administrative capabilities.

From an auction theory perspective, the observed correlation between competitive procedures and contracting outcomes aligns with theoretical propositions that structured competition is associated with more dynamic procurement markets (Decarolis, 2014; Albano *et al.*, 2015). Competitive procurement formats establish transparent bidding environments in which suppliers participate under standardized regulations, thereby reducing information asymmetries and enabling more precise bid comparisons. Previous research has demonstrated that procurement performance is predominantly linked to the institutional configuration of purchasing procedures rather than to competition *per se* (Flynn, 2018; Coviello *et al.*, 2018a, 2018b). In this context, the positive association between *RdO* and the number of contracts can be interpreted as consistent with the idea that rule-based procurement formats are associated with procurement environments characterized by greater supplier engagement and a more decentralized distribution of contractual opportunities.

The findings also align with insights from RDT. This theory suggests that public organizations depend on external markets for essential resources and develop institutional practices to manage these dependencies. Procurement procedures serve as one such governance tool. Competitive processes like *RdO* give access to a broader range of suppliers, which may be associated with lower dependence on limited or bilateral procurement arrangements. Consequently, the relationship between *RdO* procedures and contracting results may be interpreted as reflecting how rule-based procurement methods are associated with interactions between public agencies and supplier markets. Rather than engaging in discretionary negotiations with individual suppliers, these competitive procedures are more commonly associated with environments characterized by wider participation and more dispersed contractual relationships.

These perspectives are complementary rather than competing. Auction theory helps explain how procurement procedures are associated with bidding incentives; RDT highlights how these procedures relate to interactions between public administrations and supplier markets; and the RBV emphasizes the role of internal administrative capabilities in implementing and managing such procedures. Together, these approaches suggest that contracting outcomes can be viewed as reflecting the interaction between incentive structures, governance arrangements and organizational capacity, rather than arising from any single mechanism in isolation.

This interpretation is also consistent with research showing that the effects of procedural choice depend on the trade-off between openness and flexibility. Bajari *et al.* (2009) argue that competitive bidding is less suitable when projects are complex and contractual design is incomplete, because auctions can limit communication and make *ex post* adaptation costly. By contrast, Coviello *et al.* (2018a) show that discretionary procedures may sustain repeated relationships without necessarily worsening procurement outcomes.

The results regarding supplier participation support this interpretation. The positive association between the number of participating suppliers and contracting outcomes suggests that broader market participation correlates with increased contracting activity. This finding aligns with the integrated framework: from an auction theory perspective, increased participation intensifies competition, while the RDT suggests that a larger supplier pool expands access to external resources. Concurrently, the RBV suggests that translating this participation into effective contract allocation depends on the administrative capabilities of contracting authorities.

This positive association can also be interpreted in light of the broader e-procurement literature. [Lewis-Faupel et al. \(2016\)](#) show that digital procurement can broaden the distribution of winners and improve quality-related outcomes even when prices do not fall, suggesting that digital systems matter by facilitating entry and changing contractor selection. This pattern is consistent with previous research showing that digital procurement platforms can facilitate supplier entry and lower transaction barriers, particularly for SMEs ([Albano et al., 2015](#); [Tammi et al., 2020](#)).

The role of administrative participation provides additional insight into the institutional dynamics of digital procurement. The positive correlation between the number of participating public administrations and contracting outcomes suggests that multi-administration procurement processes typically lead to higher contracting activity. One possible interpretation is that collaborative procurement arrangements facilitate demand aggregation and expand the scope of procurement efforts. At the same time, the variation across different specifications indicates that coordination among multiple administrations can introduce organizational complexity. This interpretation aligns with arguments from the RBV, which emphasizes that procurement performance heavily depends on organizational capabilities such as administrative expertise, digital skills and monitoring capacity ([Patrucco et al., 2016](#); [Caserta et al., 2025](#)).

Even when procurement procedures are standardized through digital platforms, their success still relies largely on the capabilities of the public administrations overseeing them. This reinforces the integrated perspective that procurement outcomes depend not only on procedural rules and market structure but also on the capacity of public administrations to implement and manage these processes effectively.

Therefore, these findings add to the broader literature on digital governance in public procurement. Prior research has often highlighted the transparency and efficiency benefits of electronic procurement platforms ([Albano and Sparro, 2010](#); [Albano et al., 2015](#); [Tammi et al., 2020](#)). Digital platforms like MePa standardize procurement procedures, create traceable records and are associated with more structured interactions between public administrations and supplier markets.

This perspective also helps interpret why supplier participation alone may not always be associated with improved procurement outcomes. When procedures remain discretionary or weakly institutionalized, increased participation may merely raise the number of bidders without being clearly associated with differences in contracting dynamics. Conversely, when participation occurs within clearly defined competitive procedures, such as *RdO*, the relationship between market openness and contracting activity appears stronger.

This pattern should be interpreted as heterogeneity in the association between supplier participation and contracting outcomes across procedural formats rather than as evidence of a causal governance mechanism. Within an integrated framework, auction theory suggests that competitive environments may be more responsive to variation in participation, while the RDT highlights how procedural rules relate to access to supplier markets. Consistent with the RBV and the limitations of the empirical design, this relationship may partly reflect structural features of competitive procedures rather than a distinct governance effect. This observation aligns with institutional analyses indicating that the effectiveness of competition depends not only on the number of market participants but also on the procedural frameworks governing it ([Decarolis and Giorgiantonio, 2015](#); [Flynn, 2018](#)).

These results highlight the importance of procedural design as an institutional component of digital procurement systems. Competitive procedures are systematically associated with procurement environments characterized by broader market access and more distributed contracting outcomes. Consequently, digital procurement platforms can be interpreted as institutional infrastructures associated with the organization of competition through

standardized rules rather than discretionary administrative decisions (Bosio *et al.*, 2022; Bauhr *et al.*, 2020).

By emphasizing these relationships, this study contributes to debates regarding the governance implications of digital procurement reforms. The findings suggest that procurement outcomes are associated with the institutional structure of competition, in relation to procedural rules and administrative capabilities, thereby highlighting the relevance of institutional design in the functioning of digital procurement markets.

Overall, these findings support an integrated interpretation in which procurement outcomes can be understood as reflecting the interaction of incentive structures, governance arrangements and administrative capabilities, reinforcing the need to consider procedural design, market participation and organizational capacity jointly rather than in isolation.

6. Conclusion

This study analyzed the relationship between procurement procedural design and contracting outcomes within the digital public procurement system in Italy. Using administrative data from the MePa platform, the analysis demonstrates that competitive and rule-based procedures, particularly the *RdO*, are consistently associated with higher levels of contracting activity. These findings suggest that procurement outcomes are associated with how competition is organized through procedural rules and digital infrastructures (Decarolis, 2014; Patrucco *et al.*, 2016; Flynn, 2018; Chiappinelli, 2020).

Beyond this empirical outcome, the findings are consistent with a governance-focused interpretation of digital procurement systems. Instead of removing administrative discretion, digital procedures seem to be associated with a reorganization of administrative discretion within standardized and transparent frameworks.

In this way, competitive procedures can be interpreted as associated with more standardized, less discretionary allocation patterns. Consistent with Decarolis and Giorgiantonio (2015, 2019), the results suggest that the design of procurement rules, rather than transparency alone, is closely tied to how efficiency, fairness and accountability are achieved within decentralized procurement systems.

These insights add to the literature on public procurement and digital governance by highlighting the institutional aspect of digital procurement systems.

From an RDT perspective, procurement procedures can be interpreted as governance tools that public administrations use to manage relations with external supplier markets. Competitive procedures tend to occur in environments with wider supplier involvement and more dispersed contractual arrangements. This aligns with previous findings on how institutional design is associated with state–market interactions (Guccio *et al.*, 2014; Coviello *et al.*, 2018a, 2018b; Chiappinelli, 2020).

At the same time, the findings are consistent with the RBV of public organizations, which highlights the importance of administrative skills in implementing procurement reforms (Decarolis and Giorgiantonio, 2015; Patrucco *et al.*, 2016; Caserta *et al.*, 2025). Even within standardized digital platforms, procurement outcomes remain closely tied to the organizational capacities of public administrations responsible for implementing procedural rules and managing supplier relationships. By situating digital procurement systems within broader governance frameworks, this study contributes to ongoing discussions on the institutional foundations of digital public administration and procurement modernization (Albano *et al.*, 2015; Tammi *et al.*, 2020; Bosio *et al.*, 2022).

However, this study highlights several limitations that frame its empirical contribution and suggest directions for future research. First, the analysis relies on a cross-sectional data set from a single year (2024), which restricts the ability to observe dynamic learning

processes, institutional adaptation and potential path dependencies in procurement behavior. Digital procurement reforms, especially those related to implementing the new Procurement Code, may have gradual effects over time as public administrations adjust their practices and build organizational capabilities. Future research could, therefore, use panel data or longitudinal designs to examine how procurement procedures and outcomes change across regulatory cycles and stages of institutional learning.

Second, although the empirical strategy uses an instrumental-variables approach to address potential endogeneity, some unobserved factors may still influence the estimated relationships. Specifically, elements such as digital maturity, organizational culture, managerial quality and informal governance practices are not directly observable in the data set. However, they could be linked to both procedural choices and procurement outcomes. Future research could address these limitations by incorporating survey-based measures, qualitative data or matched administrative data sets to better understand these hidden organizational factors.

Third, the analysis centers on contracting intensity, measured by the number of contracts established in each procurement procedure. Although this metric offers valuable insights into the structure of procurement outcomes, it does not encompass other pertinent dimensions of procurement performance, such as contract value, price efficiency, innovation content, sustainability criteria or the quality of contract execution, all of which are increasingly integral to contemporary procurement policy agendas (Tammi *et al.*, 2020). Future research may expand the scope of analysis by integrating multidimensional performance indicators, thereby facilitating a more comprehensive evaluation of procurement efficacy.

Fourth, the study is set within the institutional context of the Italian MePa platform, which operates under a specific regulatory and administrative framework. While this provides a rich empirical environment, it may limit how well the findings apply to procurement systems with different levels of centralization, enforcement or digital integration. Comparative research across EU and OECD contexts could help clarify how institutional factors, such as judicial efficiency, oversight mechanisms and administrative professionalization, shape the relationship between procedural design and procurement outcomes (Coviello *et al.*, 2018a, 2018b; Bosio *et al.*, 2022; Bauhr *et al.*, 2020; Boykin *et al.*, 2025; Broggil, 2008).

Overall, these findings indicate that “one size fits all” approaches to procurement design may overlook critical institutional differences, as contracting outcomes are closely associated with how procedural competition is structured within digital public procurement systems, and should therefore be interpreted as evidence of systematic differences in association across procedural formats rather than as direct evidence of causal mechanisms linking procedural design to contracting

6.1 Practical implications

The findings of this study provide several policy implications for policymakers and public procurement practitioners. These implications are grounded in the observed empirical associations and should not be interpreted as direct evidence of causal effects or underlying mechanisms.

First, the mandatory implementation of MePa under Law Decree No. 36 / 2023 provides an important opportunity to enhance procurement governance. However, the empirical findings suggest that digitalization alone may not be sufficient. Instead, the results indicate that contracting outcomes are closely associated with how competition is structured through procedural rules and how supplier participation is organized within these frameworks. In this context, policymakers may consider prioritizing procedural standardization alongside platform adoption. The evidence shows that competitive formats such as *RdO* are associated with more distributed contracting patterns, which are consistent with more structured allocation mechanisms. At the same time, these procedures may increase administrative and

compliance burdens, particularly for smaller contracting authorities. This suggests the importance of aligning procedural requirements with administrative capacity rather than applying uniform rules across heterogeneous institutions.

In addition, the findings highlight that supplier participation is more strongly associated with contracting outcomes when embedded within structured procedural environments. This suggests that policy interventions aimed at expanding participation may be more effective when combined with clear procedural rules and monitoring mechanisms.

Finally, the results point to the relevance of administrative capacity in shaping procurement outcomes. Investments in digital skills, legal expertise and monitoring capabilities may therefore play a critical role in enabling public administrations to implement standardized procedures effectively. While these implications are consistent with broader theoretical arguments on procurement governance, they should be interpreted as informed by observed empirical associations rather than as direct evidence of causal mechanisms.

Acknowledgements

The authors was deeply grateful to Dr. Fabrizio Lanzafame, his colleague at the National Research Council (CNR), for teaching me public administration and for sharing both his theoretical knowledge and practical experience in the field.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

Data availability

Data are available upon reasonable request to the author.

Notes

- [1.] In EU procurement terminology, “procedure” typically refers to a procurement method (e.g. open procedure). In this paper, the term denotes a single tendering event (unit of analysis), consistent with the structure of the Italian MePa data set.
- [2.] In the Italian MePa, CPV in MePa refers to the mandatory, hierarchical eight-digit European codes used to uniquely classify goods and services, ensuring standardized descriptions in public tenders. It acts as a digital tag connecting company offerings to public demand.
- [3.] In a Poisson regression: $\log(E[Y|X]) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + e_{it}$. Where $E[Y|X]$ = expected count of the dependent variable and β_i = coefficient for predictor X_i ; the effect of a one-unit increase in X_i is given by % change in expected count = $(e^{\beta_i} - 1) \times 100$.
- [4.] The validity of these instruments rests on two primary conditions: (i) *relevance*, since procedural norms and adoption rates within comparable peer groups strongly predict the likelihood of using RdO and (ii) *exogeneity*, as the leave-one-out construction ensures that each unit’s own contracting outcomes are excluded from the computation of the instruments, mitigating mechanical correlation between the instrument and the error term. All estimates are based on a cross-sectional design for 2024; therefore, identification relies on spatial rather than temporal variation.

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Further reading

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Table A1. Variable measurement and operationalization matrix

Variable	Type	Description	Operationalization	Expected sign	Source
n_contracts_defined	Dependent variable	Number of individual contracts awarded within a procurement procedure.	Count variable measuring the total number of contracts defined in each procedure	–	CONSIP
RdO	Independent variable	Indicator of procedural competitiveness (request for offers).	Dummy equals 1 = RdO (competitive procedure); 0 = TD (direct negotiation)	+	CONSIP
n_suppliers_w_contract_defined	Independent variable	Number of suppliers awarded at least one contract within the procurement procedure.	Count variable capturing the number of participating suppliers awarded contracts	+	CONSIP
RdO × n_suppliers	Interaction term	Interaction between procedural competitiveness and supplier participation, testing whether participation effects are stronger under competitive procedures.	Multiplicative interaction between RdO and the number of suppliers	+	Authors' elaboration from CONSIP
n_PA	Control variable	Number of public administrations involved in the procurement procedure. Reflects institutional coordination and demand aggregation.	Count variable representing the number of participating contracting authorities	+	CONSIP
type_PA	Control variable	Type of contracting authority conducting the procurement procedure (e.g. ministries, municipalities, universities, hospitals and research institutions).	Categorical variable included as fixed effects	N/A	CONSIP
type_MEPA	Control variable	Type of procurement category within the MePa platform.	Categorical variable: 1 = goods; 2 = services	N/A	CONSIP
Product category (CPV)	Control variable	Product or service category according to the common procurement vocabulary classification.	Categorical variable included as fixed effects to control for sector-specific procurement differences	N/A	CONSIP
region_PA	Control variable	The region where the contracting public administration is located. Controls for regional institutional differences.	Regional fixed effects	N/A	CONSIP

(continued)



Table A1. Continued

Variable	Type	Description	Operationalization	Expected sign	Source
province_PA	Control variable	The province where the contracting public administration is located. Captures local institutional heterogeneity.	Provincial fixed effects	N/A	CONSIP
region_supplier	Control variable	Region where the awarded supplier is located. Controls for geographical market structure.	Regional fixed effects	N/A	CONSIP
year	Control variable	Year in which the procurement procedure was completed.	Dummy equals 2024	N/A	CONSIP
Source(s): Author's elaboration on CONSIP data					

Table A2. Type of P.A. involved in e-procurement procedures

Type of public administration	Frequency	%	Cumul. %
Public utility companies and territorial service entities	70	1.07	1.07
Hospital trusts, university hospitals, IRCCS and zoo prophylactic institutes	306	4.67	5.74
Local and provincial health authorities	430	6.56	12.31
Chambers of commerce	83	1.27	13.57
Municipalities	205	3.13	16.70
Ministries and fiscal agencies	2,906	44.37	61.07
Universities and polytechnics	2,550	38.93	100.00
Total	6,550	100.00	

Source(s): Author's elaboration on CONSIP data

Table A3. Type of MePa category by goods and services

Product category	Frequency	%	Cumulative
Database access services	70	1.07	1.07
Photovoltaic accessories	2	0.03	1.10
Needles and syringes	1	0.02	1.11
Other medical devices	204	3.11	4.23
Antiseptics, disinfectants, chemicals, nondiagnostic reagents and technical gases	167	2.55	6.78
Network equipment – MePa goods	72	1.10	7.88
Network equipment – MePa services	39	0.60	8.47
Storage area network equipment – MePa goods	29	0.44	8.92
Storage area network equipment – MePa services	10	0.15	9.07
Electromedical equipment	80	1.22	10.29
Air conditioning equipment	44	0.67	10.96
Compact, rotating archives and shelving systems	13	0.20	11.16
Outdoor furniture	9	0.14	11.30
Laboratory, health care and postmortem furniture	41	0.63	11.92
Nursery and preschool furniture	1	0.02	11.94
Library furniture	5	0.08	12.02
Office furniture and accessories	85	1.30	13.31
University and community furniture	25	0.38	13.69
School furniture	7	0.11	13.80
Kitchen and tableware equipment	24	0.37	14.17
Road equipment and signage	23	0.35	14.52
Musical equipment	11	0.17	14.69
Detection, assistance, maintenance and repair equipment – MePa goods	39	0.60	15.28
Detection, assistance, maintenance and repair services – MePa services	9	0.14	15.42
Recreational and sports equipment	18	0.27	15.69
Audio, photo, video and lighting equipment	23	0.35	16.05
Incontinence aids	2	0.03	16.08
Technical aids for persons with disabilities	3	0.05	16.12
Meal vouchers	7	0.11	16.23
Stationery	69	1.05	17.28
Network fuel	1	0.02	17.30
Paper products	26	0.40	17.69
Transparent enclosures, frames and solar shading systems	4	0.06	17.76
Heating fuels	21	0.32	18.08
Copying and printing consumables	46	0.70	18.78
Personal protective equipment and safety equipment	28	0.43	19.21
Communication devices and systems	25	0.38	19.59
Orthopedic endoprostheses and osteosynthesis systems	1	0.02	19.60
Enterprise and specialized systems – MePa goods	5	0.08	19.68
Enterprise and specialized systems – MePa services	19	0.29	19.97
Pharmaceuticals	112	1.71	21.68
Hardware supplies	135	2.06	23.74
Qualified electronic signature services	2	0.03	23.77
Textile supplies	23	0.35	24.12
Photography, optics, audio and video – MePa goods	39	0.60	24.72
Photography, optics, audio and video – MePa services	18	0.27	24.99
Fuel generators, condensing boilers and related services	2	0.03	25.02
Management of competitive examination procedures	11	0.17	25.19
In vitro diagnostic medical devices (IVD)	4	0.06	25.25

(continued)

Table A3. Continued

Product category	Frequency	%	Cumulative
Personal hygiene and care products	4	0.06	25.31
Heat pump systems for climate control and related services	6	0.09	25.40
Fire prevention systems	33	0.50	25.91
Electrical and special systems	66	1.01	26.92
Lifting systems (elevators)	102	1.56	28.47
Thermo-hydraulic and air-conditioning systems	51	0.78	29.25
General clothing and accessories	12	0.18	29.44
ICT infrastructure – MePa goods	25	0.38	29.82
ICT infrastructure – MePa services	74	1.13	30.95
Digital interaction with users	5	0.08	31.02
Books and publications	6	0.09	31.11
Software licenses – MePa goods	138	2.11	33.22
Software licenses – MePa services	132	2.02	35.24
Lubricants and functional fluids	1	0.02	35.25
Machinery	26	0.40	35.65
Office machines – MePa goods	30	0.46	36.11
Office machines – MePa services	32	0.49	36.60
Marketing, communication, advertising, social media and market research	104	1.59	38.18
Electrical materials	25	0.38	38.56
Construction materials and minerals	24	0.37	38.93
Boats and accessories, maintenance and repair – MePa goods	21	0.32	39.25
Boats and accessories, maintenance and repair – MePa services	77	1.18	40.43
Chauffeur-driven vehicle rental (excluding health-care use)	117	1.79	42.21
Vehicle rental without driver	6	0.09	42.31
PCs, peripherals and accessories – MePa goods	156	2.38	44.69
PCs, peripherals and accessories – MePa services	25	0.38	45.07
Small laboratory equipment and materials	297	4.53	49.60
Small and large household appliances	6	0.09	49.69
Food products	62	0.95	50.64
Cemetery products	3	0.05	50.69
Cleaning products and equipment	8	0.12	50.81
Funeral products	1	0.02	50.82
Disposable products	24	0.37	51.19
Green maintenance and horticulture products	42	0.64	51.83
Waste collection products	3	0.05	51.88
Street cleaning and winter services	1	0.02	51.89
Personnel search and selection services	8	0.12	52.02
Environmental signage	21	0.32	52.34
Servers – MePa goods	4	0.06	52.40
Servers – MePa services	7	0.11	52.50
Cloud services	16	0.24	52.75
Insurance services	58	0.89	53.63
Commercial and collective catering services	49	0.75	54.38
Reception and concierge services	9	0.14	54.52
Event space setup services	19	0.29	54.81
Property administration services	1	0.02	54.82
Maintenance and repair of measuring and testing equipment	47	0.72	55.54
Maintenance and repair of electromedical equipment	63	0.96	56.50
Cemetery equipment maintenance services	1	0.02	56.52

(continued)

Table A3. Continued

Product category	Frequency	%	Cumulative
Musical equipment maintenance services	3	0.05	56.56
Sports equipment maintenance services	1	0.02	56.58
Management system certification services	2	0.03	56.61
Energy performance certification (APE) services	3	0.05	56.66
Energy diagnostics services	2	0.03	56.69
Pest control services	111	1.69	58.38
Internal logistics and warehousing services	91	1.39	59.77
Training services	190	2.90	62.67
Archive management services	14	0.21	62.89
Nonhazardous special waste management services	27	0.41	63.30
Hazardous special waste management services	27	0.41	63.71
Laundry services	31	0.47	64.18
Furniture maintenance services	7	0.11	64.29
Green area maintenance services	79	1.21	65.50
Maintenance, technical assistance and management services	36	0.55	66.05
Real estate brokerage services	4	0.06	66.11
Environmental monitoring services	66	1.01	67.11
Monitoring and validation services for health care and research facilities	1	0.02	67.13
Print management, digitization and document management services	5	0.08	67.21
Building cleaning services	21	0.32	67.53
Air-duct sanitation services	6	0.09	67.62
Occupational health surveillance services	43	0.66	68.27
Drainage services	11	0.17	68.44
Printing and graphic services	42	0.64	69.08
Specialized support services	252	3.85	72.93
Tele-assistance and tele-monitoring services	2	0.03	72.96
Telephony and connectivity services	4	0.06	73.02
Treasury and cash management services	6	0.09	73.11
Fire safety surveillance services	3	0.05	73.16
Active surveillance services	21	0.32	73.48
Nursing services	1	0.02	73.50
Legal and regulatory services	3	0.05	73.54
Postal collection and delivery services	6	0.09	73.63
Cultural heritage professional services	21	0.32	73.95
Architectural and related professional services	105	1.60	75.56
Actuarial professional services	19	0.29	75.85
Labor consultancy services	3	0.05	75.89
Safety coordination professional services	30	0.46	76.35
Engineering consultancy services	64	0.98	77.33
Road engineering and cadastral services	15	0.23	77.56
IT and telecommunications engineering services	1	0.02	77.57
Civil and industrial engineering design services	63	0.96	78.53
Urban planning and landscape architecture services	4	0.06	78.60
BIM model verification services	4	0.06	78.66
Engineering design verification services	23	0.35	79.01
Construction supervision services	5	0.08	79.08
Tax and fiscal advisory services	3	0.05	79.13
Environmental, landscape and forestry services	20	0.31	79.44
Architectural restoration services	1	0.02	79.45
Seismic vulnerability assessment and structural monitoring services	2	0.03	79.48

(continued)

Table A3. Continued

Product category	Frequency	%	Cumulative
Recreational, cultural, sports and event organization services	118	1.80	81.28
Social services	31	0.47	81.76
Technical services in architecture, engineering and planning	15	0.23	81.98
Tourism, hospitality and travel organization services	493	7.53	89.51
Catering services	1	0.02	89.53
Bar management services	24	0.37	89.89
Vending machine management services	175	2.67	92.56
Translation and interpretation services	13	0.20	92.76
Transcription services	1	0.02	92.78
Cybersecurity – MePa goods	5	0.08	92.85
Cybersecurity – MePa services	6	0.09	92.95
Integrated and convergent systems – MePa goods	3	0.05	92.99
Integrated and convergent systems – MePa services	1	0.02	93.01
Housing solutions and logistics facilities	8	0.12	93.13
Temporary employment services	9	0.14	93.27
Storage systems – MePa goods	2	0.03	93.30
Surgical instruments and dental devices	16	0.24	93.54
ICT support and consultancy services	77	1.18	94.72
Calibration of measuring instruments	12	0.18	94.90
Thermo-hydraulic services	4	0.06	94.96
Laboratory tests (excluding execution and certification)	46	0.70	95.66
Laboratory tests (including execution and certification)	3	0.05	95.71
Health-care vehicles	2	0.03	95.74
Vehicle equipment, accessories and maintenance – MePa services	96	1.47	97.21
Vehicle equipment, accessories and maintenance – MePa goods	68	1.04	98.24
Aircraft equipment and maintenance – MePa goods	6	0.09	98.34
Aircraft equipment and maintenance – MePa services	8	0.12	98.46
Electrical system inspections	19	0.29	98.75
Elevator inspections	10	0.15	98.90
Periodic inspection of work equipment	4	0.06	98.96
Glassware and disposables	18	0.27	99.24
Video surveillance, access control and intrusion systems – MePa goods	20	0.31	99.54
Video surveillance, access control and intrusion systems – MePa services	30	0.46	100.00
Total	6,550	100.00	

Source(s): Author's elaboration on CONSIP data

Table A4. Descriptive statistics

Variable	Obs.	Mean	SD	Min.	Max.
Number of contracts	6,550	1.835	3.404	1	102
RdO	6,550	0.449	0.497	0	1
Number of suppliers	6,550	1.412	1.489	1	49
Number of P.A.	6,550	1.068	0.309	1	6
Type MePa	6,550	1.612	0.487	1	2
Type P.A.	6,550	5.895	1.437	1	7
Product category (CPV)	6,550	87.467	51.6	1	181
Province P.A.	6,550	58.155	30.066	1	109
Region P.A.	6,550	9.97	5.053	1	20
Region supplier	6,550	19.129	9.317	1	37
Source(s): Author's elaboration					

Table A5. Pairwise correlation matrix

Variables	(1)	(2)	(3)	(4)
(1) n_contracts	1.000			
(2) RdO	−0.037	1.000		
(3) n_suppliers	0.086	−0.033	1.000	
(4) n_PA	0.179	−0.025	0.401	1.000
Source(s): Author's elaboration				

Table A6. NBREG estimated results

Variables	(7) NBREG <i>n_contracts</i>	(8) NBREG <i>n_contracts</i>	(9) NBREG <i>n_contracts</i>
RdO	0.140** (0.0550)	0.0764** (0.0388)	0.0616 (0.0248)
<i>n_suppliers</i>		0.253*** (0.0142)	0.250*** (0.0164)
RdO × <i>n_suppliers</i>			0.0154** (0.0035)
<i>n_PA</i>	0.827*** (0.0416)	0.205*** (0.0432)	0.206*** (0.0403)
Constant	−0.475*** (0.127)	−0.231*** (0.0860)	−0.225** (0.0944)
Type PA	Yes	Yes	Yes
Type MePa	Yes	Yes	Yes
Product category (CPV)	Yes	Yes	Yes
Region PA	Yes	Yes	Yes
Province PA	Yes	Yes	Yes
Region supplier	No	Yes	Yes
Observations	6,550	6,550	6,550
<i>Ina</i>	−1.478*** (0.0992)	−2.520*** (0.225)	−2.519*** (0.224)

Note(s): Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$

Table A7. IV estimated results

Variables	(10) Baseline IV <i>n_contracts</i>	(11) IV + controls <i>n_contracts</i>	(12) IV + controls + FE <i>n_contracts</i>
RdO	0.424*** (0.108)	0.160*** (0.045)	0.248** (0.125)
<i>n_suppliers</i>		2.029*** (0.137)	2.006*** (0.133)
RdO × <i>n_suppliers</i>			0.377* (0.201)
<i>n_PA</i>		−0.860*** (0.243)	−0.838*** (0.235)
Constant	2.091*** (0.077)	−0.037 (0.165)	−0.275 (0.199)
Type PA	No	Yes	Yes
Type MePa	No	Yes	Yes
Product category (CPV)	No	Yes	Yes
Region PA	No	No	Yes
Province PA	No	No	Yes
Region supplier	No	No	Yes
Observations	6,550	6,550	6,550
<i>R-squared</i>	0.001	0.737	0.747

Note(s): Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$

Appendix 3. Instrumental variable regression

To mitigate potential endogeneity in the adoption of the *RdO* procedure, we construct three instrumental variables that capture exogenous variation in procedural norms across comparable public administrations. Each instrument is based on a *leave-one-out* formulation that excludes the observation itself, thereby preventing mechanical correlation between the instrument and the error term.

The first instrument, $Z_i^{\text{RC-LOO}}$, measures the share of *RdO* procedures among other public administrations operating within the same region–category cell:

$$Z_i^{\text{RC-LOO}} = \frac{\sum_{j \neq i} D_j 1\{r_j = r_i, c_j = c_i\}}{\sum_{j \neq i} 1\{r_j = r_i, c_j = c_i\}}$$

where D_j indicates whether the observation j used *RdO*, r_j the region and c_j the MePa category. This variable captures localized procedural norms that arise from shared institutional environments and regional procurement practices.

The second instrument, $Z_i^{\text{CAT-OTHREG}}$, exploits variation in the average adoption rate of *RdO* within the same category but in other regions, thus isolating cross-regional differences in procedural behavior:

$$Z_i^{\text{CAT-OTHREG}} = \frac{\sum_j D_j 1\{c_j = c_i, r_j \neq r_i\}}{\sum_j 1\{c_j = c_i, r_j \neq r_i\}}$$

By excluding the local region, this measure is intended to reduce the role of region-specific shocks or governance characteristics that may be associated with both procedural choice and contracting outcomes.

Finally, the third instrument, $Z_i^{\text{PTC-LOO}}$, represents the leave-one-out share of *RdO* procedures among public administrations of the same institutional type (e.g. municipalities, ministries and universities) within the same category:

$$Z_i^{\text{PTC-LOO}} = \frac{\sum_{j \neq i} D_j 1\{p_j = p_i, c_j = c_i\}}{\sum_{j \neq i} 1\{p_j = p_i, c_j = c_i\}}$$

This variable captures procedural norms within similar institutional environments that face comparable legal and operational constraints. Together, these instruments exploit spatial and institutional heterogeneity in peer procedural behavior to predict an individual administration's likelihood of adopting *RdO*. Because the analysis is cross-sectional, identification relies on cross-sectional variation in peer norms rather than on temporal dynamics, ensuring that each instrument captures exogenous behavioral patterns across comparable administrative contexts.

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