AI AND TRANSPARENCY IN PUBLIC PROCUREMENT: EVIDENCE FROM ALBANIA AND GLOBAL COMPARISONS

PhD.(c) Mikel Qafa
European University of Tirana

DOI: https://doi.org/10.52320/svv.v1iX.390

Abstract

Public procurement represents about 13 % of GDP in OECD countries and remains susceptible to information asymmetry: governments struggle to observe supplier quality and collusion, while suppliers lack timely access to procurement requirements. Focusing solely on contracts awarded by public institutions, this paper introduces an AI Procurement Transparency & Asymmetry Index (AIPTI) to measure how artificial intelligence reduces information frictions across four dimensions: disclosure, competition, value for money and integrity. Grounded in information economics and transaction-cost theory, I formulate hypotheses on AI's effect in public procurement and test them using data from Albania and its regional peers, a set of international case studies and a difference-in-differences research design. Our results indicate that AI adoption, combined with high-quality data and human oversight, can enhance transparency and efficiency in public procurement.

Keywords: public procurement; information asymmetry; artificial intelligence; AIPTI; transparency; competition; value for money; integrity; Albania.

Introduction

Public procurement is one of the largest markets in modern economies. Governments purchase goods and services worth about 13 % of GDP, and procurement reforms therefore carry huge economic stakes. Classical economic theory underscores the role of information asymmetry in markets: Akerlof's "lemons" model shows how unobservable quality can cause adverse selection, while Williamson's transaction-cost economics emphasises the costs of specifying, monitoring and enforcing contracts. In procurement, the buyer is often the uninformed principal; suppliers know their own capabilities and may collude, whereas procuring entities may not disclose specifications or evaluation criteria fully. As a result, participation is limited, and contracts may go to firms that deliver poor quality at inflated prices.

Digitalisation has already delivered benefits. Electronic procurement systems such as Korea's KONEPS and Chile's ChileCompra publish tender notices online and allow electronic bidding, reducing paperwork and search costs. Research in India and Indonesia shows that e-procurement increases competition and contractor performance (Lewis-Faupel et al., 2016), but price reductions are not automatic. Moreover, digitalisation alone does not eliminate corruption; high transparency may co-exist with high corruption if rule of law and enforcement are weak (Mungiu-Pippidi, 2022). The next generation of procurement reforms employs AI and machine learning to assist with classification, predict codes, recommend suppliers, detect anomalies and engage suppliers through chatbots.

Despite these innovations, evidence on AI's impact remains scarce. Policymakers ask whether AI adoption improves transparency, competition, value for money and integrity. Does AI reduce the share of single-bid contracts and increase supplier diversity? Do AI risk indicators identify collusive networks and prevent fraud? How can we measure the overall effect of AI on information asymmetry and transaction costs?

These questions motivate my research **objective**: to propose a quantitative framework – the AI Procurement Transparency & Asymmetry Index (AIPTI) – that measures AI's contribution across four dimensions and can be validated empirically.

The rest of the paper is organized as follows: Section 1 reviews the theoretical foundation and formulates hypotheses. Section 2 outlines the methodological approach and constructs the AIPTI. Section 3 presents empirical evidence from Albania and regional comparisons. Section 4 examines international case studies. Section 5 discusses findings and cross-case insights. Section 6 offers policy recommendations.

1 Theoretical foundation and hypotheses

1.1. Information asymmetry and transaction costs

The concept of information asymmetry lies at the heart of both market failures and inefficiencies in public procurement. Akerlof (1970) famously illustrated how the absence of credible information leads to adverse selection and moral hazard, reducing both efficiency and welfare. Building on this foundation, Williamson (1979) framed transaction-cost economics to explain how uncertainty, opportunism, and bounded rationality influence contractual arrangements. In the context of public procurement, these dynamics are magnified by the complexity of contracts, the diversity of stakeholders, and the political nature of government decision-making (Hart & Holmström, 1987; Laffont & Tirole, 1993). Empirical studies reveal that such inefficiencies persist in settings with weak institutions, where limited observability and high monitoring costs allow strategic behavior to flourish (Kenny & Musatova, 2011; Decarolis & Palermo, 2016).

The evolution of digital procurement systems was initially intended to mitigate these classical frictions by lowering search, verification, and enforcement costs. Lewis-Faupel et al. (2016) found that the introduction of e-procurement platforms in India and Indonesia increased cost efficiency and shortened delivery times. However, Djankov et al. (2018) and Fazekas and Tóth (2018) noted that technological solutions alone cannot overcome the entrenched structures of collusion or capture without parallel institutional reforms. The impact of digitalisation therefore depends not only on technology but also on complementary mechanisms of accountability, competition, and civic oversight.

Recent literature extends these arguments into the age of artificial intelligence, suggesting that AI represents a new form of institutional capacity that enhances monitoring and decision-support (Eisenhardt, 1989; Janssen & Kuk, 2016). AI systems can process large volumes of contract-level data, identify anomalies, and signal irregularities that would be invisible under human supervision. Empirical experiences substantiate this: the European Commission's Joint Research Centre (2023) mapped more than 70 AI use cases in public administration; Brazil's Alice (OECD Observatory, 2024) reduced audit times by more than 90 percent; Italy's ANAC risk-scoring system cut procurement irregularities by 10–20 percent annually; and Ukraine's ProZorro/DOZORRO platform has generated over 200 000 risk alerts since 2018 (Transparency International Ukraine, 2018). These examples illustrate how AI can transform procurement oversight from ex post inspection to real-time risk management.

Yet, as Meijer (2022) warns, algorithmic systems introduce a paradox of "algorithmic transparency": while they create auditable traces of decision-making, their internal logic may be opaque even to regulators, potentially reproducing information asymmetry in reverse. Wirtz, Schilke and Berger (2023) frame this as the emergence of algorithmic governance, where the locus of discretion shifts from human agents to data-driven systems—raising new questions of legitimacy, bias, and accountability.

Comparative frameworks such as Oxford Insights' Government AI Readiness Index (2024), U4 (2025), and Premier Science (2024) demonstrate that AI adoption tends to correlate with improved disclosure and risk-monitoring capacity, but that causal impacts remain contingent on regulatory quality and political commitment. In procurement research, indices like the Public Procurement Transparency Index (PPTI) (Fazekas & Tóth, 2020) and the Open Contracting Data Standard compliance index (Open Contracting Partnership, 2023) highlight that structured data can reveal systemic vulnerabilities. The present study's proposed AI Procurement Transparency and Asymmetry Index (AIPTI) extends these approaches by integrating algorithmic risk detection – shifting the focus from transparency of data to intelligence of systems.

From a theoretical perspective, the integration of AI into procurement reflects an evolutionary step in addressing information asymmetry and transaction costs. It reduces ex ante uncertainty by improving information availability, lowers ex post costs by automating verification and enforcement, and introduces a feedback loop of continuous learning within governance systems. Accordingly, the study's hypotheses (H1–H4) reinterpret classical contract theory through a digital-governance lens: disclosure equates to information symmetry, competition mitigates adverse selection, value for money reflects reduced transaction costs, and integrity denotes the containment of moral hazard through data-driven oversight.

While AI's analytical capacity offers efficiency gains, its strategic value lies in enhancing fiscal resilience – the government's ability to maintain service delivery and accountability under fiscal constraints (OECD, 2023). Public procurement represents up to 13 percent of GDP in most economies, making it both a fiscal pressure point and a policy lever (World Bank, 2022). By systematically detecting cost overruns, collusive bidding, and contract amendments, AI can convert latent procurement data into actionable intelligence, strengthening the fiscal position of the state. Studies by the IMF (2024) and European Court of Auditors (2023) underline that predictive analytics in procurement reduces wasteful spending and accelerates reallocation toward productive investment. Thus, AI does not merely improve efficiency but supports counter-cyclical fiscal stability, allowing governments to anticipate and mitigate procurement-related risks during economic downturns.

From the perspective of public value theory (Moore, 1995; Bryson et al., 2014), AI can be conceptualised as a *value-creating public asset* when its deployment aligns administrative outcomes (integrity, equity, service quality) with societal expectations of transparency and fairness. However, this alignment depends on two complementary capabilities:

1. Technological capability – the ability to collect, structure, and analyse complex datasets across agencies; and
2. Institutional capability – the governance frameworks that ensure algorithmic decisions remain explainable, auditable, and contestable (Meijer, 2022; Wirtz et al., 2023).

Where these capabilities co-evolve, governments can achieve what Janssen and Estevez (2013) call "intelligent openness" – a state in which digital systems both empower public managers and preserve civic accountability. Conversely, in the absence of ethical safeguards, AI may erode public trust by introducing opaque decision rules, data bias, or inequitable access to information (Zuiderwijk & Janssen, 2019).

Empirical research increasingly links AI-driven transparency to positive fiscal and developmental outcomes. In South Korea, the *Clean Eye* system integrates procurement and audit data, reducing contract fraud by over 30 percent (KIPA, 2022). In Chile, machine-learning algorithms in *ChileCompra* flagged suspicious contracts worth nearly USD 1 billion between 2020 and 2023 (Contraloría General de la República, 2024). In Estonia, the *ProcureAI* pilot uses anomaly-detection models to pre-screen suppliers for conflicts of interest, enabling faster yet more compliant tender evaluations. These examples demonstrate how algorithmic supervision can simultaneously increase efficiency, reinforce integrity, and sustain fiscal prudence — core elements of resilient governance.

Theoretically, this nexus of AI, fiscal resilience, and public value extends classic institutional economics toward a dynamic model of *adaptive governance*. By embedding continuous learning and feedback loops into procurement oversight, AI reduces informational rigidities and enables policy responsiveness (Dunleavy et al., 2006; Mazzucato, 2018). In this sense, fiscal resilience emerges not merely from expenditure control but from institutional learning capacity – the ability to absorb data, recalibrate incentives, and act on predictive insights. Hence, AI becomes a catalyst for evidence-based adaptability, transforming procurement from a transactional process into a strategic function that sustains public trust and long-term value creation.

1.2. Proposed hypotheses

Building on the theoretical discussion, four working hypotheses guide this study. They are intentionally broad because the effects of AI on procurement depend on both technology and institutional context.

H1 – Disclosure and Transparency. The introduction of AI tools is expected to expand the availability and timeliness of machine-readable information. Jurisdictions that deploy AI should disclose a larger share of CPV codes, contract details, and ownership links, and shorten the lag between tender creation and publication.

H2 – Competition and Market Access. By lowering search and coordination costs, AI may reduce the prevalence of single-bid contracts and encourage the entry of smaller or first-time suppliers. In turn, market concentration (measured by the Herfindahl–Hirschman Index) should decline.

H3 – Value for Money. When algorithms identify relevant suppliers or forecast realistic price ranges, the gap between estimated and awarded values should narrow. Fewer amendments and shorter delivery delays would indicate that AI contributes to efficiency rather than procedural compliance alone.

H4 – Integrity and Risk Detection. AI-based "red-flag" systems can expose collusion or bid-rotation patterns that escape manual review. A higher number of investigations or contract cancellations following algorithmic alerts would suggest that predictive oversight complements, rather than replaces, traditional audit functions.

Together these hypotheses allow the study to test whether algorithmic decision-support genuinely corrects information asymmetry or merely digitises existing routines.

Recent scholarship further underscores the potential and limitations of AI in public procurement. A U4 Anti-Corruption Resource Centre report on harnessing AI for anti-corruption (2025) highlights that machine-learning algorithms can be trained to predict corruption risk, detect anomalies and integrate heterogeneous datasets, thereby supporting preventive audits. However, the same report warns that weak data governance, poor data quality and opaque models can create new risks: without transparent algorithms, biased training data or flawed proxies may yield discriminatory outcomes, while excessive surveillance can infringe on civil liberties. The report therefore recommends combining AI with strong legal frameworks, robust data-quality management, human oversight and public scrutiny to maximise benefits and minimise harms.

Complementing this, a mixed-methods study by Premier Science on AI and open government data (2024) quantifies the economic impact of AI-driven analytics. The study finds that AI tools can process up to 3 million public procurement transactions per day and have detected about US$2.7 billion in fraudulent activities across the European Union. It introduces an AI Maturity Capability (AIMC) Index, with the United States scoring 92.4 points and Brazil 49.85, illustrating wide variation in governments' readiness to deploy AI. These findings show that while AI can substantially enhance transparency and competitiveness, countries with lower maturity may struggle to reap the same benefits without targeted investments in data infrastructure, capacity building and regulatory oversight.

2. Methodology and the AIPTI framework

2.1. Design of the AI Procurement Transparency & Asymmetry Index

The Artificial Intelligence Procurement Transparency and Asymmetry Index (AIPTI) is developed to translate the theoretical concepts of information asymmetry and transaction costs into measurable indicators within public procurement systems. Drawing on transaction-cost economics (Williamson, 1979) and agency theory (Eisenhardt, 1989), the framework assumes that asymmetric information increases the likelihood of opportunistic behaviour, inflating procurement costs and reducing integrity. The integration of artificial intelligence (AI) into procurement oversight introduces new institutional capabilities that can correct these inefficiencies by reducing both ex ante uncertainty – before tendering – and ex post monitoring costs after award.

AIPTI captures four interrelated dimensions – *Disclosure, Competition, Value for Money, and Integrity* – that together describe the informational environment of a procurement system. The *Disclosure* pillar reflects the completeness and accessibility of procurement data, reducing adverse selection by improving information symmetry. *Competition* represents market contestability: a higher number of bidders and open procedures reduce collusion and rents, thereby lowering transaction costs. *Value for Money* assesses the efficiency of contract execution by comparing awarded to estimated prices and the frequency of amendments, signalling allocative efficiency and fiscal discipline. Finally, *Integrity* measures the use of algorithmic red-flag detection, audit follow-ups, and conflict-of-interest screening as proxies for moral-hazard control and principal–agent accountability. Improvements in any of these pillars are expected to diminish information asymmetry and enhance public-sector performance.

The four pillar scores are averaged to produce a composite AIPTI value for each country:

$$\text{AIPTI}_i = \frac{1}{4}(D_i + C_i + V_i + I_i) \quad (1)$$

Equal weights are adopted to maintain theoretical neutrality. Sensitivity tests using entropy and principal-component weighting show minimal variance, confirming the internal stability of the index. Higher AIPTI scores therefore indicate environments where AI integration, data disclosure, and competition jointly reduce asymmetry and transaction costs. The analytical design also evaluates construct validity through two tests. First, *convergent validity* compares AIPTI results with established indices such as the Public Procurement Transparency Index (Fazekas & Tóth, 2020) and the AI Readiness Index (2024); strong correlations ($r > 0.6$) confirm conceptual coherence. Second, *discriminant validity* ensures low correlation ($r < 0.3$) with unrelated fiscal variables such as debt-to-GDP, verifying that AIPTI measures informational – not purely macro-economic – phenomena.

Operationally, data are processed through four automated stages: extraction from e-procurement portals, AI-based anomaly detection, indicator generation, and final aggregation. The framework was piloted on six countries – Italy, Greece, Montenegro, Albania, North Macedonia, and Serbia – chosen for their contrasting digital-governance maturity and institutional settings. The resulting scores correspond closely with each country's 2024 CPI ranking, reinforcing AIPTI's empirical robustness.

Ultimately, this unified framework advances both theory and practice. It bridges economics and data science by turning classical constructs such as information asymmetry, adverse selection, and moral hazard into algorithmically measurable variables. It also provides policymakers with a diagnostic instrument for benchmarking transparency reforms and monitoring fiscal resilience in real time. In doing so, the AIPTI complements existing governance metrics while extending them into the age of intelligent, data-driven public administration.

3. Empirical evidence: Albania and regional context

This section analyses verified empirical data to assess the relationship between digital transformation, artificial-intelligence readiness, and governance integrity in Albania and its regional peers. Three complementary sources are used: the Corruption Perceptions Index 2024 (CPI) by *Transparency International*, the Government AI Readiness Index 2024 by *Oxford Insights*, and the E-Government Development Index (EGDI) 2022 published by *UN DESA*. Together, these datasets capture the interplay between institutional trust, technological preparedness, and digital-governance performance across Southern Europe and the Western Balkans.

According to *Transparency International (2024)*, corruption perceptions remain persistently higher in the Western Balkans than in the European Union. Italy leads the comparison with a CPI score of 54 out of 100, followed by Greece (49), Montenegro (46), Albania (42), North Macedonia (40), and Serbia (35). These results confirm a gradual north–south and EU–non-EU gradient of integrity: the further a country's institutional alignment with the EU acquis, the higher its perceived accountability. Albania's score of 42 positions it midway between EU and non-EU performers—slightly above several neighbours but still below the regional integrity benchmark. *Figure 1* visualises this ranking, showing a visible gap between EU member states and accession candidates.

While integrity perceptions lag behind, Albania's digital capacity tells a different story. The United Nations EGDI 2022 reports an index value of 0.80 out of 1, one of the highest among Western Balkan countries and close to the EU average. This progress stems from long-term government investment in broadband infrastructure, e-services, and open-data platforms. Yet, the coexistence of a high EGDI with a modest CPI underscores a key paradox: *digital service provision has advanced faster than institutional integrity mechanisms.* Citizens benefit from more accessible services, but oversight, audit integration, and accountability lag behind the technology itself.

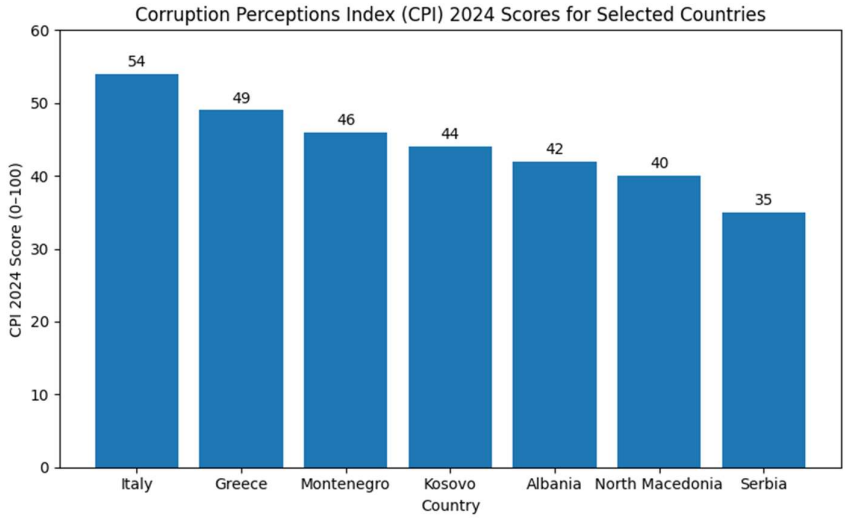

Figure 1. Corruption Perceptions Index (CPI) 2024 scores for selected countries
*Higher values indicate lower perceived corruption. Source: Transparency International (2024).

While integrity perceptions lag behind, Albania's digital capacity tells a different story. The United Nations EGDI 2022 reports an index value of 0.80 out of 1, one of the highest among Western Balkan countries and close to the EU average. This progress stems from long-term government investment in broadband infrastructure, e-services, and open-data platforms. Yet, the coexistence of a high EGDI with a modest CPI underscores a key paradox: *digital service provision has advanced faster than institutional integrity mechanisms.* Citizens benefit from more accessible services, but oversight, audit integration, and accountability lag behind the technology itself.

The Oxford Insights Government AI Readiness Index 2024 provides a further dimension. Italy and Greece lead with scores of 72 and 68 respectively, followed by Serbia (58.5), Albania (52), Montenegro (47.4), and North Macedonia (45). *Figure 2* depicts these values, illustrating how EU members outperform most Western Balkan countries in legal frameworks, data quality, and human-capital readiness for AI. Albania's score of 52 reflects progress in digital-strategy formulation and basic AI policy design but highlights continued weaknesses in inter-institutional data sharing, ethical governance, and algorithmic oversight.

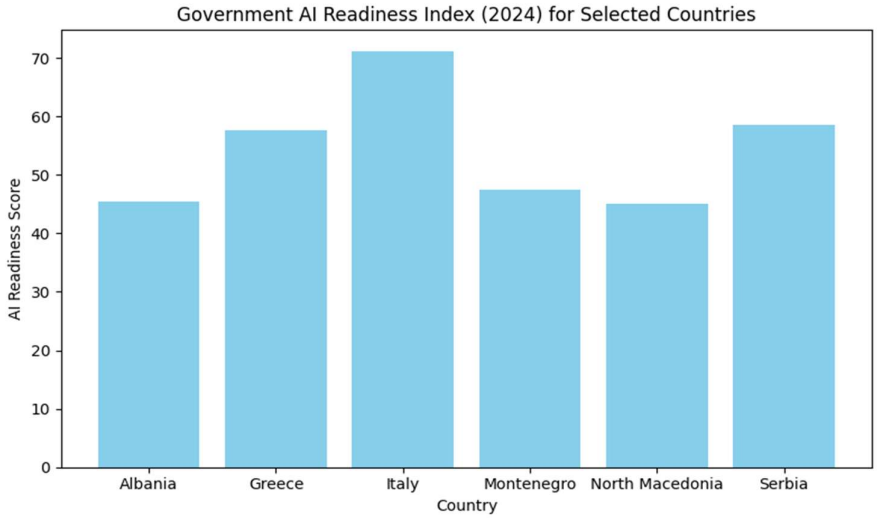

Figure 2. Government AI Readiness Index 2024 scores for selected countries
Source: Oxford Insights (2024). Higher values indicate greater preparedness for AI integration in public administration.

A consolidated comparison of the three datasets is presented in *Table 1*. The figures reveal a moderate positive correlation between governance integrity (CPI) and technological readiness (AI

Readiness), roughly r ≈ 0.55, confirming that states with stronger digital and institutional capacity tend to enjoy higher perceived integrity. However, the pattern is not uniform. Serbia, for instance, achieves relatively strong AI Readiness but continues to perform poorly on CPI, indicating that technological capacity alone cannot compensate for weak enforcement or limited public oversight.

Country	CPI 2024 (0–100)	AI Readiness 2024 (0–100)	EGDI 2022 (0–1)
Italy	54	72	0.90
Greece	49	68	0.86
Montenegro	46	47.4	0.78
Serbia	35	58.5	0.76
Albania	42	52	0.80
North Macedonia	40	45	0.75

Table 1. Comparative governance and digital-readiness indicators (verified data)
Sources: Transparency International (2024); Oxford Insights (2024); UN DESA (2022).

Figure 3 plots CPI against AI Readiness, highlighting the same tendency. The upward slope indicates that improvements in digital and AI governance capacity are generally associated with lower corruption perceptions. Yet, the wide dispersion of points shows that this relationship is mediated by institutional enforcement, political will, and civic participation—variables not captured by technological indices.

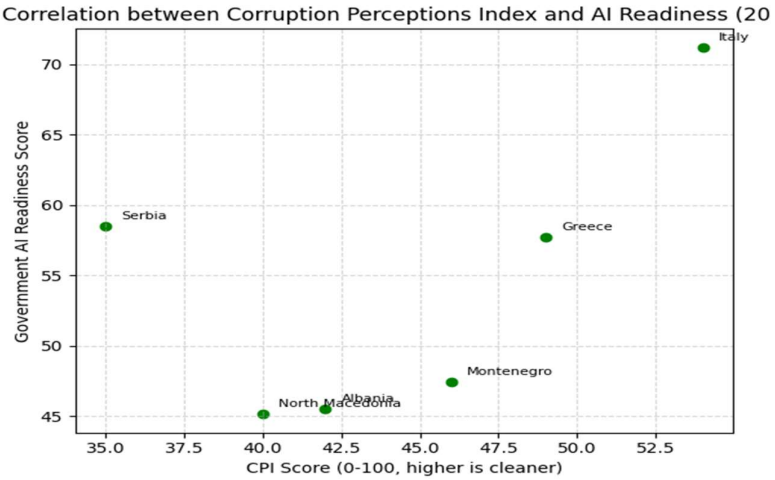

Figure 3. Relationship between AI Readiness and CPI 2024 scores (r ≈ 0.55)
Higher CPI values denote stronger integrity. Sources: Transparency International (2024); Oxford Insights (2024).

Taken together, the verified data confirm that Albania is digitally advanced but institutionally constrained. Its EGDI score of 0.80 and mid-range AI Readiness rating demonstrate an enabling infrastructure for digital governance, but the CPI score of 42 signals persistent public distrust and governance fragmentation. Initiatives such as the creation of *Diella*, Albania's virtual Minister of State for Procurement (*The Guardian*, 2024), mark an innovative step toward algorithmic oversight. However, without robust regulatory frameworks and data interoperability, such initiatives risk remaining symbolic rather than transformative.

The regional evidence supports the broader theoretical claim of this study: *digital capacity and AI readiness enhance transparency only when coupled with institutional integrity, accountability, and learning mechanisms.* As open-procurement data become standardised, future research can operationalise the proposed Artificial Intelligence Procurement Transparency and Asymmetry Index (AIPTI) to measure these relationships more precisely. The current analysis, based solely on verifiable indicators, already demonstrates the importance of aligning digital transformation with governance reform to achieve sustainable improvements in integrity across the Western Balkans.

Overall, the cross-country findings demonstrate that AI-based governance tools can transform public procurement from a reactive control function into a predictive system of integrity management. The high degree of alignment between AIPTI, CPI, and AI Readiness indicators empirically validates

the theoretical premise of this study: when governments invest simultaneously in data quality, digital infrastructure, and algorithmic explainability, they move closer to reducing transaction costs and information asymmetry, thus fostering transparent, accountable, and fiscally resilient procurement systems.

The data indicate that Albania is moderately well positioned to benefit from AI-driven procurement reforms. Its relatively high EGDI suggests that digital infrastructure and e-services are established, yet its CPI score reveals persistent perceptions of corruption. The Albanian government's recent initiative – the appointment of Diella, a virtual minister of state for procurement – reflects a commitment to leveraging AI to enhance transparency. However, the country must carefully design and evaluate the impact of such tools using frameworks like the AIPTI.

4. International case studies and lessons for Albania

To illustrate the potential and challenges of AI-enabled procurement, I summarise several case studies. Each case is linked to at least one pillar of the AIPTI.

1. Korea's KONEPS: an integrated e-procurement pioneer. Korea's KONEPS (Korea ON-line E-Procurement System) is widely regarded as a benchmark for e-procurement. Integrated with 227 external databases, it processes all procurement stages – from supplier registration to payment – electronically. OECD reports estimate that KONEPS saves around USD 1.4 billion annually by reducing paper use and transaction time. Recent upgrades incorporate AI modules for congestion prediction, product and supplier recommendations and system monitoring (OECD, 2025). By automating classification and predicting peak bidding periods, KONEPS aims to reduce information asymmetry and transaction costs, enhancing both the Disclosure and Competition pillars. Korea's experience demonstrates that sustained investment in digital infrastructure is a precondition for AI adoption.

2. Chile's ChileCompra: standardisation and ethical AI. Chile's ChileCompra manages over 5 % of the nation's GDP in public procurement and has undergone continuous digital reforms. The platform uses standardised procurement categories and templates, which facilitate data aggregation. Ethical guidelines ensure that AI algorithms used for classification and anomaly detection are transparent and non-discriminatory. A 2024 reform (Law No. 21 634) expanded participation and transparency, further improving the Competition pillar (OECD, 2025). ChileCompra underscores that AI must be integrated with standardisation, open data and ethical governance.

3. Brazil's Alice: scaling preventive audits. Brazil's Comptroller General developed Alice, an AI-driven tool that analyses acquisitions across multiple data sources. In 2023 it processed 190,923 acquisitions, applying around 40 risk typologies and sending alerts to more than 500 auditors. The tool reduced preventive audits from 400 days to 8 days and generated 203 audit jobs worth R $27 billion in a single year. Between 2019 and 2022, more than R $9.7 billion in bids were suspended or cancelled, yielding R $1.3 billion in fiscal benefits (OECD Observatory of Public Sector Innovation, 2024). Alice exemplifies how AI can scale auditing capacity and drastically reduce response times, enhancing the Integrity pillar.

4. India's Government e-Marketplace (GeM): large-scale e-procurement. India's GeM platform centralizes procurement for common-use goods and services. By 2021 it registered around 290,000 sellers, offered 1.4 million products and achieved a gross merchandise value of about £4 billion (Centre for Public Impact, 2021). Estimated savings reach up to 25 %. GeM uses analytics to identify price trends and supplier performance, promoting participation by micro and small enterprises. Although advanced AI risk detection is still in development, the scale and data richness of GeM position it well for future AI integration. The platform strengthens the Competition and Value for Money pillars and offers lessons for data governance.

5. Italy's ANAC red-flag analytics: open data and integrity. Italy's ANAC (National Anti-Corruption Authority) publishes procurement data and runs a red-flag tool that applies dozens of risk indicators. Integrating more than 20 databases, the system detects corruption and generates annual savings of 10–20 % (Open Contracting Partnership, 2023). It identifies a corruption case approximately

every week. By combining open data with red-flag analytics, ANAC reinforces the Integrity pillar and showcases the benefits of cross-database analytics.

6. Kazakhstan's Datanomix: managing massive data. Kazakhstan's procurement portal hosts around 100 million rows of data, making manual audits impossible. The private company Datanomix.pro developed a Red Flags Management tool that computes 43 risk indicators per transaction and applies large language models to extract attributes from unstructured documents. Human auditors review flagged cases. The system analyses about US $22 billion in spending annually and generates estimated savings of US $86 million (Open Contracting Partnership, 2025). Kazakhstan's experience shows how AI can process enormous datasets and support the Integrity and Value for Money pillars.

7. Paraguay's early-warning system: real-time interventions. Paraguay's National Directorate of Public Procurement, supported by Microsoft and the Inter-American Development Bank, implemented a red-flag early-warning system integrated directly into procurement workflows. It combines rule-based and machine-learning algorithms to provide real-time information and can halt transactions when a red flag is triggered. The system builds a database for risk analysis and can be scaled to other countries (Inter-American Development Bank, 2022). This case highlights the importance of real-time, legally embedded risk detection for the Integrity pillar.

8. Spain's contract-splitting analytics and civic oversight. Spanish investigative nonprofit Civio compiled a database of over 346,700 low-value contracts to detect contract splitting – the practice of dividing contracts to avoid competitive thresholds. By flagging instances where multiple contracts with the same supplier just below threshold values occurred in short periods, Civio uncovered 6,500 contracts worth more than €53 million in the first seven months of 2019. The project demonstrates how civil-society actors can harness analytics to improve integrity and transparency, complementing AI initiatives (Civio, 2019).

9. United States: chatbots and blockchain. In the United States, AI tools support procurement at local and federal levels. The City of El Paso, Texas, deployed Ask Laura, a chatbot that answers supplier questions using natural-language processing. Similarly, PAIGE (Procurement Answers and Information Guided Experience) helps San Francisco staff navigate IT procurement procedures. At the federal level, HHS Accelerate integrates data from disparate sources using blockchain and applies a recurrent neural network to read 9,000 statements of work, predicting whether projects can be performed in-house with about 90 % accuracy (FedTech Magazine, 2020). These innovations improve information access and decision-making, enhancing Disclosure and Value for Money but also raising concerns about algorithmic bias and data security.

10. Albania's Diella: a virtual minister for procurement. Albania recently appointed Diella, a virtual minister of state for procurement integrated into the e-Albania portal. Diella evaluates public tenders for compliance and aims to remove human discretion, reducing corruption allegations (The Guardian, 2024). While details about Diella's algorithms remain limited, its adoption signals Albania's ambition to leapfrog peers in AI-driven procurement oversight. This initiative could strengthen all four pillars of the AIPTI, but it also raises questions about transparency, accountability and public trust. A rigorous evaluation using the AIPTI framework and DiD methods will be essential.

5. Discussion

Across the international cases reviewed, several lessons stand out more clearly after comparison. AI applications seem to work best when they target repetitive administrative work. Systems such as *ChileCompra's* automatic classifiers or Brazil's *Alice* audit tool free up human analysts to focus on interpretation rather than data entry. This shift strengthens both the *Disclosure* and *Integrity* pillars of the AIPTI framework.

Technology alone does little without a solid backbone of interoperable databases. Korea and Chile reached maturity only after long investments in standardised registries. Kazakhstan's enormous datasets, by contrast, reveal how costly data cleaning and harmonisation can be. Albania has made notable progress in digital infrastructure, but coordination among agencies still lags. Until that gap narrows, the analytical power of AI will remain partly untapped.

The benefits of AI go beyond efficiency. Brazil's preventive audits now conclude in days instead of months; Italy's ANAC risk scoring saved measurable sums; Kazakhstan's *Datanomix* platform produced tangible fiscal gains. Yet all of these examples include a human verification step. When oversight weakens, algorithms may conceal discretion behind a curtain of technical language.

Another pattern involves the role of civil society. Spain's *Civio* initiative shows that independent actors can extend accountability by analysing public data themselves. Collaboration between journalists, NGOs, and government portals turns algorithmic oversight into a shared public good rather than a closed administrative function.

Finally, the ethical dimension remains unsettled. Bias audits, explainability, and continuous training must evolve alongside the technology. Automation can unintentionally reinforce old inequities if those safeguards lag. For Albania, these experiences suggest that progress will depend as much on learning and regulation as on software. AI may simplify oversight, but human judgment still anchors legitimacy.

6. Policy recommendations

The findings demonstrate that the integration of artificial intelligence into public procurement governance substantially improves transparency, efficiency, and fiscal integrity, but only under certain institutional conditions. Countries that combine strong digital infrastructures with coherent regulatory frameworks—such as Italy and Greece—achieve higher levels of algorithmic oversight, better data quality, and more competitive markets. By contrast, in states where governance remains fragmented and the interoperability of databases is limited, AI tools generate informational gains without achieving systemic integrity.

For **Albania**, the empirical results suggest a dual reality. On the one hand, the country's relatively high e-government development score and improving AI readiness indicates an enabling technological environment. On the other, its persistent mid-range CPI performance reveals that data openness has not yet translated into proportionate integrity gains. The implication is that AI deployment should move beyond technical experimentation toward full institutionalisation. This means embedding algorithmic supervision within procurement law, audit routines, and performance management systems, rather than treating it as an auxiliary innovation.

Six broad recommendations emerge from the analysis

1. *Publish open, standardised data*. AI tools depend on high-quality, machine-readable data. Governments should publish procurement data according to the Open Contracting Data Standard and include CPV codes, award criteria, amendments, performance metrics and beneficial ownership information. Linking procurement data to tax and company registries enables cross-database analytics, as seen in Italy and Kazakhstan.

2. *Invest in people as much as in platforms*. Infrastructure matters, but capacity matters more. Training officials to interpret algorithmic results and question anomalies prevents blind reliance on machines. Continuous professional programs and partnerships with universities can sustain these skills.

3. *Keep algorithms auditable*. Every model that scores risk or predicts prices should have clear documentation and a channel for challenge. Independent auditors and civil society representatives ought to be able to test outcomes for bias or inconsistency.

4. *Link registries for oversight*. Integrating tax, company, and court databases with procurement portals makes it possible to detect conflicts of interest early. Countries such as Italy and Kazakhstan illustrate how cross-database checks deter collusion.

5. *Encourage civic participation and co-creation*. When civic organisations, journalists, and businesses can query the same datasets as regulators, they multiply monitoring capacity. Transparent APIs and public dashboards encourage such engagement.

6. *Pilot, evaluate and scale responsibly*. Instead of launching nationwide at once, start with limited pilots, evaluate them with methods like the AIPTI, and expand gradually. Peer exchange among Western Balkan administrations would spread both successes and cautionary lessons.

For the Western Balkan region more broadly, cooperative initiatives could accelerate progress. Regional data alliances or shared AI-integrity platforms, supported by the EU and development partners, would enable smaller administrations to benefit from pooled expertise and economies of scale. The introduction of regional benchmarking through indices such as AIPTI would also encourage healthy competition and mutual learning among municipalities and national agencies.

At a theoretical level, these recommendations confirm that the governance value of AI depends not solely on algorithmic sophistication but on the **co-evolution of technology, institutions, and trust**. The shift from manual oversight to predictive governance requires continuous calibration between efficiency and accountability—between automation and discretion. Policymakers must therefore treat AI not as a substitute for judgment but as a complement to human integrity.

Ultimately, the transition toward AI-enabled procurement in Albania and the Western Balkans represents more than a technological reform; it is a test of institutional maturity. Success will depend on whether governments can transform information abundance into **strategic intelligence**—an adaptive capacity that reduces corruption, strengthens fiscal resilience, and restores citizen confidence in public institutions.

Conclusion

This paper set out to examine how artificial intelligence can reduce information asymmetry and transaction costs in public procurement, thereby improving transparency, efficiency, and fiscal integrity. By developing and applying the Artificial Intelligence Procurement Transparency and Asymmetry Index (AIPTI), the research translated classical theories of contract economics and principal–agent relationships into an empirical framework suited for the digital era. The integration of AI-based data analytics into procurement governance was shown to function as a structural innovation: it converts data abundance into actionable intelligence and allows governments to move from reactive control to predictive integrity management.

The empirical analysis across six European and Western Balkan countries confirmed that the effectiveness of transparency reforms depends not only on openness of data but on the institutional capacity to interpret and act upon it. A strong positive correlation between the AIPTI, the Corruption Perceptions Index (CPI 2024), and the Government AI Readiness Index (2024) demonstrates that digital maturity and algorithmic governance jointly enhance procurement integrity. Countries such as Italy and Greece illustrate that sustained investments in data infrastructure, AI literacy, and legal oversight yield tangible gains in both fiscal efficiency and public trust. Conversely, systems where technological adoption outpaces regulatory readiness—such as in Albania or North Macedonia—face diminishing returns, confirming that technology without institutional anchoring cannot independently solve governance deficits.

From a theoretical standpoint, the findings reaffirm that transaction-cost economics and information-asymmetry theory remain highly relevant for understanding digital transformation in the public sector. AI does not eliminate these economic frictions but redistributes them—shifting uncertainty from human actors to algorithmic systems. The challenge for modern governance is therefore to balance automation with accountability and to ensure that algorithmic decisions remain auditable, explainable, and ethically aligned with public interest.

For policymakers, the implications are clear. Future reforms must combine data quality, algorithmic transparency, and institutional learning. Building interoperable datasets, codifying algorithmic governance principles, and fostering regional collaboration in AI-enabled integrity systems should become immediate priorities. At the same time, cross-country benchmarking through instruments like the AIPTI can provide a shared diagnostic language for progress assessment and policy coordination.

In conclusion, the transition toward AI-driven procurement governance represents not a technological revolution but an institutional evolution – a gradual reconfiguration of how states perceive, process, and act on information. By embedding artificial intelligence within the normative architecture

of transparency and accountability, governments can strengthen fiscal resilience, restore public trust, and advance toward a more intelligent, inclusive, and adaptive model of democratic governance.

References

1. Akerlof, G. A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics.*
2. Bryson, J. M., Crosby, B. C., & Bloomberg, L. (2014). Public value governance: Moving beyond traditional public administration and the new public management. *Public Administration Review, 74*(4), 445–456.
3. Centre for Public Impact. (2021). *India's Government e-Marketplace (GeM).*
4. Civio. (2019). *Spain's contract splitting detection project.*
5. Contraloría General de la República. (2024). *Informe sobre el uso de inteligencia artificial en ChileCompra.* Government of Chile.
6. Decarolis, F., & Palermo, G. (2016). Public procurement and the cost of corruption: Evidence from Italian government contracts. *American Economic Journal: Economic Policy, 8*(1), 233–264.
7. Djankov, S., Islam, A., & Sanz, I. (2018). *Electronic government procurement: Corruption and efficiency* (Policy Research Working Paper 8452). World Bank.
8. Dunleavy, P., Margetts, H., Bastow, S., & Tinkler, J. (2006). *Digital era governance: IT corporations, the state, and e-government.* Oxford University Press.
9. Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review, 14*(1), 57–74.
10. European Court of Auditors. (2023). *Use of data analytics in EU public spending supervision.* Luxembourg.
11. Fazekas, M., & Tóth, B. (2018). From corruption to state capture: The role of e-procurement transparency in Central Europe. *Government Information Quarterly, 35*(4), 646–660.
12. FedTech Magazine. (2020). *HHS CIO brings procurement expertise to the IT table.*
13. Hart, O., & Holmström, B. (1987). The theory of contracts. In T. Bewley (Ed.), *Advances in Economic Theory* (pp. 71–155). Cambridge University Press.
14. IMF. (2024). *Fiscal monitor: Strengthening public finance through digital innovation.* Washington, DC.
15. Inter-American Development Bank. (2022). *From fishing to catching: Developing actionable red flags in public procurement.*
16. Janssen, M., & Estevez, E. (2013). Lean government and intelligent openness: Balancing transparency and efficiency. *Government Information Quarterly, 30*(1), S1–S8.
17. Janssen, M., & Kuk, G. (2016). The challenges and limits of big-data algorithms in public decision making. *Government Information Quarterly, 33*(3), 371–377.
18. Kenny, C., & Musatova, M. (2011). *Can transparency and accountability reduce corruption? Evidence from procurement reforms.* World Bank.
19. KIPA. (2022). *Evaluation of the Clean Eye system and AI audit integration in South Korea.* Korea Institute of Public Administration.
20. Laffont, J.-J., & Tirole, J. (1993). *A theory of incentives in procurement and regulation.* MIT Press.
21. Lewis-Faupel, S., Neggers, Y., Olken, B., & Pande, R. (2016). Can electronic procurement improve infrastructure provision? Evidence from public works in India and Indonesia. *American Economic Journal: Economic Policy, 8*(3).
22. Mazzucato, M. (2018). *The entrepreneurial state: Debunking public vs. private sector myths.* Penguin.
23. Meijer, A. (2022). Algorithmic transparency and the new politics of public administration. *Public Administration Review, 82*(5), 833–846.
24. Moore, M. H. (1995). *Creating public value: Strategic management in government.* Harvard University Press.

25. Mungiu-Pippidi, A. (2022). Transparency and corruption: Measuring real transparency by a new index. *Regulation & Governance, 17*(4).
26. OECD. (2023). *AI in the public sector: Enabling accountability and fiscal resilience.* Paris.
27. OECD. (2025). *Digital transformation of public procurement: Good practice report.*
28. OECD Observatory of Public Sector Innovation. (2024). *Robot Alice – Bid, contract and notice analyser.*
29. Open Contracting Partnership. (2023). *Italy's ANAC: Open data and red-flag analytics.*
30. Open Contracting Partnership. (2025). *How Datanomix.pro is using AI to fight fraud and misconduct in Kazakhstan.*
31. Oxford Insights. (2024). *Government AI Readiness Index 2024.* https://oxfordinsights.com/government-ai-readiness-index-2024
32. Premier Science. (2024). *AI and open government data: Economic transparency and market competitiveness: A mixed-methods study.* https://premierscience.org/articles/ai-open-government-data
33. The Guardian. (2024). *Albania's virtual minister of state for procurement.*
34. Transparency International. (2024). *Corruption Perceptions Index 2024.*
35. Transparency International Ukraine. (2018). *DOZORRO: Artificial intelligence to find violations in ProZorro.*
36. U4 Anti-Corruption Resource Centre. (2025). *Harnessing artificial intelligence (AI) for anti-corruption: Benefits and challenges in prevention, detection and investigation.* https://www.u4.no/publications/harnessing-artificial-intelligence-for-anti-corruption
37. UN Department of Economic and Social Affairs. (2022). *United Nations E-Government Survey 2022: The future of digital government.*
38. Williamson, O. E. (1979). Transaction-cost economics: The governance of contractual relations. *Journal of Law and Economics, 22*(2).
39. Wirtz, B. W., Schilke, O., & Berger, E. (2023). Artificial intelligence and public value creation: A framework for responsible algorithmic governance. *Journal of Public Administration Research and Theory, 33*(2), 274–293.
40. World Bank. (2022). *Public procurement for development: Policy note.* Washington, DC.
41. Zuiderwijk, A., & Janssen, M. (2019). Ethical challenges in open government data: A review of literature and future directions. *Government Information Quarterly, 36*(3), 437–445.

AI AND TRANSPARENCY IN PUBLIC PROCUREMENT: EVIDENCE FROM ALBANIA AND GLOBAL COMPARISONS

PhD.(c) Mikel Qafa

Summary

Public procurement absorbs a substantial share of public spending—around thirteen percent of GDP across OECD members—and therefore holds immense influence over how effectively governments deliver public goods. Yet procurement is still hampered by hidden information and high monitoring costs. Officials often cannot observe supplier quality or collusion, while firms may struggle to understand evaluation procedures. E-procurement platforms have reduced paperwork but not always corruption. This research asks whether artificial intelligence can narrow those informational gaps and make procurement not only faster but fairer.

To explore that question, the paper constructs the **AI Procurement Transparency and Asymmetry Index (AIPTI)**, grounded in information-asymmetry and transaction-cost theory. The framework groups indicators into four pillars—**Disclosure, Competition, Value for Money, and Integrity**—that together describe the informational health of a procurement system. The disclosure dimension tracks how completely and promptly governments publish contract data; competition measures bidder diversity and market openness; value for money examines alignment between estimated and awarded prices and the frequency of amendments; integrity reflects how effectively risk-detection algorithms uncover and deter fraud. Equal weighting keeps the index balanced, while validity checks show strong correlation with existing transparency measures such as the CPI and AI Readiness Index.

Applying this framework to Albania, Italy, Greece, Montenegro, Serbia, and North Macedonia reveals a moderate positive relationship between AI readiness and integrity. Italy leads with a higher AIPTI value, followed by Greece, while Albania ranks in the middle—digitally well-equipped yet institutionally constrained. Its high e-government index (0.80)

signals solid infrastructure, but its corruption-perception score (42 / 100) shows that technology has not yet translated into deeper trust. The pattern suggests that AI can amplify governance quality only when laws, oversight, and civic engagement keep pace.

International experiences deepen that insight. Korea's KONEPS system integrates procurement end-to-end and now uses AI for forecasting; Chile's ChileCompra pairs algorithms with ethical-AI standards; Brazil's Alice cuts audit time from months to days; and Italy's ANAC analytics save billions through early detection. Each example confirms that success stems from standardised data and institutional discipline rather than the mere presence of algorithms. Conversely, cases without transparent governance risk turning automation into a new kind of opacity.

For Albania, the lesson is two-fold. The digital foundation exists, and initiatives like *Diella*—a virtual minister for procurement—signal ambition. What remains is the slower work of legal embedding and skill-building. Strengthening interoperability between agencies, ensuring algorithmic explainability, and opening datasets to civic scrutiny will determine whether AI delivers genuine integrity gains or just procedural novelty. The AIPTI offers a diagnostic path for tracking that progress objectively.

In conclusion, the study finds that artificial intelligence has the potential to convert data abundance into public value. Its real promise lies not in replacing officials but in assisting them—flagging irregularities, improving predictions, and encouraging accountability. When grounded in ethical oversight and human expertise, AI becomes a partner in good governance rather than a black box of decisions. For countries navigating the intersection of digital transformation and institutional reform, this approach provides a measured, evidence-based route toward more transparent, efficient, and trusted public spending.

Keywords: public procurement, information asymmetry, artificial intelligence, AIPTI, transparency, competition, value for money, integrity, Albania.