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Intergovernmental Relations and the Challenges of Power Devolution: Federalism in Nepal

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Abstract: This study investigates the complexities and obstacles associated with intergovernmental relations (IGR) in Nepal's emerging federal system. By conducting interviews with government officials and analysing key IGR mechanisms, the research identifies substantial obstacles to the effective cooperation, coordination and coexistence of federal, provincial and local governments. Some of the significant issues are a lack of genuine autonomy for subnational entities, fiscal imbalances, inactive dispute resolution bodies and an ambiguous division of responsibilities. The study uses a qualitative approach, analysing authority, resources and responsibilities in Nepal through 29 key informant interviews with government officials. It identifies themes related to coordination, power devolution and service delivery, and uses secondary sources to contextualise Nepal's federal experiment within broader theoretical and comparative contexts. The study reveals that centralised control, political interference and ineffective institutions continue to hinder Nepal's IGR framework, despite the constitutional provisions. The findings have significant implications for federal governance in Nepal, emphasising the necessity of overcoming structural obstacles, promoting genuine collaboration among government echelons, and empowering subnational entities. More broadly, the study contributes to the literature on federalism and IGR in developing democracies by illustrating the difficulties associated with translating constitutional principles into functional multi-level governance systems.

Keywords: constitution, intergovernmental relations (IGR), federalism, local government, Nepal

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1. Introduction

Federalism balances power between central and subnational governments and relies on intergovernmental relations (IGR) for coordination and cooperation. While IGR promotes collaborative governance and decentralisation, gaps persist in practice, particularly in developing federal systems like Nepal.

In Nepal, the knowledge gap in IGR comes from confusion about the roles, responsibilities and power-sharing among federal, provincial and local governments. The confusion in legal areas, money rules and admin setups has made it tough to put the 2015 Constitution into action, which focuses on teamwork and coordination (Acharya, 2021). Studies highlight problems in structure, especially with intergovernmental groups such as the Constitutional Bench and the Interprovincial Council (Subedi, 2021).

The federal government is hesitant to share power, and the persistence of remnants of a unitary system has created a culture of dependency among local and provincial officials (Adhikari & Upadhyaya, 2020). This situation has made IGR institutions less effective, leading to poor service delivery, mismanaged resources and weak implementation of important laws. Research shows these issues, pointing out political manipulation and collusion among various levels of government (Acharya, 2021). The range of real-world studies on how these institutions operate is still quite limited.

To enhance the effectiveness of existing IGR structures in Nepal, there is an urgent need for comprehensive research from both the governmental and academic sectors. It will be necessary to examine institutional complexities, the persistence of a centralised mindset that controls devolution of authority, and bureaucratic tendencies that support authoritarianism, which are countervailing factors for effective IGR functioning (Subedi, 2025). A combination of these factors hinders the effective implementation of the constitutionally provided powers, functions and responsibilities of provincial and local governments. Moreover, research is urgently needed to assess the effectiveness of formal and informal IGR mechanisms, such as irregularities in organising meetings and *ad hoc* decision-making processes, political culture, leadership dynamics and bureaucratic behaviour, which have been significant in other federal systems like the USA and Germany (Cameron & Simeon, 2000; Hachard, 2022).

The implementation of federalism in Nepal has reached a critical juncture since IGR are influenced by various factors including the country's political economy, functional responsibilities, distribution of resources, political culture and leadership traits, administrative and technical capacity, the function of different tiers of government, social diversity, political parties and the electoral system, the status of democracy and good governance across all levels, as well as the overall working environment, institutional capacity and the service delivery system (Agranoff, 2011). To maximise the benefits of the new federal structure, it is necessary that the IGR operationalise effectively, free from political interference or manipulation, and focus on empowering provincial and local governments.

Previous studies have mostly looked at federations that are well-established, but this article looks at how IGR was set up in Nepal very early on. It fills in a very important gap in our knowledge of how developing countries deal with political, administrative and

financial problems. It also fits with ongoing worries about division, power sharing, and how well governments work in states that are transitioning to federalism or have just become federalised. This study investigates the hurdles facing federalism in Nepal, especially the intergovernmental interactions that block the smooth operation of federal, provincial and municipal bodies. Even with the creation of institutions like the Constitutional Bench and Interprovincial Council to set up the federal system, these groups find it tough to tackle issues around politics, administration, jurisdiction and funding. The system's problems get worse because the legislature, administration and judiciary all have their own agendas. There is also a culture of collusion and weak ties with local governments that make things even tougher. Also, a shaky political culture, clashing interests among stakeholders, bureaucratic aims and actors who cannot accept change are allocating resources and planning, resulting in ineffective interactions between governments.

2. Understanding the structural barriers of IGR: A brief literature review

The Comprehensive Peace Accord of 2006, together with the Madhesh Movement of 2015 and other identity-based movements advocating for greater inclusion, laid the foundation for the promulgation of Nepal's new constitution in 2015 (Acharya, 2018). Departing from the traditional monarchy, the new constitution established a Westminster-based, inclusive federal governance system. To facilitate local development, integrate diverse sectoral programs, mainstream specialised functions, promote local economic growth and harness natural resources, the constitutional framework introduced a system of IGR among the three tiers of government. This system envisions a collaborative partnership between state institutions and local communities for driving grassroots development (Subedi, 2021). The Government of Nepal, however, did not establish a federalism implementation plan, designed and coordinated by a high-level commission of experts. Such a body could have played a crucial role in setting a clear timeline for the reform rollout and in guiding the government toward a more effective sequence of reforms (Bhal et al., 2022). In addition, the government also failed to ensure the availability of essential data and information required to monitor economic development, assess expenditure needs and evaluate fiscal performance. These two major lessons were impeded by a lack of political commitment and the reluctance of its bureaucracy to fully adopt constitutional mandates (Acharya, 2021). This hesitancy continues to impede the effective implementation and functioning of IGR in Nepal.

In countries where federalism has been implemented, IGR has been extensively studied, and these studies have been critical in shaping the understanding of both federalism theory and practice. In contrast, Nepal, despite adopting a federal system in 2015 through the promulgation of its new constitution, continues to face a significant gap in scholarly and policy-oriented documentation on IGR (Rai, 2025). Although some preliminary initiatives have been undertaken by the government and development partners, these efforts have not sufficiently addressed the pressing need for comprehensive and systematic research. Existing studies in the Nepali context have largely concentrated on the political,

administrative and fiscal dimensions of federalism, often adhering to procedural approaches to the formulation of policies, programs and legislative frameworks (Acharya, 2021). The scarcity of comprehensive and empirically grounded resources has further limited academic investigations, each of which has consequently remained narrowly focused on formal, process-oriented themes. A notable absence of serious and in-depth studies on IGR mechanisms persists, particularly regarding how these systems function in practice within Nepal's emerging federal structure (DRCN, 2020). This research gap is rooted in a dominant narrative that conceptualises IGR mechanisms merely as routine bureaucratic processes within public administrations, rather than a function of cooperative federalism. As a result, little effort has been made to collect empirical evidence or to critically assess the functionality and effectiveness of these mechanisms. Despite increased citizen access to government services under the federal system, the credibility and functionality of constitutionally mandated IGR mechanisms are increasingly being called into question. This scepticism stems from persistent structural and political challenges, including entrenched practices of nepotism, favouritism and a centralised mindset among political elites and bureaucratic actors (Ayadi, 2025). These issues have impeded the effective implementation of intergovernmental coordination mechanisms, thereby weakening trust between different tiers of government and between the state and its citizens.

Following the context, IGR has attracted researchers, politicians and organisations, especially in the realm of IGR. It covers how power is shared among different levels of government, the connections between local entities and tiers, and the various activities and relationships that exist in between. Researchers have looked at IGR through administrative, fiscal and legal lenses (see e.g. Wright, 1974; Benton, 2020). IGR brings together federal, provincial and municipal groups to boost government teamwork, share ideas, coordinate efforts and resolve conflicts (Cameron & Simeon, 2000). Effective IGR can really help cut down poverty and boost growth. It does so by making it easier for local governments, provinces and the federal government to communicate with each other (Bolleyer, 2009; Acharya & Zafarullah, 2022). It tackles overlaps in the constitution, how things connect, the effects that spill over, and policy problems that go beyond single areas, encouraging teamwork and openness. This framework boosts multi-level governance and decentralisation, making sure responsibilities are shared fairly and public services are delivered efficiently. Therefore, public organisations can work on their own or together, which sometimes results in 'inertia' or solutions that settle for the simplest option (Painter, 2001). Modern IGR focuses on casual chats and interactions (Edwards, 2008). Higher levels of government have a big impact on politics. They shape power dynamics, responsibilities, resource distribution, financial management, policy creation, laws, institutional setups and political processes at lower levels. This leads, then, to an informal IGR framework.

Some researchers (Menzies, 2013; Phillimore, 2013; Acharya, 2021) argue that the federal and provincial governments have failed to make proper use of IGR mechanisms and lack an adequate understanding of their effectiveness. As a result, all tiers of government appear reluctant to fully assume their constitutionally granted powers and responsibilities. This not only prevents the development of positive trends in coordination, cooperation and coexistence but also weakens service delivery. Thus, inclusivity has

become more of a political slogan and a stepping stone for privileged groups to gain access to power. Unequal distribution of power has led to decision-making and resource allocation being concentrated within interest groups, obstructing both collaboration and healthy political competition. Traditional hierarchical approaches further hinder policy implementation and the exchange of ideas, creating barriers to achieving the vision of "unity in diversity" (Afesha, 2015). Therefore, when IGR functions well, it enhances collaboration and coordination among all three levels of government in the decision-making process. Conversely, poor implementation of IGR mechanisms, especially in low-income countries, presents significant challenges. In essence, the core objective of IGR is to ensure that policies and programs at all levels of government are designed and implemented with a citizen-centric approach to service delivery.

Drawing on the experiences of federal countries such as the USA, Canada, Germany and South Africa, where IGR systems are well-established and have not only fostered trust between citizens and the government but also promoted the notion of citizens as partners in every mechanism of governance, this study conducts a literature review of their practices, experiences and documentation. In doing so, it seeks to connect Nepal's federal practices to the broader global discourse on federalism and intergovernmental cooperation. Furthermore, the study contributes to a broader discussion on the challenges faced by developing countries in implementing effective IGR systems. This study seeks to examine how institutional mechanisms associated with the implementation of federalism and, particularly, IGR function in practice in Nepal. It aims to reveal the ways in which political interference, mechanical proceduralism, red tape and rigid bureaucratic systems have contributed to the inefficiencies and tensions in IGR. Furthermore, it explores the resulting gaps between different levels of government and identifies potential pathways to institutional reform and improved coordination. The core focus of this study is on operationalising the IGR mechanism in Nepal's federal system. The theory of central–local relationships is key in IGR research. It looks at how different levels of government interact in areas like legislation, execution and judiciary functions, along with decision-making and delivering services (Rhodes, 1997). It highlights the need for different institutions and variety, making sure the government is accountable and provides direction. This part looks at the current studies on IGR and the structural obstacles that can block connections between different levels of government. IGR focuses on policies, outcomes and impacts, unlike federalism (Wright, 1974).

This study sets up a way to grasp the specific challenges Nepal faces in its federalisation journey by looking at scholarly articles on federalism, cooperation between governments and financial decentralisation. It looks at key concepts like power balance, teamwork between institutions, and how resources are shared across different government levels.

3. IGR in other federating states

Globally, IGR performance has shown variability, functioning in hierarchical, dependent and competitive roles in some countries, while being inclusive, coordinated and cooperative in others (Rosenthal, 1980; Kincaid & Cole, 2016). In the USA, IGR is

characterised by competitive, collusive and coercive dynamics, heavily influenced by interactions among federating units. State governments often enforce more regulations over local governments than the federal government does (Kincaid & Cole, 2016). The federal government frequently struggles to address urgent issues due to polarisation among state governments. Provincial and municipal governments have taken on responsibilities for managing various issues such as immigration, sustainability, climate change, education, abortion, health care and interstate sales taxes (Rose & Bowling, 2015).

The strong connection and unified system strengthen the base of IGR in South Africa. Government bodies and state agencies use their legal power to create policies that need teamwork or shared duties. The lack of cooperation among the three levels of government in chasing common goals or working together on projects really undermines the effectiveness of many intergovernmental agreements (Malan, 2012).

After 1988, devolution became the main goal of Brazilian federalism. Local governments got more power, were held responsible, and used resources better because of this, thanks to democratic governance and economic changes (Jha, 2007). Throughout the twentieth century, governments went back and forth between dictatorial ones that centralised power and free ones that spread power all around. This change happened because the federal government had a lot of political and financial power, and there were no clear rules for how different federal governments should interact with each other. There was also more competition in national politics. The political power of each state is based on how well its leaders can work together with other state groups and the central government (Afonso et al., 2019).

Local governments (LG) in Canada can now engage in federal, provincial and territorial policymaking due to enhanced IGR. These relations have been ineffective because unfunded mandates remain, and trilateral IGRs have devalued (Hachard, 2022), resulting in weak LGs and an executive-dominated Senate. The responsibilities of provinces in health, welfare and education restrict the jurisdiction of LGs, ensuring intergovernmental conflicts (Cameron & Simeon, 2002).

Australian federalism guarantees equal state representation, yet the executive branch predominates in IGRs (Fenna, 2012). Relationships have become overly dependent on soft influences, facilitating the negotiation of joint programs and financial arrangements (Painter, 2001). Criticisms include lack of collaboration, coercive practices, *ad hoc* methods, absence of a strategic agenda, non-appreciation of state and territory contributions, lack of transparency, centralised decision-making and poor meeting procedures (Menzies, 2013).

The German IGR system includes vertical and horizontal IGR, centred on the 'Federal State' (represented by the *Bundesrat* and the *Bundestag*) and the 'State' (*Länder*), which consists of various bodies discussing political initiatives. A third pillar includes institutions that facilitate horizontal coordination among units within the *Länder* (Leonardy, 1998; Benz, 2009). Since the 1970s, interlocking politics and executive federalism have been contentious in Germany, with critics attributing economic stagnation, welfare state issues, lack of reforms and growing citizen disenchantment to poor IGRs.

India has both formal and informal relationships with other governments. The National Development Council and the Inter-State Council (ISC) sometimes share members. *Ad hoc* international conferences and area councils are good ways to solve problems between states, boost regional growth, and improve ties between the union and the states. India provides IGR in a global setting instead of a private or hierarchical one. In India, IGR is governed by centre-state and council-state ties, which, *mutatis mutandis*, work like courts. The ISC handles all government issues and controls ties between states. Collaborative government has become more important because of coalitions. The Council deals with problems between the union states (Hausing, 2023).

4. Methodology

This study examines Nepal using federalism and IGR theories to analyse authority, resource and responsibility distribution among government levels. Federalism theories emphasise the separation of sovereignty between central and subnational governments, each with unique capabilities (Krane & Leach, 2018). This study focuses on relationships, examining how institutional arrangements influence federal dynamics and intergovernmental cooperation, along with the systemic barriers hindering Nepal's federalisation process. The study examines interactions among various government levels in policymaking, budget management and administration, highlighting the impact of coordination and cooperation, or lack thereof, on governments (Fisk, 2022).

We collected data for the research from primary and secondary sources and purposively gathered primary data from October 2023 to April 2024. We conducted in-depth key informant interviews (KII) with 29 key informants, three members of whom were officials from the National Coordination Council (the participants included one from the federal government, one from provincial and one from local governments). Two participants from the Interprovincial Council (one from the federal and one from the provincial governments). Two participants were selected from the Provincial Coordination Council (one from the provincial and one from the local governments' representatives). Seven ministers of the Ministry of Internal Affairs from Lumbini, Karnali, Sudur Paschim, Gandaki, Bagmati, Madhesh and Koshi Province. We also interviewed three chairpersons from LG Associations: one from the Municipal Association, one from the National Association of Rural Municipalities, and one from the Association of the District Committee. Additionally, seven chief ministries of the provinces, one from the Ministry of Federal Affairs and General Administration, one from the National Natural Resources and Fiscal Commission, one from the Joint Secretary of the Prime Minister's Office, one from the Joint Secretary of the Ministry of Law, Justice and Parliamentary Affairs, and one from the Ministry of Finance were also interviewed. These interviews sought the participants' opinions on Nepal's intergovernmental procedures, effectiveness and accountability. They were also asked about how the three levels of government coordinate and eliminate impediments to exclusive and concurrent tasks. We also questioned the effectiveness of service delivery at the three levels of government. Open-ended and

open-structured questionnaires were utilised for these interviews. Transcription and classification of qualitative data yielded four themes, noted below.

5. Findings of the empirical research

5.1. The Constitutional Bench influences justice for personal gain

The 2015 federal constitution of Nepal established a Constitutional Bench in the Supreme Court, as stated in Article 137. This bench resolves disputes between various government levels, including federal-provincial conflicts and local election matters. The Chief Justice and four appointed judges define the constitutional limits of each government level (GoN, 2015).

The bench determines whether local, regional and federal laws are constitutional, and it also settles the major constitutional interpretative queries and sets the standard for how the federal government works in Nepal, although it has yet to decide on any major issues that make people wonder how well it can affect the IGR. The Bench has had to deal with many disagreements about natural resources, taxes, trade and federal units (three tiers of government) rights since the start of federalisation. It meets twice a week to resolve disagreements between government agencies, laws and how the Constitution should be interpreted (DRCN, 2020).

A few well-known cases show how difficult it is for the courts to do their jobs. Madhesh Province, for instance, fought back against the federal government's takeover of the *Sagarnath* Forestry Development Project in 2019, stating that it violated its constitutional rights. Additionally, Madhesh Province brought a new case against the central government, claiming that the Forest Act of 2019 broke the constitutional rights of provinces related to forests. It aligns with a case which was brought against the central government in 2018 for allegedly telling local governments what to do without first consulting them, which is a point-blank contempt of the concept of unity, set out in Article 232.

Another issue concerned public education. In Nepal, local governments run primary and secondary schools, and they establish their own rules for school mergers and teacher hiring. This has caused a lot of disagreement in the education field, as the Supreme Court ruled that selecting schoolteachers is the federal government's competence, raising much concern about the federal government overstepping local autonomy.

There is also a growing concern about the Bench's fairness, mostly because of its involvement in politics. A lot of people are afraid that the Prime Minister, ministers and the Chief Justice might be involved in choosing judges and making backstage deals. Of course, this has dire consequences for the Bench's power, integrity and claims of impartiality with respect to the other benches in the Supreme Court.

Article 137 of the Constitution of Nepal delineates the autonomy, jurisdiction, authority and decision-making responsibilities of the Constitutional Bench placed within the Supreme Court. While the constitutional provisions establish the foundational framework for the Bench, a critical examination of its operational effectiveness, the

impartiality of its rulings and the implications of these decisions for IGR remains imperative. The institutional strengthening of an effective IGR system and the consolidation of a balanced federal structure require several key conditions. These include a transparent and impartial process for the appointment of justices, the delivery of neutral and unbiased judgments, timely adjudication of cases and robust coordination among various levels of government to ensure the effective implementation of the Bench's decisions. A representative of the federal government expressed the following opinion during a KII interview regarding the need to enhance the effectiveness of the Constitutional Bench:

> From the beginning, political parties disagreed on whether a separate Constitutional Court should be established or a separate bench within the Supreme Court. In addition, Supreme Court judges disagree on whether the Constitutional Bench should be formed by lottery or appointed by the Chief Justice from nominees of the Judicial Council. Due to a shortage of judges, the Judicial Council has difficulty assigning justices to the Bench, causing delays and a perceived low priority. Many sessions are not held for more than a year, leading to unresolved jurisdictional conflicts and tensions among the three levels of government.

5.2. The Interprovincial Council: A hampered path to intergovernmental harmony

Nepal's constitution set up the Interprovincial Council (IPC) to tackle political conflicts between the federal government and the provinces. A group of ten, led by the Prime Minister, includes important ministers and provincial leaders (GoN, 2015). Nevertheless, the IPC has mostly stayed inactive for many reasons. A big hurdle is the federal government's hesitation to hand over power to the provinces, which causes friction between local leaders and the federal government. When provincial chief ministers focus more on their own interests or party agendas instead of working together, it really undermines the council's chance to create effective solutions.

Nepal's unstable coalition governments and changing political relationships make it hard for the IPC to make steady progress and stay committed to common federal goals. The IPC is stuck because of the highly embedded bureaucracy culture, which is marked by hierarchy, control and dynamics based on personalities. This makes the IPC less useful as an intergovernmental platform.

The Council has not been very active, holding just four meetings from 2017 to 2023. They have approved 84 tasks, but 40 are still waiting because of slow progress on important laws. The lack of any meetings since April 2019 shows that the Council is pretty much inactive right now. The IPC's role is unclear, and without local government input, there is a gap that makes it very difficult to tackle conflicts between different levels of government.

Among the many issues raised by the IPC, employee adjustment was a key issue for the institutional development of administrative federalism. In 2017, the Employee Adjustment Act was introduced and implemented to address this, but due to a lack of political consensus, reservations from trade unions and resistance from hardcore

bureaucrats nurtured by a centralised bureaucratic pathology, the act became ineffective. As a result, a second Employee Adjustment Act was introduced in 2018, and the process of employee adjustment was initiated. Accordingly, it was estimated that around 90,000 employees would be required across the three tiers of government to operate the federal governance system effectively. However, at that time, the number of employees stood at 87,000, of which 17,102 employees were working in local government units. But according to the initial estimates, approximately 50,000 employees were needed for local governments, 15,000 for provincial governments and 25,000 for the federal government. However, during the employee adjustment process under the Employee Adjustment Act, a total of 35,670 employees (41%) were adjusted for the federal government, 12,180 (14%) for the provincial government and 39,150 (45%) for the local government. This process was completed in a rush, with a political consensus to manage it more effectively in the future through the introduction of a new Civil Service Act. It failed to address administrative federalism, which in turn weakened the administrative IGR necessary for the implementation of federalism.

In 2022, the federal government attempted to draft the Civil Service Act. However, due to political disagreements, reservations from employee trade unions and the vested interests of hardcore bureaucrats raised in a centralised bureaucratic culture, the federal government has not yet been able to pass the Act. As a result, infrastructure development, service delivery and policy implementation at all tiers of government have been hindered. Nevertheless, the efforts made by the provincial governments to draft their own Civil Service Acts have helped address some issues related to employee management, professional development and resource distribution at the provincial and local levels. However, there has not been any significant improvement in activities such as organisation and management, human resource development planning, capacity assessments, training, study visits, workshops, or similar initiatives. Employees tied to the federal levels continue to receive benefits consistently, while others appear to be deprived of most facilities. Micromanagement by the federal government has obstructed intergovernmental cooperation, and in this context, the Prime Minister has issued warnings to the provinces not to challenge federal authority over security and police administration. Moreover, due to the lack of clarity in project distribution among different tiers of government, disputes frequently arise, and the mechanisms for resolving these disputes have proven to be ineffective. In this context, due to the absence of a Federal Civil Service Act, the management of Chief Secretaries working at the provincial level on a temporary basis under the federal government, Secretaries working in provincial ministries, and Chief Administrative Officers of local governments has been framed as a narrative of administrative IGR. Similarly, systems like the Intergovernmental Fiscal Transfer System and the voting process for National Assembly members conducted by elected representatives at the local and provincial levels have also been described as core activities of IGR. However, these interpretations fall outside the constitutional principles of coordination, cooperation and coexistence. A representative of the provincial government expressed the following opinion during a KII interview regarding the need to enhance the effectiveness of the IPC:

> All political, developmental, administrative and policy issues including disputes between the Federal and the Provinces, or between the provinces, should be addressed through the Interprovincial Council. However, the Council lacks both a dedicated secretariat and a legal framework. Since the IGR Act 2020, this constitutionally mandated body has become inactive, now operating under a section of the Prime Minister's Office. It meets irregularly and only for formalities. Regular activation of the Council could help resolve federal–provincial conflicts and strengthen intergovernmental relations.

Although such matters could be discussed in meetings of the National Coordination Council and the Intergovernmental Relations Council (IPC) to clarify the necessity, concept and functions of the IGR and since the federal government may need to further devolve powers, these councils are not holding regular meetings. As a result, the IGR has been bureaucratically redefined in a distorted manner, diverging from its intended purpose.

5.3. The National Coordination Council: Steering intergovernmental coordination

Nepal's federal, provincial and municipal governments are required to collaborate via the National Coordination Council (NCC), whose role is defined by the Federation, Province and Local Level (Coordination and Inter-relation) Act of 2020. Under the chairmanship of the Prime Minister, the NCC promotes intergovernmental collaboration on concurrent authorities, national interest, and provincial and local implementation (GoN, 2020). It also helps create concurrent power laws and policies to coordinate national policy. However, the NCC has been neglected due to the ruling party's internal disagreements, political inequalities and bureaucratic reluctance.

Nepal's patronage structure renders three NCC members sympathetic toward the government doubtful. This hurts the Council's ability to represent local governments and favours the Chair and the federal government. Provincial involvement may be marginalised due to federal and local conflicts, since their seven Chief Ministers may be outnumbered. This lack of fair participation has hampered provincial and municipal policy creation and execution. Provincial attempts to implement the Police Act and Civil Service Act were impeded by concurrent rights legislation complexities. Note that provincial actors may choose the IPC for partnership. A representative of the provincial government expressed the following opinion during a KII interview regarding the need to enhance the effectiveness of the NCC:

> National Coordination Council (NCC) meetings are often rushed and formal, lacking a results-oriented approach. Key issues raised at such NCC meetings are often seen as lacking results. Issues such as the allocation of conditional grants to small projects, bypassing the seven-step participatory planning process at the local level, limited role of the Fiscal Commission, staff shortages at subnational levels, police integration in the province, inadequate service facilities, weak law-drafting capacity at provinces and local levels, neglect of the 2075 Public Expenditure Review Commission report, and frequent changes in

provincial ministries due to political interests are regularly discussed. While decisions are made, implementation remains weak due to political apathy.

The NCC composition highlights representation inequality. Six federal government officials joined the NCC, compared to the three in the IPC. Provincial representation is confined to their seven chief ministers, whose seat is based on the Constitution. There is, therefore, a high possibility that federal and municipal governments may collude to marginalise provinces, raising concerns about their NCC power, because the local government representatives selected by the federal government appear to act in alignment with the interests of the federal government.

5.4. The Intergovernmental Fiscal Council: A centralised mechanism for resource management

The Intergovernmental Fiscal Arrangement Act of 2017 coordinates financial matters among the government tiers of Nepal by establishing the Intergovernmental Fiscal Council. The council includes federal and provincial finance ministers, local government representatives and expert appointees, fostering dialogue and collaboration on fiscal issues (GoN, 2017).

In Nepal's IGR system, this Council is very active. Its annual meetings assure constant participation and progress on crucial budgetary concerns mandated by legal requirements. Regular engagement is crucial to fiscal federalism, which distributes financial resources and duties across government levels for effective and equitable governance. And simplifying intergovernmental fiscal transfers has its effect. Resource allocations enable particular tiers to accomplish their objectives and balance national growth. The Council organises projects by government hierarchy to maximise resource use. The federal government oversees critical national projects, provinces, medium-sized ones and minor ones of local governments.

It handles a range of budgetary issues, from drafting laws to ensuring solid accounting, having its main focus on resource allocation, cash transfers, income projection and mobilisation, fiscal management analysis and reporting standards. It manages debt, oversees spending from the consolidated fund and handles borrowings. Even with the Council's helpful input, there are still problems with putting things into action. Administrative friction comes from issues like double-dipping in revenue collection, lack of involvement in budgeting and inconsistent use of processes throughout different levels of government. Complicated procurement and a conventional method for the allocation system hold back fiscal federalism.

One prominent concern lies in the imbalanced allocation of revenue rights, with the federal government retaining a significant 70% share compared to 15% each for provinces and local governments. Similarly, intergovernmental fiscal transfer indicators lack nuance, often employing a blanket approach. Resource distribution formulas, such as the 50%–25%–25% split for natural resource royalties, lack a demonstrably equitable basis.

What is more, delays in formulating essential laws, a propensity to abuse fiscal transfers and a knowledge gap across tiers about income production and spending

allocations compound these issues. Thus, the Council has not established a resource allocation mechanism that matches each tier's contributions and consumption demands. To maximise Nepal's federal fiscal system, administrative inefficiencies, resource allocation equity and IGR framework knowledge gaps must be addressed.

5.5. The National Natural Resources and Fiscal Commission: An unfulfilled potential

The National Natural Resources and Fiscal Commission (NNRFC) prioritise natural resource distribution and intergovernmental fiscal transfers, with its research and studies supporting fiscal federalism. The commission also makes crucial resource collection, allocation and recommends spending measures. Apart from this, the NNRFC must resolve natural resource use issues between government levels and distribute intergovernmental fiscal assistance and set provincial reserve fund distribution guidelines (GoN, 2017).

Although the NNRFC has the ability to empower subnational sovereignty and manage resource allocation, its current operation raises certain issues. As such, the existing income allocation system, which seems to favour centralisation, undermines provincial and local budgetary independence. Although the Constitution requires financial sovereignty, the Commission's powers are limited to equalisation, conditional grants, revenue sharing and capped natural resource royalties.

The Intergovernmental Financial Arrangements Act of 2017 significantly restricts the NNRFC's resource allocation function and may be marginalised since special and extra funding are channelled via the National Planning Commission. This method seems more about maintaining the Ministry of Finance's authority over the NNRFC than simplifying it. Limitations suggest that the latter's potential is untapped, yet several crucial actions are needed to fulfil its constitutional responsibility and create a federal Nepal. First, revenue allocation must be changed to encourage subnational resource mobilisation and fiscal self-reliance. Secondly, giving the NNRFC more fiscal tools, such as unconditional grants and flexible resource allocation methods, would help local and provincial governments manage their budgets and development goals. Finally, it must be independent from the Ministry of Finance and the National Planning Commission to arbitrate and facilitate intergovernmental fiscal interactions. The NNRFC's mission for Nepal's federal system is promising, but its constraints restrict its effectiveness. Decentralisation, greater powers and more autonomy are needed for the Commission to achieve fair resource allocation and develop subnational governance in Nepal.

5.5.1. The Provincial Coordination Councils: A patchwork of progress in the federal landscape

The 2017 Local Government Operations Act of Nepal requires each province to have Provincial Coordination Councils (PCCs) led by the Chief Minister. These councils,

comprised of provincial and local government members, promote policy coordination, resource management and strategic collaborations. However, the Councils' performance is unequal throughout Nepal, indicating both potential and limitations in its shifting federal framework. Annual PCC meetings are mandated by law, although attendance has been variable. Three provinces had three meetings in seven years, while Karnali Province held five. This discrepancy challenges the Councils' dedication and involvement.

Despite frequent irregularities, PCC meetings do cover important subjects, such as fiscal coordination between provincial and municipal governments and sharing budget plans, fiscal management techniques and grant distribution processes. Tax harmonisation, revenue sharing and concurrent jurisdiction, blocked by the federal government, are also crucial. However, the Councils struggle with personnel and administrative issues, simplifying provincial civil service commission procedures and executing the Police Act. In many ways, their meetings may help improve local and provincial service delivery and governance.

At the same time, local officials often feel overshadowed by the representatives of provincial government during meetings, expressing concerns that their grievances and perspectives go unheard. Moreover, decisions reached sometimes fail to translate into concrete action, raising questions about implementation and follow-through.

Despite these problems, the PCC platform is necessary for citizens to share their opinions, file complaints and talk about policies. Open conversation leads to more unity and understanding in the future, even if it provides results right away. The fact that the success of PCCs varies shows that Nepal's government structure is still negotiating who has what power and duty. To reach their full potential, these groups need to get past their party differences, find shared ground on touchy issues and come up with effective ways to follow through. In Nepal's complicated federal system, PCCs may transform from places to meet into important tools for working together and running the government.

5.6. The Sectoral Committees: Potentials and perils

Nepal has a complex government operated by a network of organisations that draft laws, monitor the administration and hold individuals responsible. This network revolves around Sectoral Committees, which coordinate federal, provincial and municipal health, roads, agriculture, education and other government efforts. Federal minister-led organisations may help governments collaborate and define growth targets. Despite their enticing purpose, many do not accomplish anything, making them seem ineffective.

A different picture unfolds in the federal Parliament. Ten standing committees look into finance, foreign relations, agriculture and social issues. Specialist committees, such as the Parliamentary Hearing Committee and the Sustainable Development and Governance Committee, investigate specific governance issues. These committees examine laws, give orders and investigate government actions, linking the legislative and executive branches. Parliamentary committees, while on a strong mission and good at monitoring, still have their weaknesses. Political parties often form strange alliances that keep proposals from

moving forward in committee, showing how they can hurt legislative progress. There are a few big hurdles that make these partnerships less effective.

The composition of these committees is challenging. Political parties, which value loyalty above experience, sometimes nominate members based on vote share rather than skill or fitness. This inexperience prevents the committee from doing meaningful analysis and asking stakeholders intelligent questions. Lack of committee meeting action plans or agendas compounds this problem. Instead of policy talks, political objectives typically drive random conversations. The noncompliance of government and non-government entities progressively weakens the committees. The performance of these committees depends on internal and external circumstances. Institutional capacity and member knowledge are important, but public demands, interest groups and international obligations may also affect their activities.

Nepal's committee system has a lot of promise for clear and accountable governance, but it needs to fix some basic issues. Committees play a crucial role in Nepal's democracy, and the government needs to enhance their skills and independence, focus on merit-based appointments, and establish clear objectives and procedures. Political parties, government agencies and civil society must work together. They should prioritise the national interest over their own agendas and make sure these committees do their important job as safeguards and promoters of good governance.

6. Discussion: Reframing cooperation, coexistence and coordination as rational choices within Nepal's federal landscape

A successful federal system is built on three key ideas: coexistence, cooperation and coordination. These concepts might seem similar, but they have different theories and uses in a federal system. Nepal's 2015 Constitution not only includes these principles, but they are also proclaimed to be the basics of a smooth and effective multi-tiered governance system. However, in case of their imbalance, dire consequences to intergovernmental relations (IGR) ensue, revealing deeper issues at the bosom of Nepal's federal structure and politics.

6.1. Coexistence as the framework for federal pluralism

Theorists like Lijphart (1977) based federalism on pluralism and consociationalism, promoting peaceful coexistence of multiple identities, political entities and jurisdictions under one political system. Federalism was expected to institutionalise cohabitation by encouraging local autonomy and regional identity in Nepal, a country with great ethnic, linguistic and geographical variety. That is why the Nepalese Constitution emphasises cohabitation between federal, provincial and municipal administrations, although experience shows otherwise. The federal government regularly violates subnational

autonomy due to centralist tendencies. While pluralism is expected to promote variety and local control, it somewhat weakens it instead.

Coexistence requires solid constitutional protections to push back against government overreach. Nepal's provinces and local governments frequently clash over federal instructions because of unclear jurisdiction and shared authority agreements (Acharya, 2021). In a coexistence system, different identities and ruling units can operate side by side without clashing. In reality, there are no clear rules for how things should work, highlighting that the constitution does not align with what actually happens.

6.2. Cooperation: A functionalist imperative for effective federalism

Cooperation, positioned under functionalism (Elazar, 2006), proposes that various levels of government must work together to meet common concerns, notably in economic growth, social welfare and environmental protection. Intergovernmental entities like the Interprovincial Council and National Coordination Council compel collaboration in Nepal. These institutions have struggled because of political reluctance, bureaucratic lethargy and unclear mandates (Adhikari & Upadhyaya, 2020).

Competitive dynamics and a collaborative culture among political elites in Nepal can overshadow the essential commitment to collaborative governance required for cooperation. Political actors often exploit IGR frameworks for personal or party gain, undermining genuine cooperation (Acharya, 2021). The deviation from theoretical expectations worsens due to the lack of confidence between federal and provincial administrations, as subnational entities often perceive federal measures as attempts to restrict their sovereignty.

For collaboration to work well, skills, transparency and responsibility are essential. Sadly, Nepal is missing these elements. When there is no solid legal basis for governments to work together, informal networks and quick decisions have taken over. Sometimes, informal procedures can work, but they usually do not deliver great results and just reinforce power imbalances. Nepal's federal approach aims for teamwork that brings together resources and skills.

6.3. Coordination: Navigating the boundaries of authority and accountability

Coordination matters in federalism, as it helps avoid governance paralysis and conflicts that arise from overlapping jurisdictions. Theorists such as McLaughlin (1918) and Osborne (2010) highlight the importance of clear lines of responsibility and coordinated efforts across various levels of government. In Nepal, coordination within IGR has been a hot topic. Confusion over shared powers in education, natural resource management and policing has led to ongoing tensions between the federal and provincial governments.

Nepal's experimentation with a federal government shows that working together can turn into conflict if there are no strong financial systems and ways to settle disagreements. The federal government does not want to give up power over important things like taxes and the police; in response, provincial governments have gone to court, often all the way to the Constitutional Bench. However, there are popular claims that the Bench is not strong enough and is too much under the influence of politics, which makes things worse (Subedi, 2021). Also, different levels of government often work alone, which makes service delivery across the country uneven. There are gaps, waste and delays in government results when there is no clear order for allocating projects. This shows that Nepal still does not have the coordination tools that supporters of federation say it should have. And this makes it harder to have a coordinated government.

6.4. Intergovernmental relations and federalism: A theoretical synthesis

Nepal deals with challenging intergovernmental issues because it needs to balance coexistence, cooperation and coordination, all key to making federalism work well. Still, political, legal and bureaucratic challenges make it hard to implement these principles. Wright (1974) highlights that the link between federal units and conflict resolution is crucial, indicating that Nepal's federalism is in its early stages of development. Weak connections between governments have created political games and a culture of dependence, leaving local governments often controlled by federal power.

This study thus situates itself within a broader federalism theory by demonstrating how newly established federations, particularly in developing nations, face distinct challenges in operationalising federal principles. Nepal's experience mirrors the struggles of other transitioning federations, where the formal structures of federalism are in place, but the informal political and bureaucratic cultures undermine their efficacy. The broader implications for federalism theory suggest that institutional design alone is insufficient; political will, administrative capacity and cultural shifts are equally crucial for successful federal governance.

7. Policy implications of Nepal's experiment with intergovernmental relations

Nepal's federalism and intergovernmental relations present critical policy implications that need to be addressed for the effective functioning of the new system. Concerns have been raised about the Constitutional Bench's independence and fairness, and it needs to be strengthened to make sure it stays that way. Changes are needed to help the Bench uphold the ideals of federalism without being swayed by politics. Therefore, it is about time to use the Interprovincial Council and give it the power to settle political disagreements between the central government and the regions. And when the Council is idle, states may still work together, having a clear goal, keeping everyone involved and working toward common governmental goals.

There is an excess of power in the National Coordination Council, with more federal and local government members than provincial ones. This makes it harder for the council to meet the goals of all levels of government. To ensure equal involvement, changes need to be made. It is also very important to improve fiscal autonomy and give the Intergovernmental Fiscal Council and the National Natural Resources and Fiscal Commission more power. These groups need more freedom, better ways to divide up resources, and the power to settle budget disagreements between levels of government.

The performance of PCCs of different areas is not uniform either, so it is important to make sure that everyone is involved and that people work together. Centralisation, political meddling and bureaucratic delay are some of the structural problems that the councils face. To fix these problems, the whole system needs to be reformed to remove cultural and systemic hurdles. This will make it possible for different levels of government to really work together and coordinate.

Boosting skills and sharing knowledge among different government levels can substantially enhance Nepal's federal system. This analysis points out the missing knowledge and skills in fiscal federalism, resource allocation and intergovernmental processes. Putting money into training and knowledge-sharing platforms can help officials tackle the challenges of the new federal framework. A varied policy strategy is needed to boost the independence and fairness of federal institutions, give power to local governments, improve fiscal federalism and tackle both structural and cultural obstacles.

8. Conclusion: Toward a functional IGR framework in Nepal

Nepal operates under a federal governance model. The goal is to share power, boost local control and create a fair political system. But this vision runs into challenges because of complicated federal structures and politics. The main problem is the unclear division of responsibilities between federal, provincial and local governments. This creates overlaps in authority, power conflicts and a tendency to centralise, even though the constitution encourages teamwork. When things are opaque, it leads to conflict and blunders in how public services are delivered. This weakens the idea of living together and slows down the push for a diverse and decentralised way of governing.

Political manipulation and the refusal to share power hider the functioning of federalism in Nepal. Federal–provincial cooperation was promoted via IPCs and the National Coordination Council. However, inactivity, political interference and imprecise operational parameters make these bodies ineffective. Political elites often emphasise personal and party interests above collaborative governance, cooperation and partnership. This shift from cooperative federalism demonstrates the country's lack of institutional trust and accountability. Despite the constitutional delineation of powers and responsibilities among the federal, provincial and local governments, weak fiscal and administrative processes have contributed to persistent overlaps and ambiguities in the exercise of authority and the discharge of duties. These challenges are further exacerbated by political interference, partisan interests and the influence of intermediaries within the

leadership of institutional mechanisms, all of which impede effective intergovernmental cooperation. Moreover, the absence of a robust intergovernmental budgeting framework, coupled with politically motivated distribution practices, has resulted in significant developmental imbalances and increased public dissatisfaction. Consequently, governance across the three tiers of government has become uneven, undermining the broader goals of federalism and inclusive development. Current coordinating methods raise disagreement over concurrent powers and resource distribution. Cooperation is only possible with rules and dispute resolution.

Vestiges of Nepal's unitary structure have hindered its transition to federalism. The political and bureaucratic culture is centralist, preventing subnational governments from fully achieving their autonomy. The conflict between constitutional decentralisation and political centralisation and the centres' reluctance to delegate authority fosters a culture of dependence among local administrations, hindering federalisation.

Nepal must reform its federal structure to enhance trust, respect and power-sharing. This requires adopting a cooperative political culture that promotes dialogue and consensus between government levels. Robust, clear intergovernmental institutions are essential for resolving conflicts, ensuring accountability and distributing resources. A balanced federal system needs a consistent legislative framework for collaboration and effective budget measures. Addressing these concerns will enable Nepal to harness the full potential of its federal experiment.

Functional intergovernmental relations rely on legislative and administrative reforms and the willingness of political actors to embrace collaboration, cohabitation and coordination. A strategy that promotes shared governance and national unity can help achieve the potential of a federal system. Nepal's federalism is a developing political initiative needing continuous commitment and management of challenges.

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The Experience of Legal Supervision of Hungarian Local Governments in the Light of Debt Settlement Procedures

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Abstract: The study focuses on the financial segment of the legal supervision of local governments in Hungary. It examines the experience of legality supervision, with a special focus on professional assistance and financial instruments, based on the reports of government offices. Drawing on the academic literature, it examines the general means of supervision, the main international approaches to financial supervision and the experience of Hungarian financial control. In the latter context, it relies on the analyses and reports of the State Audit Office of Hungary and takes stock of the debt resolution procedures that have occurred in Hungary after 2014, which the paper hypothesises may, in some cases, point to the limits of the means of legal supervision in the financial field. The study assesses recent legislative proposals and notes the importance of preventive instruments. It further points out that the most severe instruments often have a preventive effect.

Keywords: local governments, legal supervision, financial supervision, professional assistance, debt settlement

1. Introduction

A persistent problem of the Hungarian local governments' legal control since the country's democratic transition is the fragmented nature of financial control, which the state has so far tried to remedy through several measures, primarily through legislation. The general deficiencies of the legal control that existed until 2012 were already considered in studies carried out in the 1990s (see e.g. Szabó, 1993, pp. 467–468; Molnár, 1994, pp. 69–72), among which two cornerstones were recurrently insisted upon.

Firstly, in case of omission, there were few real means available, since dissolution – the most serious means of enforcement – was not used systematically and permanently, precisely because of its exceptional nature. Thus, public administration remained largely

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powerless to remedy failures to act, and control was not a real deterrent for local authorities in the event of infringements by omission. And second, there was the issue of financial control. The studies on that period mainly suggested clarification of the rules, as several cases exempt from legal control have financial implications. As Balázs (2020, p. 52) puts it, the control was "leaky", as financial control could not be carried out by the body that acted in the framework of the legal control, but by the State Audit Office of Hungary (hereinafter: SAO), which had limited capacities to audit nearly 3,200 municipalities.

The legal supervision that replaced legal control in 2012 has introduced strong measures to remedy infringements by omission, which have already been effective to some extent. This is illustrated by the fact that one of the most serious instruments – the replacement of the Regulation – has been used in only a few cases (7 cases between 2012 and 2024[1]). However, all but one of these cases were financial. The financial instruments remained limited after 2012 (Csűrös, 2023, pp. 58–92), and the most serious shortcomings in the current legal supervision are still in the financial field.

The hypothesis of the research is that only part of the Hungarian debt settlement procedures is caused by economic reasons that cannot be prevented by local preventive measures, if the tasks are properly performed. Others could be reduced by strengthening financial supervision instruments, as general economic factors are, in fact, only part of the triggering of debt settlement proceedings.

The Hungarian literature seldom addresses the financial issues of legal supervision; hence, it is important to review the basic elements of supervision and control, and the international solutions that have been developed in relation to state financial control over local governments. As such, the paper considers the recent international literature on the financial instruments of control in local government and reviews the control instruments currently in place in Hungary, the experience of legal supervision in Hungary based on government office reports and in-depth interviews,[2] with a special focus on financial instruments. It also considers the debt settlement procedures initiated after 2014, as the number of debt settlement procedures significantly decreased or even ceased for a period after the consolidation of local government debt. However, the re-emergence of debt settlement procedures as the tip of the iceberg after 2017–2018 indicates that the structural problems have not really been resolved. While it was thought for a long time after the debt consolidation that it was impossible to have such a situation again, from 2018 onwards, debt settlement procedures started to reappear. The main objective of the study is to make recommendations for reforming the tools of financial supervision based on international comparative analysis.

[1] Foktő 6/2013 (VI. 19.) Municipal Decree, Csömör 3/2014 (I. 31.) Municipal Decree, Érpatak 7/2018 (V. 9.) Municipal Decree, Érpatak 8/2018 (V. 9.) Municipal Decree, Terem 4/2019 (V. 23.) Municipal Decree, Balmazújváros 10/2023 (XII. 7.) Municipal Decree and Balmazújváros 11/2023 (XII. 7.) Municipal Decree.

[2] The in-depth interviews revealed the specific professional experiences of the government office's legal supervision. The interviews primarily asked about the different elements of professional assistance in each county, as well as the work organisation methodology.

2. The theoretical basics of the supervision and control toolbox

In the Hungarian local government system, the instruments of supervision are of particular importance in the relationship between the state and local governments after 2014. Having already discussed the theoretical aspects of legal supervision and control elsewhere (Árva, 2017; 2020), I will now focus only on the most important elements here. From a theoretical point of view, academic literature classifies the instruments of supervision that are still in use into two broad categories: facilitating or remedial instruments and substitutional instruments.

Facilitating instruments may include requests for information, which may be *ad hoc* or general, and advice, which is aimed at building consensus while respecting the autonomy of local authorities and is particularly suitable in the financial-economic field and for improving the efficiency of law enforcement (Kaltenbach, 1991, pp. 174–202). More potent instruments are the right of challenge and the right of review, which typically have a suspensive effect on implementation. The latter may also be accompanied by a right of cassation, which may lead either to a new decision by the local authority or to a court action by either the inspector or the body being inspected. It also includes the right of approval or authorisation, which, however, is a very limited right of autonomous decision.

Among the substitutional means is the substitution of an act to remedy a failure to act or to perform an act, which is always preceded by a binding decision, usually subject to appeal before a court. Substitution is therefore in fact the execution of a final judicial decision. The appointment of a public officer, which may be made on a temporary basis in the event of an infringement, is also a substitutional measure. As a last resort, the dissolution of the body can be envisaged, subject to the guarantees laid down in a higher legal standard.

Supervision is treated in the legal literature as a kind of asymmetric relationship, where the supervising body has a set of means, as detailed below, with the supervised body also having certain means, such as requesting information, opposing or going to court. In addition to the safeguarding aspects, gradualism and an appropriate cooperative relationship are important elements.

In terms of control, based on its relationship with the administrative system, it can be categorised as either internal or external (Lőrincz, 2010, pp. 222–228; Barta, 2022, pp. 28–41), depending on whether it is performed by an entity within or outside the administration. According to the principle of separation of powers, external controls may be carried out by bodies belonging to the legislative or judicial branches of government. These bodies may include the SAO, the Commissioner for Fundamental Rights, the courts, or the public prosecutor's office. In Hungary, this model was applied to local governments before 2012 (see Hoffman, 2024, pp. 6–18; Hoffman, 2025, pp. 281–295).

The European Charter of Local Self-Government sets out the international standards for local government regulation, which was created precisely to ensure financial autonomy (Bencsik, 2017, pp. 59–61; Bencsik & Ercsey, 2020, 226–227; Bencsik, 2024, pp. 45–54). However, in addition to financial considerations, the Charter also establishes standards for state supervision. One of these is the level of regulation, which may be constitutional or statutory. The other relates to its content, and it is necessary to distinguish between

elements relating to the local government's own functioning and the performance of state administrative tasks. The former can only be considered from a legal point of view, while the latter may also be examined for expediency. Furthermore, the Charter establishes the principle of proportionality, whereby the importance of the interests to be protected must be considered.

Based on the above, it is clear that all European states exercise some level of control over their local governments. The specific elements and extent of this control are influenced by several factors, particularly the general organisational system of public administration, the type of local government system, and historical and political traditions. Although local government systems are generally classified into four main types (the Anglo-Saxon, Scandinavian, French and mixed models), in terms of state control, the Anglo-Saxon, French and German–Austrian systems are the ideal types.

From the perspective of financial supervision, it is fundamentally important to consider whether the state structure is federal or unitary (OECD, 2022, p. 25). Therefore, although the debt settlement procedures in the U.S. offer noteworthy experience[3] in financial law, they will not be discussed here as the author wishes to focus on certain shortcomings in Hungarian legal supervision, i.e. that of a unitary state.

3. European solutions for financial control

Specifically on financial instruments, a study comparing 21 European countries (Geissler et al., 2021a) was carried out in 2019, partly based on empirical research data. The study also provided a summary overview of financial control instruments and procedures, as well as possible solutions for its organisation. The study categorised the instruments of financial control in legislation according to their impact, distinguishing nine instruments with increasing impact and listing the countries in which they are applied. The Swedish solution could not be included in this group, as there is no formal system of instruments for enforcing fiscal rules, but each local authority prepares a self-assessment which is published alongside the accounts (Geissler & Wegrich, 2021, p. 46). A specific system of instruments is also used in England, where financial and budgetary standards allow each local authority to set its own debt limit individually and compliance with these standards is checked by independent, non-administrative auditors.

At the lowest end of the scale of nine is the public warning, which is an attempt to use the power of publicity and public perception to persuade political actors to change. This tool is usually preceded in practice by some other informal warning. Only two countries use it: Spain and Estonia. The next option is the exercise of the right of approval, which can be limited to specific loans but can also cover the entire budget. Exercising the approval procedure also implies obtaining information, but the study points out that it does impose some restrictions on local autonomy in the event of refusal. In case of borrowing, the Hungarian system also has such a power, and eight of the European countries studied (Austria, Estonia, Germany, Hungary, Ireland, Slovenia, Spain and

[3] See about Detroit in Geissler et al. (2021b, p. 2) or Dove (2020, pp. 337–342), Hartmus & Walters (2015).

Switzerland) have this possibility, while only three countries (Belgium, the Netherlands and Portugal) have it for the budget as a whole.

In relation to the approval of loans, it should be stressed that supervision can essentially be based on a risk-based approach, taking into account that the loan portfolio can also be a predictor of potential breaches in addition to indebtedness. A specific subtype of credit control (Hulkó, 2016, pp. 109–112) is when it is applied as a consequence of an irregularity, which is the case in Germany and Austria (Geissler & Wegrich, 2021, p. 49). A more stringent instrument is the objection of local decisions, but this can concern not only the budget in the strict sense, but also any other decision with financial implications. This instrument is used in seven countries (Austria, Belgium, Estonia, Germany, Greece, Poland, Switzerland and Austria).

A stronger barrier is the supervisory body's ability to substitute the local authority's decision, a practice employed in four countries (Estonia, Germany, Poland and Switzerland). Meanwhile, five countries (the Czech Republic, Denmark, Hungary, Italy and Portugal) impose financial sanctions such as reduced subsidies or fines. The study acknowledges that these measures can be highly detrimental to local authorities, though they can be justified by the fact that authorities become ineligible for subsidies. However, it is worth noting that the study probably took the general instruments of state supervision of local authorities into account in its classifications. In Hungary, for example, the fines imposed in the context of legal supervision essentially aim to enforce administrative and procedural rules and are rather symbolic in amount.

The next level comprises various consolidation or cutback measures, which are typically conditional but can be combined with a public rescue package. The most serious of these measures include the appointment of state commissioners to oversee management and the removal of elected officials. However, the study notes that these measures are only available in Austria and Germany, while this tool can also be used in Hungary. It is worth pointing out in this context that, although this instrument may be indirectly linked to certain serious breaches of financial rules in Hungary, it is basically intended to remedy constitutional and operational problems, rather than financial ones.

While the instruments included in the study essentially represent a theoretical ranking, it may be worthwhile to conduct a more thorough empirical analysis of how these instruments function in this context, taking into account Hungarian peculiarities. This is because the Hungarian example clearly shows that some instruments do not necessarily carry the same meaning everywhere. Nevertheless, categorising and listing the instruments is a good starting point for learning about other European practices and possible legal solutions.

It is certainly important to identify the reasons why local governments do not comply with the rules and to ensure a degree of gradualness in the application of the instruments to allow for flexibility (Geissler & Wegrich, 2021, pp. 47–48), which is guaranteed by Act CLXXXIX of 2011 on Local Governments in Hungary (hereinafter Mötv.) as a whole in the context of supervising legality. The study also highlights the importance of informal methods such as persuasion, which can often help to avoid the need for more formal approaches. However, it also emphasises the importance of allocating sufficient time, administrative capacity and fostering trust between the parties involved. Nevertheless, further research is required to fully capture the importance of these informal instruments.

Another study has examined the organisational aspects of financial control and suggests that its design should take into account five main aspects. Firstly, it is necessary to decide which ministry should manage financial control, whether this responsibility should be shared between several ministries, or whether it should be vested in an extra-administrative body, such as the SAO. The centralised nature of the organisation is an important factor, as decentralisation in financial matters is strongly discouraged. The third aspect is whether the organisation is concentrated or decentralised. The former is favoured due to the concentration of resources and ease of coordination, whereas a decentralised design may be optimal for reasons of economies of scale. The fourth aspect is the mono- or multifunctional nature of the resulting organisation. It should be noted that none of the countries studied has created a monofunctional authority. The final aspect is the nature of the local governments of the country (Ebinger & Geissler, 2021, pp. 60–62).

The empirical analyses somewhat distort the above theoretical ranking. On the one hand, individual instruments may not carry the same meaning as initially thought. On the other hand, the impact of some instruments depends largely on legal practice, the specific social, economic and legal context, and sometimes informal rules (Geissler & Wegrich, 2021, pp. 47–48; Iovănaş, 2015, pp. 62–65; Cîrmaciu, 2024, pp. 549–569). A study of regulation and practice in North Rhine-Westphalia also illustrated this, showing that frequently changing regulations significantly impair the effectiveness of control instruments. The study covered the period from 1991 to 2020 in the federal state. During the initial period, the available instruments were essentially ineffective, making persuasion the primary approach. From 1994 onwards, the rules were considerably tightened and the instruments strengthened. In reality, strict control resulted in weak supervision, as local authorities developed "resistance strategies" (Geissler & Wegrich, 2021, p. 52), while inspectorates developed guidelines and were reluctant to apply severe sanctions. The budget commissioner *(Sparkommissar),* introduced in 2006, was eventually appointed in only three cases and failed to have the expected effect due to the global financial crisis that was emerging at the time. The ministry developed a programme to strengthen municipal finances by providing public bailouts, while supervision was tightened again by reducing discretion over sanctions. While the latter brought improvements, the onset of the pandemic led to a return to recession (OECD, 2020, pp. 13–22). In addition to these regulatory and empirical elements, the study points out that the capacity of supervisory authorities significantly affects their effectiveness. Overburdening leads to inconsistent actions by authorities and a relaxation of discipline. Such effects are also caused by the rapidly changing body of law and, curiously, by the predominance of ultima ratio instruments, which are reluctant to be applied (Geissler & Wegrich, 2021, pp. 51–52).

Although it is difficult to draw a general conclusion based on a single empirical study, it can be inferred from the aforementioned example or from Hungarian practice that the instruments stipulated in legislation alone do not always permit a well-founded conclusion regarding the effectiveness of financial supervision. It is also important to understand the purpose and frequency of use of the instruments employed, and in this area too, soft law instruments based on persuasion are of great importance, as will be demonstrated below in the context of compliance supervision in general.

4. Domestic tools and experiences of law enforcement instruments

4.1. The instruments of legality supervision

Instead of reviewing the general description of the tools of legal supervision, I rather highlight the noteworthy elements and experiences of these tools in relation to financial instruments. As such, we shall start with the main instrument of the general supervision procedure which is generally the letter of formal notice (Barta, 2016, p. 6). However, in cases affecting the management of local government, the SAO can initiate an investigation if the circumstances giving rise to the imposition of a supervisory fine occur repeatedly, i.e. the letter of formal notice is not necessary. If the letter of formal notice is ineffective, other instruments can be employed, even simultaneously, to eliminate the infringement as soon as possible. The Government Office will continue to use enforcement measures until the local authority has corrected the infringement. Within the framework of the call, the Government Office may propose changes to the local government's functioning, organisation, or decision-making process, and the body of representatives is obliged to discuss these proposals.

In case of a legal notice, the government office is legally bound by a 30-day time limit. Failure to comply with this limit can be remedied by issuing a new legal notice. A letter of formal notice is usually preceded by a request for information, which forms the basis for control and supervision, and consultation may be initiated on this basis. Professional assistance is another means of avoiding a letter of formal notice and is one of the most important preventive measures. Based on reports and the experience of government offices, these tools contribute most effectively to supervision without sanctions and can minimise the number of letters of formal notice and supervision procedures. Neither the Mötv. nor its government procedural decree contains detailed rules on the specific content of technical assistance, which must always be adapted to the individual situation.

As neither the Mötv. nor its procedural Government Decree 119/2012 (VI. 26.) contains detailed regulations on the specific content of professional assistance, they can be referred to as soft law instruments. Based on the reports, this may include organising meetings, maintaining personal contact or monitoring legislation. According to the law, verbal communication is only possible in this case and can take the form of personal contact, electronic communication via voice connection or non-personal communication via short text messages or electronic communication without a qualified electronic signature.

Between 2012 and 2014, the Mötv. provided for a specific financial instrument that still allowed the Hungarian State Treasury to initiate the withholding or withdrawal of a portion of the central budget subsidy specified by law. It also allowed the Treasury to conduct an audit of the local government's financial management by the SAO. Act XCIX of 2014 amended the support provisions. These were subsequently amended by Act LXXXIX of 2021 on the establishment of the central budget of Hungary for 2022, which subjected the SAO's audit to treasury control. A treasury audit may cover the obligation to keep accounts in accordance with accounting rules; the fulfilment of data reporting

obligations; the reliability and true and fair view of the annual budget report; and the economic justification of the obligation to plan for losses.

In light of international empirical studies suggesting the importance of soft law instruments in the financial sector, the following section will examine the lessons that can be learned from general legal supervision.

4.2. The experience of legal supervision in government offices

Since the capital and county government offices are involved in the implementation of the legality supervision, the experience of the domestic legal supervision can be followed up from the published reports of the county government offices, in addition to the personal interviews. To ensure a certain consistency in the aspects of the monitoring, the minister responsible for legal supervision defines the target areas and aspects of the supervision, while the county government offices can also respond to other problems that arise locally. Thus, although the main lines of supervision are consistent, there are specificities in the issues covered and in the methods used. The latter is strongly influenced by the degree of fragmentation of the municipal structure in a given county, as there can be differences of several times – six times at the extremes – between counties (KSH, 2024), which is in direct proportion to the number of protocols to be examined. At the same time, aspects of the organisation of work within government departments may also vary, with some departments employing subject officers for certain types of order, others organising work according to other criteria, and the extent to which the use of technical assistance is used varies considerably. It is true that the latter is also correlated with the previous aspect, namely the number of municipalities in the county. This is because, as international studies and in-depth interviews have shown, establishing a relationship of trust is the most important prerequisite for using this tool, and this can be achieved through meetings and personal discussions. In counties with a fragmented settlement structure, there is obviously less capacity for this, which means that the more classical instruments of supervision can necessarily predominate. However, reports from government offices also highlight the importance of a rapid and direct response (by telephone or email) when seeking professional assistance, particularly when there has been a change in the person of the clerk, when the clerk may have less experience, or when the former notary is returning to work after an extended absence. This option is also available in the case of fragmented municipalities (Veszprém County Government Office, 2023, p. 30).

Technological developments also impact the legality supervision, particularly the implementation of technical assistance. The Integrated Legislative System (IJS), consisting of several subsystems and modules, was introduced in 2021. The development of the Legal Supervision Written Contact module in 2023 made it easier to trace and search for legal compliance notices and send circulars and other assistance documents simultaneously as part of the professional assistance (Veszprém County Government Office, 2023, p. 33).

Metropolitan and county government offices publish information on target inspection results and legality supervision exercises in their office activity reports.[4] However, these reports are not available for all counties.

The published reports show that the main purpose of supervision is not to penalise local authorities, but to ensure that they operate lawfully. In many cases, this can be achieved through professional assistance. One common form of this is organising clerk meetings, during which information can be provided on aspects of the target inspection, potential problems and effective solutions. Notary meetings have also provided an opportunity to develop more personal relationships between government office staff and individual clerks, greatly facilitating and underpinning the subsequent use of technical assistance. Unfortunately, the period of the pandemic has set this progress back significantly (Hoffman & Balázs, 2021, pp. 40–44). Tools that can be included in the scope of assistance include the publication of methodological circulars and of the Official Gazette, which is published by the department several times a year if necessary.[5] General information and professional articles are also typically published on the Municipal Helpdesk interface (Csongrád-Csanád County Government Office, 2023, p. 37).

Reporting may also cover financial assets where appropriate, such as contributions to borrowing in the previous period. Experience from the 2013 and 2014 reports shows that this was supported to a significant extent by the government offices (Békés County Government Office, 2015).[6] However, in the reports on the subsequent period and published activities, there is little or no mention of financial measures. During the in-depth interviews, it was emphasised that the inadequacy of financial instruments generally has repercussions for supervision, which has essentially no instruments in cases where financial violations are not accompanied by other violations manifested in operations or decisions.

5. The evolution of debt settlements as an indicator

5.1. Debt settlement procedures after 2014

The number of debt settlement procedures is certainly not an indicator of the legal supervision, but as the tip of the iceberg, they are a good indicator of anomalies and difficulties in the management of local governments. Given that the debt consolidation (Lentner, 2016, pp. 427–439; Kecső, 2016) and reforms that took place between 2011 and 2014 have substantially reorganised the legal regulatory and economic environment, it is worthwhile to look at the developments since then. Overall, the measures have created a new situation, which was manifested in the fact that no debt settlement procedure was initiated for a longer period after the measures. However, something

[4] There is an interesting parallel in terms of searching for an optimal model for performing metropolitan financial tasks in Poland (see Ofiarska, 2022, pp. 173–189).

[5] Thus, in 2022, 6 issues were published annually in Csongrád-Csanád County.

[6] The report of the Békés County Government Office shows that in 2014, a total of 16 such reports were received, all of which were recommended for approval by the office.

changed in 2017 when Szakoly became, in effect, the first municipality to be in this situation again, followed by some others (State Audit Office of Hungary, 2018, p. 4).

Table 1
Hungarian debt settlement procedures after 2014

Name of the municipality	The debt settlement order[7]	Completion of the debt settlement
Verseg	25 February 2015	12 March 2019
Szakoly	14 February 2017	1 February 2018
Litke	8 January 2018[8]	3 September 2019
Csanádpalota	25 January 2018	25 May 2018
Szentegát	(23 March 2018) 7 June 2018	28 May 2019
Olasz	(19 June 2018) 5 July 2018	7 January 2019
Pilisjászfalu	(6 May 2019) 18 July 2019	21 July 2021
Hásságy	(28 January 2020) 17 February 2020	11 June 2020 (not a registered creditor)
Tiszatenyő	(6 March 2020) 6 April 2020	12 April 2022
Olasz	(28 December 2020) 30 December 2020	8 June 2021
Hugyag	(2 May 2022) 19 May 2022	29 November 2023
Váckisújfalu	(16 February 2023) 22 March 2023	4 December 2023
Mánd	(21 September 2023) 22 November 2023	25 July 2024
Hugyag	(1 February 2024) 19 February 2024	8 January 2025
Versend	(24 July 2024) 2 August 2024	
Fulókércs	(11 October 2024) 19 November 2024	
Ambrózfalva	(2 October 2024) 2 December 2024	
Balmazújváros	(application submitted in August 2024, but no final order at the time of closing the manuscript)	

Source: Compiled by the author.

Table 1 shows that, despite the long period after debt consolidation during which debt settlement procedures were expected to cease, they have in fact slowly increased since 2017, with the exception of Verseg. They have settled at three to five procedures per year since 2018. The exceptions were in 2019 and 2021. Notably, two of the 17 procedures were repeated within a very short period: the municipalities of Olasz and Hugyag underwent debt settlement twice. This suggests that the regulation's shortcomings (such as the lack of a time limit for creditors to register) are a serious problem, as it is difficult to accumulate debt again in such a short period of time. Another reason is the non-compliance or infeasibility of the reorganisation programme.

[7] According to Section 4(1) and (1a) of the Local Governments Debt Settlement Act, effective from 1 July 2024, the date of commencement of proceedings is the date on which the application is received by the court, but in most cases courts indicate the date of publication, as in liquidation proceedings. See, for example, the order of the Pécs Tribunal No. 5. Apk.1/2018/10. or the order of the Szeged Tribunal No. 10. Apk.1/2018/5.

[8] Only the completion order is listed in the cegkozlony.gov.hu database.

The case of Balmazújváros is unique because the legality supervision procedure in this municipality has repeatedly identified legal breaches, resulting in several proceedings before the Curia. However, the SAO has also conducted investigations. These investigations revealed that between 2021 and 2023, the municipality had raised overdrafts to address liquidity problems. However, neither the loaning nor the repayment was reflected in the accounting records and accounts for this period, despite legal requirements. In 2024, the body of representatives did not vote in favour of the loan (State Audit Office of Hungary, 2024b, p. 16). This case illustrates that continuous and careful legal supervision cannot prevent situations that could lead to debt settlement procedures, as the government agency currently lacks effective means to prevent and investigate financial problems, and the SAO's audit can only reveal the actual financial situation.

5.2. The experience of debt settlements

Between 2016 and 2017, the SAO conducted follow-up audits and published 14 reports on municipalities that had previously undergone debt settlement procedures. The SAO also pointed out in the reports that the selection mechanism was risk-based and therefore limited in its ability to draw general conclusions, rather than being based on representativeness criteria. However, given that several of the reports identified irregularities in task delivery as well as – or instead of – financial difficulties, one might question whether debt clearance could have been avoided with tighter controls.

Follow-up audits revealed that some creditor claims had not been met, suggesting that the municipalities' solvency had not been restored in the short term. This was partly because the reorganisation programme for the municipalities in question was merely a formal exercise, with no real plan to restore solvency. The financial administrator was also failing to fulfil his duties adequately. In light of this, the SAO recommended controlling the activities of those involved in the debt settlement procedure and improving the targeting of legal supervision (State Audit Office of Hungary, 2018, p. 5).

To substantiate further recommendations, the SAO examined which local governments had debts exceeding 60 or 90 days between 2012 and 2016. In such cases, it would have been mandatory to initiate proceedings. Based on the results, 675 local governments had such debts, but none of them initiated proceedings. The reasons for this were as follows: 1. 48% have agreed with creditors; 2. 22% disputed claim; 3. 18% had difficulties due to the timing of EU grants payment; 4. 6% owed only a small amount; and 5. 6% of overdue debts were included in the accounts due to an administrative error (State Audit Office of Hungary, 2018, p. 8).

The SAO also pointed out that although the law sets a deadline for submitting creditor claims, unlike in liquidation proceedings, there are no sanctions for failing to do so. This is because debts can still be enforced for two years after the debt settlement procedure concludes, meaning that part of the debt remains outstanding. In case of the local governments that were examined, this amounted to two-thirds of the total debt (State Audit Office of Hungary, 2018, p. 10). This rule is particularly difficult to understand, given that there is already a rule in liquidation proceedings regarding the final

and time-barred deadline for notifying creditor claims. Due to the nature of settlement agreements and the fact that creditors typically do not receive full satisfaction during the settlement process, it was not worthwhile for creditors to register, as they could hope for full recovery once the debt settlement was finalised. This unjustified distinction, compared to liquidation proceedings, greatly hindered the successful conclusion of debt settlement proceedings compared to general liquidation proceedings of commercial companies.

The procedure differs significantly from liquidation proceedings. In the latter, if an agreement is not reached, the procedure ends with the termination of the debtor, and the interests of the creditors are considered paramount. In case of local authorities, however, there is no termination, and a balance must be struck between the interests of the creditors and those of the local government. While the rule that creditors have a deadline for filing their claims, after which they lose their rights, works well in liquidation proceedings, in local government liquidation proceedings, creditors can file their claims after the 180-day period following publication of the proceedings. Based on court practice, this remains the case even if litigation is pending between the parties. In the absence of a formal creditor claim, the possibility of enforcing the claim is lost.[9]

This allows creditors to be properly counted, claims to be validated, and a predictable and calculable debt stock to be determined. In a conciliation procedure, only registered creditors who have entered into a forced agreement – which is also provided for in Section 23(5) of the Local Government Debt Settlement Act (hereinafter: Hartv.) – may participate, meaning that, in the event of a majority decision, the procedure also applies to those who disagree. Creditors who have not entered into the procedure certainly cannot expect any recovery, nor can those who have entered into the procedure under the provisions of the approved conciliation.

The obvious consequence of this regulatory gap is that the solvency of the municipalities concerned improved two years after the debt was settled, and then deteriorated again in the third year. Taking into account that 46% of debt settlement procedures did not fully satisfy creditors' claims, creditors became disinterested in reporting, since reporting creditors are subject to the rules of compulsory arrangement, typically implying partial recovery. In contrast, non-reporting creditors can obtain up to 100% recovery individually if the insolvency situation has not recurred. Similarly, while creditors could pursue rejected claims in court, municipalities could not dispute confirmed creditor claims by the financial administrator. This rule was not designed to protect public finances.

The SAO study also highlighted shortcomings in the performance of financial administrators (State Audit Office of Hungary, 2018, pp. 5–12). These included failing to approve commitments and payments, as well as failing to comment on budget proposals. Many of these proposals included irregular expenditure, such as appropriations for capital expenditure or voluntary tasks. Additionally, debt recovery remained incomplete. Another important task of the financial administrator is to identify the reasons for initiating the debt settlement procedure. This has also been formally omitted in several cases, as the

[9] Section 38(2) of Act XLIX of 1991 on bankruptcy and liquidation proceedings.

Hungarian law did not previously require these reasons to be put in writing. This makes it difficult to assess the performance and thoroughness of this task. Another issue identified by the SAO was that, in the event of a settlement, courts generally only examined the existence of the reorganisation programme and not its content, which is probably also due to this being standard practice in proceedings under Act XLIX of 1991 on bankruptcy and liquidation proceedings.

The SAO also commissioned a general analysis of the financial situation for 2024 (State Audit Office of Hungary, 2024a), the data source of which was the periodic budget reports of municipalities and their budgetary bodies and the consolidated data of the periodic balance sheet reports. This analysis is essentially based on mathematical analyses and shows certain trends, but is not, by its very nature, able to identify the problems of individual municipalities, even if the resulting data series are incorrect or unrealistic. However, if we compare this with the reports of the target audits of individual municipalities, in particular those of Hugyag or Balmazújváros (State Audit Office of Hungary, 2025; State Audit Office of Hungary, 2024b), it is clear that part of the problems are due to incorrect accounting that is not in line with the law or does not reflect reality, which may also be a way of masking the problems.

The individualised target audit reports are already capable of detecting these anomalies, but the SAO does not have the capacity to carry out such audits for all the municipalities. The individual interviews – Szakoly or Balmazújváros – also reveal that inadequate accounting played a significant role in the reasons for the debt being settled. The example of Balmazújváros also shows that these shortcomings cannot be remedied by the legality supervision alone, which is not able to compare the accounts with the real situation.

There is certainly a need for change in the legislation. One step in this direction was Act CXIV of 2023, which amended the regulation of the debt settlement procedure of local governments. This not only transformed the debt settlement rules but also expanded the scope of Act CXCV of 2011 on Public Finances by establishing the position of Budget Commissioner. The commissioner may be appointed in two cases under the rules that came into force in July 2024 (Article 39/A(1) of the General Tax Act).

Appointment of a Budget Commissioner is discretionary in case of certain financial breaches and is for a period of 12 months, whereas it is mandatory after debt settlement. The second set of mandatory cases can be justified by actual debt settlement procedures that have taken place since 2015. Two of the relatively small number of cases listed involved municipalities for which debt settlement was ordered repeatedly within a short period of time: after a few months for Hugyag and two years for Olasz. However, if the legislation is adopted as it stands, it will be left to practice to determine exactly which cases or indicators the Treasury will use to decide to appoint the Commissioner.

Among many other amendments, the law also changed the rules on debt settlement. One of the main points was that, under the amended Article 7 of the Hartv., creditors can only enforce their claim through the debt settlement procedure. The only exception to this is if the municipal bankruptcy commissioner has not notified them that they must apply; in this case, they can still enforce their claim for two years. Therefore, the legislator has clearly taken into account the data shown in the SAO's analysis by setting a deadline for creditors to submit claims, thus preventing them from coming forward after a successful

settlement and putting the local government in a situation that could lead to a repeated debt settlement procedure. Given that a significant proportion of debt settlement proceedings ordered after 2014 have been settled, the introduction of this time limit is particularly important.

The amendment also enhanced the role of the former Financial Secretary, who is now the Municipal Bankruptcy Commissioner. Under the new rules, government agencies appoint the commissioner, which is certainly to be welcomed, given that previously appointed liquidators were typically burdened with municipal debt resolution. This was partly due to the significantly different nature of the rules and partly due to the conceptually different procedure. This was further compounded by the fact that liquidators were typically familiar with the rules governing company management and had little knowledge of local government operations.

The amendments that came into force in 2024, therefore, created a different situation in many respects. However, the legislator wanted much stronger control over the finances of local governments, and the draft package of legislation submitted for public debate in March 2025 would extend the role of the Hungarian State Treasury even further (Government of Hungary, 2025).

This would further expand the existing optional and compulsory cases of the Municipal Budget Commissioner, increasing the number of compulsory cases from one to three and the number of optional cases from one to two in the event of serious financial and economic deterioration in the municipality. The last of these options offers a particularly wide margin of discretion and would directly affect the exercise of local government autonomy (Patyi, 2013, p. 391).

As shown by the amendment, the proposed solution would introduce an extreme value among instruments similar to replacing the regulation. Conversely, extending the powers of the government office and the Treasury would create split legal supervision, with normative legal supervision remaining with the government office and financial control being ensured by the Treasury, with the two bodies cooperating.

6. Conclusion

Examining the evolution of legal supervision since 2012, it is evident that legal supervision is a swift and effective means of remedying infringements, with the exception of financial ones. In particular, the electronic tools developed during this period have accelerated the search for solutions and the detection of infringements.

According to reports from government offices, technical assistance is increasingly being used, and it is particularly effective at eliminating general, mainly legislative, minor and unintentional infringements, which account for a significant proportion of infringements. In these cases, issuing a letter of formal notice and opening the supervisory procedure can be avoided. Although personal accounts show that the period of the pandemic represented a break in personal contact, a key pillar of professional assistance, the disappearance of the threat of the epidemic and the development of electronic tools

in particular have opened up new possibilities, further strengthening the use of this soft law instrument and clearly shifting the focus of enforcement towards prevention.

Although legal supervision offers more powerful and effective means, reports and interviews show that government offices do not exercise this power. Instead, they emphasise preventive activities, which minimise the number of letters of formal notice and initiated procedures (Fejér County Government Office, 2014, pp. 13–14; Csongrád County Government Office, 2016, p. 15). At the same time, the effectiveness of these instruments is ensured by an underlying set of rules that provide a toolbox for organisational and legislative oversight of legality, ensuring continuous monitoring. However, until recently, the areas excluded from supervision remained almost unchanged, with instruments including the possibility to initiate proceedings before another body. Although not explicitly excluded, the financial aspect was also particularly incomplete, since, in this case too, it is primarily another body – the SAO or the State Treasury – that can initiate proceedings. Nevertheless, the situation is special in that, when an infringement occurs, it cannot necessarily be detected on the basis of legislation and protocols alone, but only when the crisis is already quite serious. I must keep on insisting on the preliminary observation, that is that supervision is incomplete.

The reasons for debt relief are not always due to economic difficulties. This was particularly evident in the period between 2014 and 2020, when the period following debt consolidation but prior to the onset of the pandemic was examined. The data showed that the situation leading to debt resolution was not always inevitable. The main causes were irregularities in management or anomalies resulting from shortcomings in previous regulations, such as the emergence of previous creditors, the inadequacy of the reorganisation programme, and the financial administrator's failure to perform, which led to repeated procedures. These issues have been resolved by changes adopted in 2024.

However, in addition to repeated procedures, a significant factor is when deficiencies in the performance of local government body duties lead to debt settlement. If this does not manifest in circumstances that could form the basis of legal action, government offices view it as beyond their remit, rather than initiating a Treasury audit. The continued tightening of risk-based indicator rules, such as the imposition of mandatory debt clearance cases, has addressed these issues to some extent, but not where deficiencies cannot be detected in the accounts. Introducing additional preventive instruments, such as discretionary budget commissioner appointments, could help. However, the practical impact of this depends greatly on its implementation and experience in practice.

Taking into account international examples, there are a number of possible solutions for specific preventive measures, but the SAO and the bodies responsible for legal supervision of local governments, in their current composition, cannot carry out permanent control of all local governments with their current capacities. One possible solution could be a model that uses the power of the public to prevent such situations. But there is a serious question about the extent to which individuals can expose falsehoods and see through such situations. Another solution would be for the state to entrust the supervision of these accounts to another actor, whether from the market or the public sector.

Based on international examples and Hungarian general legal supervision, the main instrument is prevention, rather than *ultima ratio* measures, which can be provided by an organisation with sufficient capacity, backed up by more severe means as a final argument. To improve financial discipline, however, a more thoughtful set of rules could be proposed, including refining existing instruments. For example, the scope of the budget commissioner's competencies could be amended to include safeguards against restrictions on local government autonomy. After all, good cooperation between institutions serves the public good (Varga Zs., 2019, pp. 37–38).

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Analysis of Inflation Dynamics in Post-Communist Economies

The Case of Uzbekistan

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Abstract: This paper seeks to investigate the short-run and long-run relationship between price level and monetary, non-monetary and external factors of inflation in Uzbekistan, from January 2016 to August 2025. The Autoregressive Distributed Lag (ARDL) model is applied to examine the link between money (M), interest rate (R), exchange rate (FX), producer price index (PP), import volume (IM), global food prices and the consumer price index (CPI). The estimates of the bound test found the cointegrating associations among the variables. The alternative Johansen test confirmed the existence of such a long-run relationship. Additionally, M, FX and PP have long-run relationships with the CPI, while the elasticity of the CPI with respect to R and IM is not statistically significant in the long run. The error correction term (ECM) has a value of –0.18, which means that 18% of the deviation is corrected in each month. Moreover, R and FX have a positive and statistically significant effect on the CPI in the short run. Finally, the Toda and Yamamoto causality test established the bidirectional causality between M and the CPI in Uzbekistan.

Keywords: ARDL, bounds test, CPI, Uzbekistan

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1. Introduction

Stable inflation is a driving force in supporting macroeconomic stability and affects the overall performance of the economy. Stable inflation facilitates predictable economic planning among businesses and households; however, elevated price pressures negatively affect inflation expectations of businesses due to the uncertainty, and they impede decision-making and long-term planning. Additionally, high inflation leads to a reduction in the purchasing power of households, especially for those who have fixed income flows. Achieving low and stable inflation is therefore critical for economic well-being and reducing the financial vulnerabilities of economic agents. Hence, ensuring stable inflation should be a core mandate of the responsible authority.

The post-Soviet economies had exceptionally elevated inflation after gaining their independence, price liberalisation and monetary policy in transition being the main contributing factors thereof. These countries still administer price policies that are considered underlying causes of persistent inflation, even though the share of the administrated goods is small in the CPI basket (Atamanchuk et al., 2025). Uzbekistan, in turn, experienced pronounced inflationary pressures during the transitional period due to both internal and external factors. The exchange rate restrictions, introduced in January 1997, to protect local industries had negative welfare effects and accelerated the inflation rate through the increased import prices (Rosenberg & Zeeuw, 2000). This restriction contributed not only to inflationary pressures but also stimulated dollarisation in the economy. Therefore, Uzbekistan implemented a one-time big-bang liberalisation of the exchange rate market in 2017, and subsequently, the national currency, the Uzbek sum, depreciated relative to the U.S. dollar by 100% over the course of a single day. Simultaneously, annual inflation reached 13% in 2017. Moreover, the Covid-19 pandemic and the Russian–Ukrainian conflict caused supply-side disruptions, driving inflationary spikes in 2022, and these dynamics still have severe effects in several industries. It is important to note that some recent reforms in the energy market, such as price liberalisation, have managed to change the dynamics of inflation in Uzbekistan, though they still have secondary effects on prices. It is in this context that we are addressing the drivers of inflation in Uzbekistan.

Considering Uzbekistan's recent structural reforms, both in the real and monetary sectors, this study examines the short-run and long-run associations between monetary policy, supply disruptions and external factors of inflation in Uzbekistan. Specifically, the study aims to identify short-run and long-run relationships among interest rate, money, exchange rate, producer price index, import and global food prices in Uzbekistan using the ARDL model. Studying dynamic relationships among inflationary factors is relevant in the current transition toward an inflation-targeting regime. Additionally, Uzbekistan has started to liberalise prices, making it extremely important to understand the relationships between inflationary factors. The distinguishing feature of the study is that it attempts to estimate the short-run and long-run relationship between price level, monetary and non-monetary, and external factors of inflation using monthly data, presenting novel evidence on inflation drivers in a post-Soviet economy.

Structurally, the subsequent section is a brief literature review on the determinants of inflation. Next, the study outlines the structure of the Uzbek economy. The fourth section introduces the theories of inflation and an empirical literature review. The methodology and data are presented in section five. The sixth section introduces the results of the study, with section seven offering our conclusions.

2. Literature review on inflation dynamics

There is an exhaustive literature on the determinants of inflation; however, results vary, both in respect of a comparison between different countries and within selected, country-specific studies. Inflationary factors in wealthy countries differ significantly from those in transitional and emerging economies. As such, Kamber and Wong's (2020) study compares the drivers of inflation in various countries and suggests that oil price shocks as a driver of inflation have more pronounced effects in emerging market economies (EMEs) than in industrialised countries. Another study also identifies that oil price shocks exerted a statistically significant impact on prices in oil-importing economies, feeding into domestic headline inflation through transport, utility and food prices (Baba & Lee, 2022). Just like Mohanty and Klau (2001), who concluded that supply-side variables, external conditions and agricultural disruptions played a predominant role as drivers of inflation in emerging market economies (EMEs).

On the other hand, it has been demonstrated that demand shock had a negligible impact in emerging markets. Furthermore, Deka and Dube (2021), conducting a causality study between exchange rates and inflation in Mexico, found that exchange rates had a causal effect on inflation, suggesting strong exchange rate pass-through. In terms of Turkey, Lim and Papi (1997) argued that inflation was mostly caused by a government budget deficit. Similarly, fiscal imbalances were identified to be a principal determinant of inflation in developing countries by Catao and Terrones (2005). Applying the ARDL approach for India, Alam and Alam (2016) showed that supply-side factors were short-term drivers of inflation, while monetary growth had long-term dynamic interactions with inflation. Overall, determinants of inflation in EMEs are mostly caused by oil price shocks, supply disruptions and fiscal imbalances.

Empirical analysis of inflation dynamics is relatively limited and inconclusive in post-communist economies. Baranov and Somova (2015) studied factors of inflation in Russia and found that monetary factors, particularly money aggregate, were statistically significant determinants of inflation, whereas non-monetary factors, such as the consolidated budget, were not associated with inflation. But the wage growth also had a pronounced effect on inflation in Russia. Still, Masso and Staehr (2005) forcefully vindicated that wages did not have a significant effect on inflation in the post-Soviet Baltic states.

With respect to Uzbekistan, there is, however, considerably less literature available on inflation dynamics. There is, of course, the seminal paper of Akimov (2001) that investigated financial system reforms and stated that substantial fiscal deficit finance had inflationary pressure in the early years of transition. Ranaweera (2003) analysed

the dynamic relationship among goods, money and exchange rate markets under multiple restrictions, finding a short-run association between exchange rate and inflation. Ruziev and Midmore (2014) argued that the Central Bank of Uzbekistan (CBU) restricted cash to suppress inflationary pressures, having the cash and non-cash markets emerged, where the premium was around 8–10%. Al Rasasi and Cabezon (2022) specified a vector autoregression (VAR) model to evaluate monetary policy transmission. Accordingly, the policy interest rate of the CBU had a limited effect on core inflation, but the exchange rate shock had an insignificant influence on prices. One of the empirical studies of the CBU identified three sources of inflation: aggregate demand shocks, global economic uncertainties, ongoing supply chain disruptions, and structural inefficiencies in primary sectors of the economy, such as energy and transportation (CBU, 2024). Boymirzaev (2025) empirically assessed Factor-Augmented Vector Autoregression (FAVAR) and Bayesian Vector Autoregression (BVAR) models' ability in forecasting inflation in Uzbekistan. This empirical test was facilitated to optimise the forecasting capacity of the CBU.

3. Structure of the Uzbek economy

Uzbekistan has a small open economy with a Gross Domestic Product (GDP) of approximately 115 billion USD in 2024, which is around 3.094 USD per capita income (World Bank, 2024). The economy expanded substantially, especially following structural reforms in 2017. As a result, GDP per capita rose more than two times between 2017–2024, and economic growth accounted for 6.5% in 2024. The International Monetary Fund (2024) forecasted an annual 10.8% growth of per capita income in 2025–2030, which is the highest among the former Soviet Union economies.[1]

Figure 1 indicates the sectoral composition of GDP in the given time period, in which the structure of the economy has not seen drastic changes since 2010. While the industry's share has increased marginally, the share of agriculture has declined in GDP, and manufacturing accounted for 85.1% of all industrial output in 2024. The second biggest share was allotted to the mining and quarrying sector, making up 7.6% of total industrial output. Gas extraction fell from 61.6 billion cubic meters in 2018 to 44.6 billion cubic meters in 2024, posing potential risks to the economy in the future. Uzbekistan has already started to import gas, so fluctuations in gas prices can have inflationary pressure as an external factor as well, besides being a geopolitical instrument by exporter countries. The total volume of agriculture, forestry and fishing made up 19% of total GDP in 2024, with the share of the crop and livestock production adding 96.5%, forestry accounting for 2.5% and fishing for 1% of the total agricultural sector. Due to the high demand for mortgages and the faster rise of incomes, the construction sector has increased steadily, the proportion of construction in GDP having risen from 5.7% in 2017 to 7% in 2024. The contribution of the service sector expanded due to the liberalisation of the exchange rate and prices. Additionally, the Uzbek Government has invested substantially in tourism,

[1] https://tinyurl.com/ye2a8pus

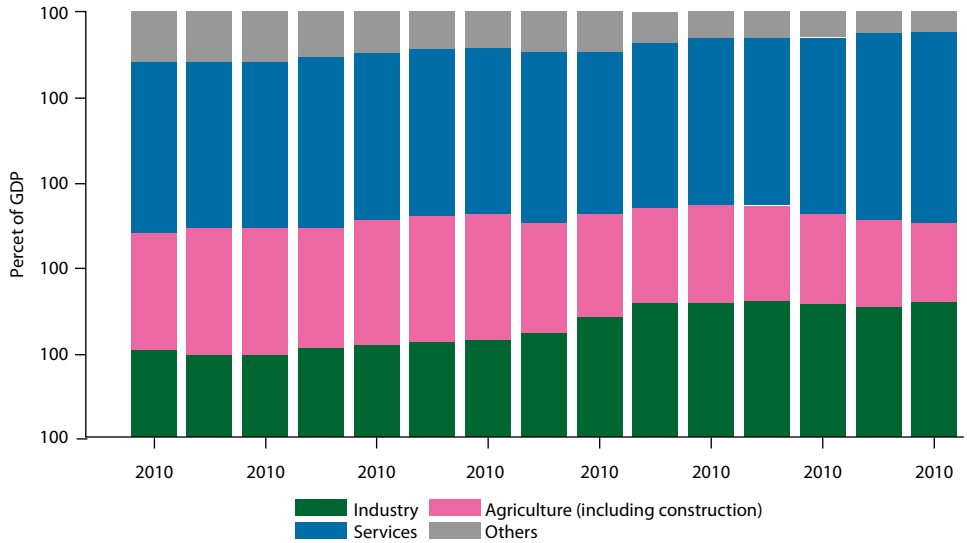

Figure 1
Composition of Gross Domestic Product by sectors
Source: Authors' calculation using World Bank Development Indicators and data from the National Statistics Committee of Uzbekistan.

transportation and infrastructure in recent years. The top three sub-sectors of services were accommodation and food services (22.4%), merchandise services (18.3%) and transportation (17.7%) in 2024.

Achieving stable inflation is complex due to several structural issues in the economy. As such, and owing to the dominant role of the state in the economy, monetary policy implementation is inefficient in controlling prices. In Uzbekistan, following the exchange market liberalisation in 2017, a supportive industrial policy is being pursued. These policies have involved granting tax incentives, providing energy subsidies and taking steps to safeguard domestic industries from imports. However, despite such incentives, price levels in those industries remain strikingly high. Limited competition because of monopolistic market structures contributes to price pressures in the transport industry and consumer durable markets, and the dominance of state ownership over the largest enterprises and banks is another substantial setback. As of 2025, nine out of the thirty-six commercial banks were state-owned, holding 65% of all bank assets and 61% of all banking system capital.[2] Thus, monetary policy is inefficient in itself because market-based instruments can hardly influence the behaviour of state enterprises and banks. Therefore, a strategic privatisation approach is highly necessary.

Additionally, a key source of distortion in Uzbekistan's inflation dynamics is the energy market. The Government of Uzbekistan subsidises the energy sector through the state budget, which has recently been placed under significant strain. For instance,

[2] https://cbu.uz/en/statistics/bankstats/2123881/

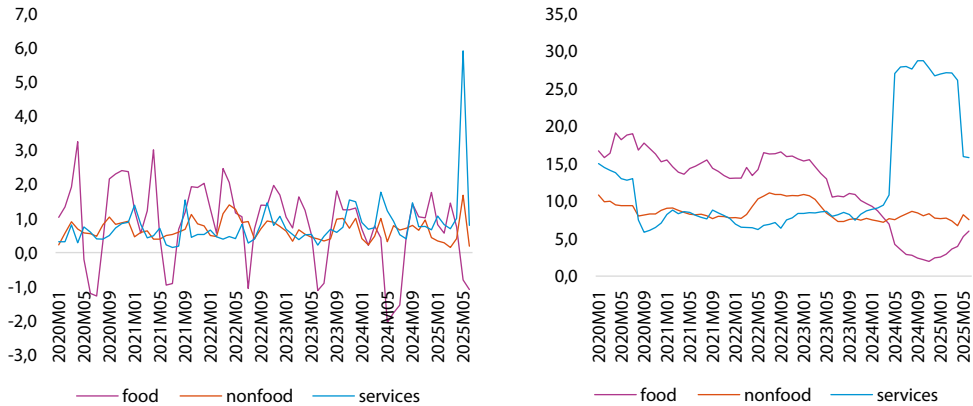

Figure 2
CPI components (% changes)
Source: Compiled by the authors using data from the National Statistics Committee of Uzbekistan.

allocated subsidies increased fivefold in just two years, rising from 5.63 trillion sums to 29.25 trillion sums (equivalent to 2.5 billion USD). Of this amount, 18 trillion sums were used to cover the difference between the cost of purchasing and selling gas, while 1.02 trillion sums were spent on geological explorations.[3] The Government of Uzbekistan has recently issued a new decree to implement market-based mechanisms in energy pricing through the gradual removal of budgetary subsidies. A new rule sets a social benchmark of 200 kWh of electricity for households, allowing subsidised tariffs up to this level and applying market rates beyond it. According to the IMF (2024), this reform is expected to serve as a key driver of future economic growth. However, such a policy initiative has considerably placed pressure on prices and delayed reaching a 5% inflation target in 2025.

The CPI basket in Uzbekistan includes overall 500 food products, non-food products and services. Figure 2 shows both the monthly and the year-on-year change of CPI components from 2020 to 2024. The left panel presents CPI compared with the previous month, while the right-hand panel presents the year-on-year CPI change.

The monthly CPI has seasonal patterns among all three components. The CPI tends to rise at the beginning of the year due to the shortage of supply in agricultural products in the winter period. However, all components usually fall in the summer period because of the harvest season that provides more supply of vegetables. Moreover, fluctuations in non-food and service components can be attributed to the liberalisation of energy prices, which significantly affected these categories. This measure cannot provide a conclusive interpretation since the CPI is measured relative to the previous month rather than a constant reference period. And the IMF issues the CPI data indexed to a fixed date. This variable offers more analytical value to examine CPI trends over time, and the indexed

[3] The data was collected from the telegram channel of the Ministry of Economy and Finance of Uzbekistan (https://t.me/minecofinuz/9021).

Figure 3

Inflation expectation

Source: Compiled by the authors using data from the Central Bank of Uzbekistan.

CPI with a base period of 2020 average had a constant increase in Uzbekistan during the last three years. That is why we have employed the IMF's indexed CPI in estimating the proposed model to obtain meaningful temporal comparisons.

The CBU, as a monetary policy authority, has conducted regular surveys to assess inflation expectations and perceived inflation among households and businesses since 2020. Figure 3 shows the dynamics of inflation expectations of households, businesses and the year-on-year CPI. The expectation report also includes the perceived inflation based on the subjective assessment of agents. The most recent survey, conducted in September 2025, including 3,420 respondents, reveals that household inflation expectation is largely driven by anticipated increases in utility bills (46%), energy prices (41%) and currency depreciation (22%). The proportion of depreciation expectation has been dominant among other factors since 2020. For example, the depreciation of the exchange rate accounted for 55% in December 2024 and placed third among other factors. However, it suddenly declined due to the consistent appreciation of sum against USD in the last few months. In September 2025, overall perceived inflation declined by 0.6 and made up 12.4%, marking the lowest level since December 2024. The impact of inflation was particularly pronounced in Tashkent and Qashqadaryo provinces, where residents reported a perceived inflation rate of 13.9% and 13.6% respectively. Nevertheless, the sustained rise in energy prices still has second-round effects on the broader economy. Overall, both inflation expectations of households and businesses are higher than CPI inflation due to energy prices and commodity price factors.

4. Inflation theories and empirical literature

4.1. Theories of inflation

Inflation theories are well-documented in the scholarly literature. Instead of sketching out a brief review, we are focusing exclusively on some of those influential theories that bear some relevance to the methodology and objectives of this study. As it is well-known, inflation theories provide various perspectives on the origins and mechanisms of inflation dynamics, serving as a basis for policy interventions and economic modelling.

One of the prominent theories is the Quantity Theory of Money, positing that inflation is predominantly influenced by the growth rate of money relative to the growth rate of nominal GDP. The statement of Milton Friedman (1970), that "inflation is always and everywhere a monetary phenomenon", still remains influential in developing and emerging economies. Friedman and Schwartz (1963) carried out an empirical analysis on the associations between the growth rate of money and the price index in the USA to confirm their theory.

Secondly, the Standard Phillips Curve Theory formulates a negative relationship between inflation and unemployment (Phillips, 1958). Later, this standard theory was extended by incorporating inflation expectations to explain short-run Phillips curve movements and the natural rate of unemployment to illustrate the long-run Phillips curve (Gordon, 2018). The Modern New Keynesian Phillips Curve specifies inflation as forward-looking and estimated by real marginal cost: output gap or unit labour costs (Gali & Gertler, 1999).

Finally, the Supply-Side Theory emphasises tax cuts for businesses for production and productivity (Ball & Mankiw, 1995). Complementary views include cost-push channels (commodity and wage shocks) and demand-pull pressures arising from positive output gaps.

4.2. Empirical literature

The interaction of the CPI with monetary, non-monetary and external factors of inflation has been widely studied in various countries using different models. This literature review section compares studies on transitional and developing economies, with particular emphasis on Uzbekistan.

Ghosh (1997) studies inflation dynamics in the former Soviet Union countries, suggesting that demand for money is strongly inflation elastic in the Baltic countries and Russia; therefore, conventional estimates generate a lower seigniorage – maximising inflation rate. It also emphasises the asymmetric monetisation in transitional economies, that severe inflation leads to rapid de-monetisation in these economies. For example, transitional economies tend to expand the money in circulation when inflation falls below 10%. Isakova (2010) investigates inflationary factors in Kazakhstan and Kyrgyzstan using the Johansen cointegration test and Vector Error Correction Model (VECM). The study found that lag of inflation had a statistical significance on inflation, and a strong exchange

rate pass-through is observed. Both analysed countries are small, open and import-dependent economies; therefore, the exchange rate tends to have a substantial influence on prices through import prices. The study estimated the inflation equation by incorporating oil prices and dollarisation, and the results show a strong association between oil prices and inflation. As such, the central bank's independence and credibility are suggested as key policy implications to achieve stable inflation.

The most well-researched post-Soviet economy is Russia, with particular attention dedicated to inflationary factors. Most studies agree in finding monetary factors as sources of inflation in these economies (Koen & Marrese, 1995; Hoggarth, 1996; Korhonen, 1998). Nikolić (2000), for instance, observed a strong interaction between monetary aggregates (M0, monetary base, M2 and broad money) and inflation, using a finite distributed lag model in which the dependent variable, inflation in the study, depends on current and lagged values of the money growth. It concluded that money growth is a key determinant of inflation in Russia. Lissovolik (2003) analysed the dynamics of inflation by using a markup model and a money market model in Ukraine, identifying that wages and exchange rates are significant long-term drivers of inflation, whereas monetary factors play a more immediate, short-term role. In line with this, Siliverstovs and Bilan (2005) confirmed that inflation is primarily driven by devaluation expectations among economic agents in Ukraine. Rozenov (2017) assessed how exchange rate depreciation affects inflation through import prices using a VAR model. The pass-through is found to be 20–30%, which is high and consistent with other transitional and emerging economies. It suggested promoting de-dollarisation and fair competition in the goods market. Zainidinov (2021) analysed the short-run and long-run association between budget deficit and inflation using the ARDL model in Kyrgyzstan. The results show that the elasticity of inflation is 0.24% in the short-run and 0.63% in the long-run with respect to a one-percentage increase in the budget deficit.

Kuma and Gata (2023) assessed food price inflation using the ARDL model in Ethiopia. The results confirm that monetary policy variables, such as interest rate and reserve money, were the principal forces of inflation, and monetary factors had a positive and statistically significant correlation with food price fluctuations. Valogo et al. (2023) examined the threshold effect of exchange rate pass-through in Ghana. The results of the threshold model suggest that currency depreciation beyond 0.70% (threshold level) has a significant pressure on inflation. Asandului et al. (2021) investigated the link between fiscal policy and inflation in post-communist European countries using a nonlinear ARDL model. The model results reveal that fiscal policy does not have significant effects on inflation in the short run. Mihajlović and Marjanović (2020) empirically estimated the asymmetry nature of inflation in post-Soviet Baltic states using a nonlinear ARDL model. The study found that inflation is more sensitive to economic expansions than to contractions, consistent with downward price and wage rigidity. Specifically, inflation responds more strongly to a positive output gap and a negative unemployment gap. They suggested that disinflation policies relying on demand contraction impose relatively high output and employment costs. Overall, these studies emphasise the importance of monetary factors and non-monetary factors as drivers of inflation in emerging, developing and transitional economies.

5. Methodology and data

5.1. Model specification

To inflationary factors, comprehensively, we have constructed the following equation that incorporates monetary, non-monetary and external determinants of the price level.

$$CPI_t = \alpha + \beta_1 M_t + \beta_2 R_t + \beta_3 FX_t + \beta_4 PP_t + \beta_5 IM_t + \beta_6 GFP_t + D + \varepsilon_t \quad (1)$$

α is intercept term,
β_1 and β_6 are coefficients,
CPI_t is consumer price index,
M_t is broad money,
R_+ is short-term commercial bank lending rate,
FX_t is nominal exchange rate of Uzbek sum relative to USD,
PP_t is producers price index,
IM_t is import volume,
GFP_t is global food price index,
D captures two dummy variables,
ε_t is error term.

5.2. Bounds testing approach for cointegration analysis

Traditional cointegration methods of Engle and Granger (1987) and Johansen (1988) require variables to share the same integration order; however, these tests tend to produce bias and unreliable results when series are in different integration orders. Pesaran et al. (2001) address such an issue using the ARDL bounds testing approach for cointegration analysis. Hence, regressors can be a mixture of integration orders, either I(0) or I(1), but not I(2) or higher. Since the ARDL model is a single equation model, it simplifies estimation and inference and allows regressors to have different lag orders. It also enables consistent estimation of long-run relations, short-run adjustments, typically via an error-correction form. Notably, the ARDL can address the autocorrelation and endogeneity issues by selecting an appropriate lag order. If there are structural breaks or outliers in the data, incorporating dummy variables can handle such issues. Therefore, the ARDL is well-suited to examine short-run and long-run interactions between price level and monetary and non-monetary and external factors. Following Pesaran et al. (2001), the ARDL bounds test equation takes the following form.

$$\Delta CPI_t = \alpha_0 + \beta_1 CPI_{t-1} + \beta_2 M_{t-1} + \beta_3 R_{t-1} + \beta_4 FX_{t-1} + \beta_5 PP_{t-1} + \beta_6 IM_{t-1} + \beta_7 GFP_{t-1} + \sum_{i=1}^{q} \delta_1 \Delta CPI_{t-i} + \sum_{i=0}^{p} \delta_2 \Delta M_{t-i} + \sum_{i=0}^{p} \delta_3 \Delta R_{t-i} + \sum_{i=0}^{p} \delta_4 \Delta FX + \sum_{i=0}^{p} \delta_5 \Delta PP_{t-i} + \sum_{i=0}^{p} \delta_6 \Delta IM_{t-i} + \sum_{i=0}^{p} \delta_7 \Delta GFP_{t-i} + dummies + \varepsilon_t \quad (2)$$

Equation (2) has both the short-run and the long-run parts of the ARDL model. The outcome variable is the difference of CPI, coefficients from β_1 to β_7 capture the long-run part of the model, indicating how lagged level values of both CPI and other explanatory variables affect current changes of price level. The second part, which is the summation of the lagged differences of both outcome and explanatory variables, represents the short-run dynamics of the model. The short-run part has its own coefficients from δ_1 to δ_7, q and p are the number of lags.

The null hypothesis of the bounds test checks the absence of a long-term relationship or cointegration between the variables being studied. In other words, H_0: $\beta_1 = \beta_2 = \beta_7 = 0$. To evaluate the null hypothesis, it is necessary to assess the F-test, which has the following mathematical form.

$$F = \frac{(SRR_r - SRU_{ur})/p}{SRU_{ur}/(t-2p)} \quad (3)$$

Here, SRR_{r} is sum squares of the residuals for restricted model, SRR_{ur} is sum squares of the residuals for unrestricted model, t is the number of observations, p is the optimal lag number.

The F test results can be interpreted in three scenarios. First, if the F-statistic is higher than the upper critical bound, the null hypothesis of 'no cointegration' is rejected, confirming the existence of cointegration. Second, if the F-statistic falls below the lower critical bound, the null hypothesis is not rejected, and this is evidence of no cointegration. Finally, if the F-statistic is found between the lower and upper critical bounds, the result is inconclusive, and no definitive conclusion can be drawn.

Next, we estimate short-run parameters using the Error Correction Model (ECM). Equation (4) demonstrates the ECM representation of the ARDL model.

$$\Delta CPI_t = \alpha_0 + \sum_{i=1}^{q1} \eta \Delta CPI_{t-i} + \sum_{i=0}^{p1} \delta_1 \Delta M_{t-i} + \sum_{i=0}^{p2} \delta_2 \Delta R_{t-i} + \sum_{i=0}^{p3} \delta_3 \Delta FX_{t-i} + \sum_{i=0}^{p4} \delta_4 \Delta PP_{t-i} + \sum_{i=0}^{p5} \delta_5 \Delta IM_{t-i} + \sum_{i=0}^{p6} \delta_6 \Delta GFP_{t-i} + \gamma ECT_{t-1} + dummies + \varepsilon_t \quad (4)$$

ECT is an error correction term that captures the speed of adjustment or deviation from the long-run relationship with the coefficient γ. If the coefficient of the ECT is negative γ and statistically significant, it shows short-term deviations and diminish over time, and the series eventually return to the long-run equilibrium. A proportion γ of the deviations is corrected in each period, and all deviations are expected to dissipate by the end of 1/γ periods.

Following Sankaran et al. (2019), Alper et al. (2023) and Daly et al. (2024), this study applies the Toda–Yamamoto (1995) causality test due to the mixture of both stationary and non-stationary variables. The Toda–Yamamoto causality test provides a robust paradigm for checking long-term causal relationships in the case of different cointegration orders. As opposed to the traditional Granger causality test, which may produce unreliable outcomes with non-stationary series, this framework uses the level values of the variables that yield deeper insights into causal dynamics. The Toda–Yamamoto causality test does not need regular ordering among variables or the presence of a co-integration relationship; therefore, it is applicable to various data setups. Furthermore, the test adheres to an asymptotic χ^2 distribution, irrespective of whether the series are stationary, trend-stationary, or cointegrated, thereby ensuring its robustness across varied time series properties. We take three distinct steps to apply the Toda–Yamamoto causality test. First, a vector autoregression (VAR) model is specified to determine optimal lag length (p). Second, the VAR model is estimated by incorporating the highest degree of integration of the series (d_{max}) and estimate the model with ($p + d_{max}$) lags. Third, restrictions are applied to the coefficients associated with (d_{max}) and the significance of these restrictions is evaluated using the modified Wald test.

5.3. Data sources

Monthly data were collected from the National Statistics Committee of Uzbekistan, the Central Bank of Uzbekistan and the Enhanced General Data Dissemination System of the IMF, covering the time period between January 2016 and August 2025. Fiscal policy variables and output gaps are not included because the two variables are only available on a quarterly basis. The year 2016 was chosen because data for import volume and producer price index are unavailable for earlier periods. This study uses the CPI as a proxy for inflation, and the producer price index was chosen to approximate supply-side pressures. Also, the study includes the short-term lending interest rate, the broad money and the nominal exchange rate of Uzbek sums relative to the USD. Furthermore, as Uzbekistan is a small, open and import-dependent economy, the total import volume is included to reflect the impact of imports on domestic prices. The global food price index serves as an external factor affecting the domestic price level. Table 1 summarises the statistical properties of the variables. The results show that only M and GFP are positively skewed, while the other variables are negatively skewed. The Jarque–Bera probability confirms that M and IM are normally distributed.

It is essential to verify that the variables need to be integrated into an order of zero or one, but not to be two or more, in order to apply the bounds testing procedure. Therefore,

Table 1
Descriptive statistics and normality test results

	CPI	M	R	FX	PP	IM	GFP
Mean	4.60	11.63	20.52	9.04	4.51	7.60	4.70
Median	4.63	11.59	21.51	9.24	4.61	7.61	4.64
Maximum	5.10	12.66	25.73	9.46	5.25	8.36	5.06
Minimum	4.02	10.65	12.44	7.94	3.56	6.66	4.45
Std. Dev.	0.32	0.55	3.504	0.46	0.50	0.41	0.16
Skewness	–0.24	0.02	–1.00	–1.41	–0.42	–0.26	0.32
Kurtosis	1.84	1.99	2.84	3.56	1.92	2.11	1.82
Jarque–Bera	7.60	4.86	19.63	40.02	9.13	5.09	8.71
Probability	0.02	0.08	0.00	0.00	0.01	0.07	0.01
Sum	534.0	1,350.1	2,381.2	1,049.4	523.3	882.1	545.6
Sum Sq. Dev.	12.2	35.4	1,412.7	25.3	29.2	20.2	2.95
Observations	116	116	116	116	116	116	116

Source: Compiled by the authors.

Table 2
Unit root and stationarity test results

Variables	*Integration level*	**ADF test**		**PP test**		*Integration result*
		Intercept	*Trend and intercept*	*Intercept*	*Trend and intercept*	
CPI	Level	0.0960	0.9938	0.0903	0.9947	I(1)
	The first difference	0.0000	0.0000	0.0000	0.0000	
M	Level	0.9347	0.2620	0.9394	0.2720	I(1)
	The first difference	0.0000	0.0000	0.0000	0.0000	
PP	Level	0.5832	0.8498	0.4586	0.9059	I(1)
	The first difference	0.0000	0.0000	0.0000	0.0000	
GFP	Level	0.6607	0.7388	0.6716	0.7710	I(1)
	The first difference	0.0000	0.0000	0.0000	0.0000	
Breakpoint unit root test						
R	Level	*Break date*		*Probability value*		I(0)
		2020m06		< 0.01		
IM	Level	2017m01		< 0.01		I(0)
FX	Level	2017m08		< 0.01		I(0)

Source: Compiled by the authors.

we confirm the stationarity of variables using the unit root; the test results are presented in Table 2. Uzbekistan has recently held substantial structural reforms that led to ups and downs of economic fundamentals, including the interest rate, exchange rate and import volume. As such, this study employed a breakpoint unit root test to assess the stationarity

of R, IM and FX, considering the potential impacts of structural changes in the economy. Additionally, two dummy variables are incorporated to control those structural breaks. Specifically, the first dummy captures average shifts due to the exchange market liberalisation in September 2017, and the second dummy is included for the regime shift in 2020.[4]

6. Empirical results

The unit root test results indicated a mixture of I (0) and I (1) processes across the variables in the previous section, with no series integrated of order two. Thus, we have applied the ARDL bounds testing procedure to assess the existence of a long-run relationship. Prior to the interpretation of the main results, diagnostic tests for residual serial correlation and heteroskedasticity, as well as standard stability tests are conducted and are reported in Tables 3 and 4. According to the Breusch–Godfrey Serial Correlation LM test results, failing to reject the null of no serial correlation up to lag 2, there is no serial correlation. The Breusch–Pagan–Godfrey test results fail to reject the null hypothesis of homoskedasticity.

Table 3
Serial correlation test of residuals

Breusch–Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	1.385249	Prob. F (2.85)	0.2559
Obs*R-squared	3.251221	Prob. Chi-Square (2)	0.1968

Source: Compiled by the authors.

Table 4
Heteroskedasticity test: Breusch–Pagan–Godfrey

Heteroskedasticity Test: Breusch–Pagan–Godfrey Null hypothesis: Homoskedasticity			
F-statistic	1.444598	Prob. F (5,110)	0.2140
Obs*R-squared	7.147633	Prob. Chi-Square (5)	0.2099
Scaled explained SS	5.743387	Prob. Chi-Square (5)	0.3320

Source: Compiled by the authors.

The ARDL bounds test result includes two elements. The first element is the F-statistic for the joint significance of the lagged level terms and a t-statistic for the coefficient on the error-correction term. The second element is the critical values of the bounds test that are compared with the F-test and t-statistic in order to make a conclusion. An important criterion is the null hypothesis of the test, that there is no cointegration

[4] The dummies are constructed by taking the value of zeros before the structural break and ones thereafter.

Table 5
Cointegration results using bounds test

Null hypothesis: No levels relationship Number of cointegrating variables: 5 Trend type: Unrest. constant (Case 3) Sample size: 114						
Test statistic					Value	
F-statistic					8.1	
t-statistic					−5.6	
	10%		5%		1%	
Sample	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
			F-statistic			
Asymptotic	2.2	3.3	2.6	3.7	3.4	4.6
			t-statistic			
Asymptotic	−2.5	−3.8	−2.8	−4.1	−3.4	−4.7
* I (0) and I (1) are respectively the stationary and non-stationary bounds						

Source: Compiled by the authors.

among selected variables. To assess this hypothesis, we compare estimated statistics with critical values in Table 5.

The cointegration results are generated relying on Case 3, which is unrestricted constant (no deterministic trend). This study examines the null hypothesis of no levels relationship among variables using 114 monthly observations. The estimated F-statistic is 8.1, which is higher than the upper critical value at 1%, 5% and 10%. Moreover, the t-statistic results offer further robustness for cointegration analysis. The absolute values of the t-statistics are 4.7 and 4.1 at one percent and five percent confidence intervals, respectively, and the estimated t-statistic is 5.6 at the absolute term, which is higher than both intervals of critical values. Thus, the null hypothesis is rejected based on the t-statistic, further confirming the existence of cointegration among the variables. This result confirms the theoretical framework of Pesaran et al. (2001), who employed to test cointegration between variables in the case of stationary and non-stationary series. We also checked the robustness of the F-test, using the Johansen cointegration test; its results are presented in Table 6. The test results confirmed the cointegration results of the bounds test approach. It showed at least two cointegration relationships among the variables.

Once cointegration is determined using the ARDL bounds testing procedure, the corresponding ARDL–ECM is estimated to obtain long-run effects alongside short-run dynamics. Table 7 presents the long-run coefficients of the ARDL model under an unrestricted constant specification (Case 3). Three variables (M, lag of FX and PP) have statistically significant long-run associations with the CPI. The directions of the relations are consistent with expectations of conventional wisdom. For example, the first row shows the positive elasticity of the CPI with respect to M at 0.18, which means that 1% increase in broad money leads to a rise in the price level of around 0.2%. This aligns with the findings of Friedman and Schwartz (1963), who identified money-price co-movement in

Table 6
Johansen cointegration test

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.** Critical value
None *	0.861560	307.8213	95.75366	0.0000
At most 1 *	0.366913	88.33888	69.81889	0.0008
At most 2	0.182590	37.59556	47.85613	0.3199
At most 3	0.105858	15.21630	29.79707	0.7659
At most 4	0.015297	2.796468	15.49471	0.9753
At most 5	0.009731	1.085400	3.841465	0.2975

Source: Compiled by the authors.

Table 7
Cointegrating coefficients

Outcome variable: CPI				
Variable *	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
M	0.182399	0.021101	8.643890	0.0000
R (–1)	–0.290968	0.201516	–1.443893	0.1516
FX (–1)	0.330364	0.052238	6.324245	0.0000
IM	0.004462	0.016116	0.276849	0.7824
PP (–1)	0.271735	0.037501	7.245987	0.0000

Source: Compiled by the authors.

the long run. The lag of R enters with a negative coefficient, and it is not statistically significant. Specifically, 1% rise in R in the previous month is associated with negative 0.29% lower CPI in the long run. Such an association can be explained by the traditional interest rate channel through contraction of aggregate demand. It is important to note that ARDL models identify associations and long-run cointegration but do not establish causality.

Next, FX in a given month reveals a positive coefficient, which means that 1% depreciation of the Uzbek sum corresponds to a 0.33% high CPI in the subsequent month. Notably, this effect is statistically significant at the 5% level and should be interpreted via exchange rate pass-through. The literature identified similar interactions of FX and CPI, such as studies by Deka and Dube (2021) in Mexico and Malec et al. (2024) in Ethiopia. Moreover, there is no statistically significant level relationship between import volume and price level in the long run between 2016–2025, indicating very marginal elasticity of 0.004%. The lag of PP shows a moderately highly significant association (0.27), consistent with pass-through from upstream costs to consumer prices. Overall, the price level has significant integration with money, exchange rate and producer prices in the long run.

The short-run association among variables is assessed using the short-run form of the ARDL model. Table 8 presents the model results, focusing on ECT and elasticity coefficients. The ARDL (4,0,4,4,0,2) is selected via Akaike Information Criterion (AIC).

Table 8
Error correction model results

Outcome variable: ΔCPI				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
ECT	–0.18	0.02	–7.16	0.0000
ΔR	0.06	0.03	1.96	0.0525
ΔR (–1)	0.08	0.03	2.20	0.0300
ΔFX	0.05	0.01	5.47	0.0000
ΔFX (–1)	0.02	0.00	–4.13	0.0001
ΔPP	0.09	0.01	4.93	0.0000
GFP	0.011	0.33	3.50	0.0007
D1	–4.12	0.58	–7.02	0.0000
D2	0.05	0.12	0.42	0.6710
C	–33.35	4.90	–6.80	0.0000

Source: Compiled by the authors.

ECT had a statistically significant negative coefficient of 0.18, implying that approximately 18% of the previous month's disequilibrium between the CPI and the long-run covariates is offset each month. This suggests a stable association between the price level and the selected variables over the sample. Contemporaneous change of commercial bank lending rate is statistically linked to monthly CPI, and the elasticity constituted 0.06% in the short run. Also, the lagged value of R has a positive association with price level. This signals the efficiency in the second stage of the monetary policy transmission mechanism. The transmission from market interest rates to inflation operates through investment, consumption and the output gap (Mishkin, 1995). The CBU started targeting the interest rate rather than the monetary aggregate since the transition to inflation targeting. Such a regime shift can explain the association of R and CPI. Next, depreciation of the Uzbek sum relative to USD tends to coincide with a higher price level. For example, 1% depreciation is associated with 0.05% higher prices in the short run. The magnitude of elasticity is larger in the long-term than in the short-term. Both current and lag value of FX are linked with CPI in a consistent manner with theoretical expectations, without any puzzles. Next, PP shows a similar pattern: 1% producer price is associated with 0.09% higher CPI inflation. The last variable is global food prices, which showed a marginal interaction in terms of magnitude. Specifically, 1% change in global food prices corresponds to a 0.011% higher CPI in the short run, and such a relationship between global food prices and the CPI is widely documented in empirical studies (Al-Eyd, 2012; Atamanchuk et al., 2025). Hence, the short-run model results suggest that CPI is associated with commercial bank interest rate, exchange rate, producer prices and global food prices in the short run.

The traditional VECM and Engle and Granger causality tests are limited when applied to a short sample and with a mixture of integration of variables. That is why Toda and Yamamoto (1995) suggested an alternative approach when the variables are integrated into different orders. They demonstrated that the modified Wald test follows an asymptotic

Table 9
Toda–Yamamoto causality test results

VAR Granger Causality – Block Exogeneity Wald Tests			
Dependent variable: CPI			
Excluded	*Chi-sq*	*df*	*Prob.*
M	9.2	3	0.0256
R	1.4	3	0.6855
FX	7.3	3	0.0608
IM	1.1	3	0.7763
PP	0.6	3	0.8948
All	20.4	15	0.1551
Dependent variable: M			
CPI	10.2	3	0.0165
R	11.2	3	0.0103
FX	88.2	3	0.0000
IM	5.7	3	0.1242
PP	0.7	3	0.8551
All	130.8	15	0.0000

Source: Compiled by the authors.

chi-squared distribution regardless of the integration or cointegration properties of the series.

In the context of this study, the procedure is as follows: we initially estimated a reduced-form VAR with seven variables and identified a lag of two relying on AIC information criteria. Then, we estimated a new VAR system with three lags (d_{max}). After all, all endogenous variables are entered as exogenous with lag number three, and then the VAR Granger Causality – Block Exogeneity Wald Tests are employed to identify causality (Wolde-Rufael, 2010). Table 9 summarises the causality results with χ^2 and p values. We only presented two cases when CPI and M are outcome variables. In the first case, money ($\chi^2 = 9.2$, $p = 0.0256$) significantly Granger-cause CPI at the 5% significance level. This indicates that past values of money improve forecasts of the consumer price index. However, the remaining variables (R, FX, IM and PP) do not significantly Granger-cause CPI, as their p-values exceed the 5% threshold level. The joint test for all variables made up χ^2 value of 130.8 with 15 degrees of freedom and a p-value of 0.0000. This suggests that the combined lagged effects of all variables significantly influence forecasts of the CPI. When money is the outcome variable in the second case, CPI, R and FX have Granger cause on M, which means that there is a bidirectional causal relationship between the CPI and M. The bidirectional causality aligns with money-led movements in aggregate demand. To be more precise, the faster growth is followed by a higher price level. In all other cases, we could not find any casualty relationship between the CPI and other variables. All in all, money still has predictive power to explain changes in prices in Uzbekistan.

7. Conclusion

Substantial structural reforms have been undertaken in Uzbekistan in order to accelerate the transition process. The liberalisation of the foreign exchange market and the administrated prices in the energy market have catalysed broader transformations in recent years. However, depreciation of the domestic currency and high inflation pose constraints not only on the financial system but also on macroeconomic stability. This study, therefore, investigated how to identify short-run and long-run factors of inflation using the ARDL bounds testing approach. The present analysis used monthly data from January 2016 to August 2025, and the study limited the sample due to the absence of data for some variables prior to 2016. The empirical design is threefold. First, given the mixture of integration in selected variables, the ARDL bound test procedure is applied to verify cointegration among variables. Second, we identified cointegration; therefore, the ARDL regression is specified to recover short-run and long-run associations. Third, the Toda and Yamamoto causality test is employed, considering a small sample and mixed order of integration.

The cointegration relationship is identified using the ARDL bounds test; the computed F-statistic of 8.1 exceeds the upper critical value of 4.6 at 1% significance level. Also, the absolute value of the t-statistic (5.6) is beyond the 1% critical bound. Hence, both tests rejected the null of no level relationship among variables so confirming a stable long-run cointegrating relationship. Additionally, the ARDL estimates show that money and exchange rate, and producer prices have economically and statistically significant long-run interactions with the CPI. Specifically, the elasticity of inflation with respect to money and exchange rate, and producer prices accounted for 0.18 and 0.33, and 0.27 in the long term. However, interest rate and import volume are not significantly associated with the CPI over the long run.

The short-run error-correction coefficient is negative and significant (ECM = –0.18), indicating approximately 18% of the deviation from long-run equilibrium is corrected in each month. The interest rate, exchange rate and producer prices, and global food prices are found to have interactions with the CPI in the short-term, and such interactions are statistically significant, though the magnitude of elasticity is small. Also, the Toda and Yamamoto causality test identified bidirectional causality between money and the CPI; however, other variables did not exhibit predictive power with the CPI.

The findings of the study are policy-relevant. Since inflation rises persistently above the target, a clearer understanding of the dynamic associations between the price level and monetary, non-monetary and external factors strengthens policy design and calibration. Empirical results related to the dynamic relationship between the CPI and drivers of inflation over the short and long term inform the coordination of interest rate, exchange rate and broader macroeconomic policies.

This study has certain limitations that are recommended for further investigation. The output and fiscal expenditures are not selected due to data availability constraints, as these indicators are reported quarterly, while the estimation is made on a monthly basis. Hence, the incorporation of output and fiscal policy variables is quite relevant. Additionally, structural VAR specification can better capture and identify structural causality.

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Government Effectiveness: A Global Comparative Analysis Using World Bank Governance Indicators

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Abstract: This study analyses the effectiveness of government, which is crucial for a stable society, and it examines whether government effectiveness (GE) varies significantly across global regions and income groups. Using the World Bank's Worldwide Governance Indicators (WGI) data over 2023, the study compares differences in GE scores among seven geographic regions and three income groups based on the ANOVA approach and Tukey's HSD post-hoc tests. Due to its comprehensive and up-to-date comparison, the study offers new insights into institutional performance. Results indicated that the quality of GE differs significantly by region and income level. High GE scores consistently belong to high-income countries, whereas low-income countries, particularly those in Sub-Saharan Africa and South Asia, tend to be less effective in this regard. Regional differences also exist, with Europe, Central Asia and North America being more effective than other regions. These results suggested the need for policy enhancement and institutional development in the countries of the underperforming regions. Improving governance is crucial for promoting inclusive growth, enhancing service delivery and achieving certain Sustainable Development Goals.

Keywords: government effectiveness, income groups, World Bank, regional disparities

1. Introduction

Governance is a concept prominently being employed in both public and private sectors. The English expression itself originates from the Latin *gubernare,* which, in turn, is either a cognate with or is derived from the ancient Greek word *kubernaein,* meaning to 'steer' or 'act as a helmsman'.[1] From early on, the term 'governance' was used to refer to the system of guiding and managing a system, prominently a government or some form

[1] See https://logeion.uchicago.edu/κυβερνάω

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of human association. Generally, and in a public setting, governance involves the exercise of invested powers by a country's government to ensure the well-being of its citizens (Lynn et al., 2000; Rahaman, 2024). However, it can be applied both in theoretical outlooks and ideological positions (Hufty, 2011).

The World Bank defines governance as "conditions in a country as a whole" (World Bank, 1994, p. xiv). Accordingly, governance has three aspects: "(i) the form of political regime; (ii) the process by which authority is exercised in the management of a country's economic and social resources for development; and (iii) the capacity of governments to design, formulate, and implement policies and discharge functions" (World Bank, 1994, p. xiv). Similarly, Fukuyama (2013) defines governance as a government's capacity to enact and enforce laws and provide services, irrespective of its democratic status (Fukuyama, 2013). In comparison, Fasenfest (2010) states that governance is the management or leadership of the government through a series of decisions and processes intended to reflect societal expectations.

However, what is of particular significance with a view to commensurability is that the World Bank has adopted the Worldwide Governance Indicators (WGI), which aims to create a quantitative assessment of governance performance in support of establishing policy reforms and monitoring systems. These indicators encompass six governance dimensions across more than 200 countries from 1996 to 2023, including Government Effectiveness (GE), Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law and Control of Corruption (World Bank, 2024).

The WGI framework, developed by Kaufmann et al. (2010), remains the most widely used dataset for assessing institutional quality across countries. However, recent critiques have noted potential limitations in its aggregation methods and perception-based nature, which introduce uncertainty in cross-country comparisons (Langbein & Knack, 2010; Thomas, 2010). The WGI itself reports standard errors and confidence intervals to reflect this uncertainty, underscoring that differences in GE scores should be interpreted probabilistically rather than as exact point estimates.

With these limitations in mind, this study examines the variation in GE across world regions and income level groups to explain the methods and variables underlying institutional variances. As such, it labours to define patterns and examine the correlation between GE and essential socio-economic development indicators, and it analyses significant factors that lead to disparities among nations based on financial classifications. But it also monitors changes in GE over time, hence giving a complete picture of how administrative capacity evolves in different situations.

By GE, a measure of how well people perceive the quality and reliability of state institutions, which includes the quality of the civil service, the quality and availability of public services, the separation of administrative institutions from politics, the quality of policy formulation and implementation, and the overall trust in government promises to deliver policies are being understood. In short, GE refers to how well a government fulfils its duties and promotes the public good, which includes upholding law and order, collecting taxes, allocating funds to meet particular needs, building infrastructure and safeguarding human rights (Sori et al., 2024).

The study of measuring GE is vital for several reasons. First, GE directly relates to the population's well-being, as indicated by the quality of public services indicator (Garcia-Sanchez et al., 2013). Second, economic growth arises from GE and transparency in a globally integrated economic system through the political decision-making process and institutions (Nzama et al., 2023; Şaşmaz & Sağdıç, 2020). Third, GE, which pertains to the quality of policymaking and implementation, is associated with greater support for democracy (Magalhães, 2014). Fourth, GE ensures the rule of law through various mechanisms for life arrangements, including justice, equality before the law, non-discrimination, protection of human rights and freedoms, integrity, transparency, law enforcement, enactment and dispute settlement. Conversely, the rule of law also contributes to fulfilling the requirements for GE. Fifth, effective governments are the focal point for resource distribution, coordination and leadership during crises (Oluwaseyi et al., 2025). And sixth, an effective government can prevent violence against its population, uphold the integrity and efficiency of its bureaucracy, and facilitate the construction and maintenance of infrastructure that supports service delivery and the exchange of goods (Sacks & Levi, 2010).

This study contributes to the literature of GE by providing a fresher and multidimensional understanding of cross-country differences. Whereas previous studies like Garcia-Sanchez et al. (2013), Duho et al. (2020) and Halásková et al. (2023) gave valuable insights into the quality of the determinants of governance but chiefly utilised aged datasets or considered small regional samples, this study applies the most recent 2023 WGI data to trace the post-pandemic trajectory of institutional performance for seven world regions and three income groups. Using a stringent ANOVA–Tukey technique for analysis, the study evaluates whether the differences in governance are statistically significant and how they correspond to the level of economic development. Beyond delineating these differences, it provides policy-oriented interpretations by connecting the empirics to administrative capacity, transparency and institutional resilience-based reforms. Thus, the present inquiry not only refreshes but also expands the empirical comprehension of global governance effectiveness.

2. Methods

2.1. Data

This research uses the WGI data, focusing on GE in 2023. It measures citizens' perceptions along a range of governance dimensions, including the efficiency of public and civil services, the autonomy of administrative bodies from the political sphere, the quality of policy design and execution, and the believability of the government's policy commitments. GE scores range from approximately –2.5 to +2.5 and are standardised on a higher value, indicating greater institutional performance and capacity for governance.

The sample comprises a total of 213 countries from the World Bank's WGI dataset, version July 2023 update. Regional and income groupings are those of the World Bank Atlas's regional grouping. Breakdown of the countries across the regions is as follows: Europe and Central Asia (55), East Asia and Pacific (37), Latin America and the Caribbean

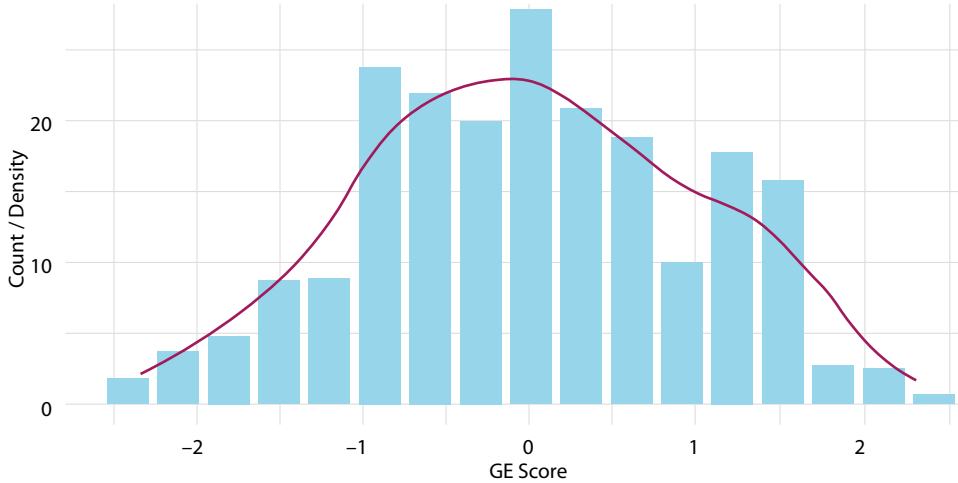

Figure 1

Distribution of government effectiveness (GE) scores across 213 countries (2023)

Note: Histogram showing the distribution of GE index values across all countries in the 2023 Worldwide Governance Indicators (WGI) dataset. The x axis represents the GE score, and the y axis shows the number of countries. The overlaid black line represents a kernel density estimate (Gaussian kernel, bandwidth = 0.30) to illustrate the smoothed distribution.

Source: World Bank, 2024

(41), Middle East and North Africa (19), South Asia (9), Sub-Saharan Africa (49) and North America (4: the United States, Canada, Bermuda and Greenland). Income-grouping categories are as follows: High-income (40), Middle-income (148) and Low-income (26).

The 2023 WGI dataset includes all the nations in full; thus, no nation's observation was left out due to missing government effectiveness (GE) scores.

The dataset encompasses 213 countries, each classified by region (based on the World Bank's seven-region classification) and income level (simplified into three tiers: Low, Medium and High), adapted from the World Bank's income groups.

Figure 1 displays the distribution of GE scores across countries in 2023 using a histogram overlaid with a smoothed density curve. The distribution is approximately bell-shaped, but slightly left-skewed, indicating that while a significant number of countries cluster around the global average (GE ≈ 0), there is a heavier tail of countries with negative effectiveness scores. This suggests that a considerable portion of countries face governance challenges, including low-quality public services, weak policy implementation, or limited bureaucratic capacity. Meanwhile, a smaller but distinct group of countries achieves high GE scores (above 1), reflecting strong institutions and well-functioning public administrations. The figure highlights the global divergence in governance quality, with a clear gap between low- and high-performing nations.

Table 1
Descriptive statistics of data based on regions

Region	Count	Mean	Median	SD	Min.	Max.
Classification by regions						
North America	4	1.263	1.367	0.366	0.764	1.555
Europe and Central Asia	55	0.619	0.713	0.87	−1.206	2.135
East Asia and Pacific	37	0.307	0.232	0.96	−1.753	2.317
Latin America and Caribbean	40	−0.026	−0.006	0.773	−2.225	1.626
Middle East and North Africa	19	−0.303	−0.24	1.13	−2.275	1.604
South Asia	9	−0.389	−0.252	0.766	−1.987	0.566
Sub-Saharan Africa	49	−0.787	−0.848	0.708	−2.328	0.71
Classification by income level						
High	40	1.185	1.202	0.577	0.008	2.317
Medium	147	−0.112	−0.097	0.795	−1.788	2.023
Low	26	−1.192	−1.147	0.691	−2.328	0.388

Note: SD: Standard deviation

Source: World Bank, 2024

To provide a clearer picture of the set of countries considered in this study, I have calculated the summary statistics for the different groups of countries based on the region and income level criteria. The results are provided in Table 1.

The results of descriptive statistics reveal significant heterogeneity in governance effectiveness across both regions and income levels. Notably, North America has the highest average GE score (mean = 1.263), with low dispersion, indicating consistently high institutional capability across the countries in this region. Europe and Central Asia also demonstrate strong governance outcomes (mean = 0.619) but exhibit greater heterogeneity (SD = 0.87), reflecting diversity among some countries. Conversely, Sub-Saharan Africa (−0.787) and South Asia (−0.389) record the lowest regional average scores, signalling weaknesses in systemic public sector quality and policy implementation. The Middle East and North Africa also show a negative regional average GE score (−0.303) and the highest standard deviation (1.13), indicating significant regional variations.

Latin America, the Caribbean, East Asia and the Pacific exhibit intermediate performance, with values close to zero but large variation. The wide gap between the minimum and maximum values across most regions underscores the divergent governance realities within regions, which are influenced by factors such as political stability, administrative professionalism and policy credibility.

The lower part of Table 1 shows apparent disparities in GE across income levels. High-income countries have the highest average GE score (Mean = 1.185), indicating strong institutional quality and governance, with relatively low variability (SD = 0.577). Medium-income countries exhibit a slightly negative average score (Mean = −0.112), indicating moderate governance performance with considerable variation (SD = 0.795). Low-income countries perform the weakest (Mean = −1.192), suggesting significant

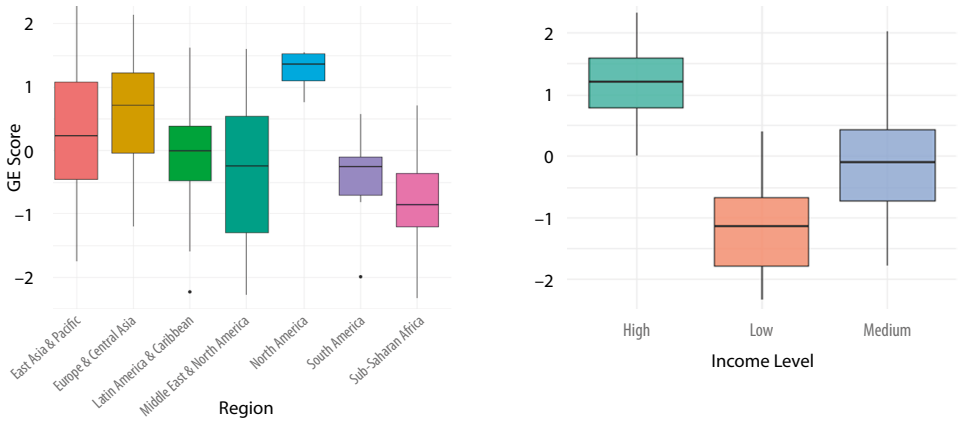

Figure 2

Government effectiveness by region (2023)

Note: This is a box plot comparing GE scores across seven regions. The central line within each box indicates the median, while the box edges represent the interquartile range (IQR). Sample sizes vary by region (ranging from 4 to 55 countries). The figure highlights substantial dispersion across regions, with higher medians observed in Europe, Central Asia and North America.

Source: World Bank, 2024

governance challenges, although variability is slightly lower than that of medium-income countries. These results highlight a strong positive association between income level and GE.

Figure 2 illustrates the distribution of GE scores in 2023 across regions (left panel) and income levels (right panel). The left panel reveals marked disparities across the seven regions. North America, Europe and Central Asia exhibit the highest median GE scores, indicating strong governance institutions and effective public sector performance. By contrast, Sub-Saharan Africa and South Asia display the lowest median scores, with wide interquartile ranges indicating variability in institutional quality within these regions.

The right panel shows that GE scores are positively associated with income level. High-income countries consistently report the highest GE scores, with the majority scoring above 1.0, reflecting efficient bureaucracies and credible policy environments. In contrast, low-income countries tend to cluster around negative values, underscoring the persistent institutional weaknesses. Middle-income countries occupy an intermediate position, characterised by a wider dispersion, indicating uneven governance capabilities within this group. Overall, the figure supports the notion that institutional effectiveness strongly correlates with economic development and regional context. These results support those previously documented by Kaufmann et al. (2010), who emphasise that governance quality and economic growth are closely linked. Also, these findings align with Halásková et al. (2023), who provide recent evidence of this positive correlation in European countries.

2.2. Methodology

This study employs a quantitative research design, utilising statistical processes to test group means comparisons and variation, and determine whether the GE score differs significantly across different regions and income groups. The primary objective is to determine, by using a cross-sectional approach based on 2023 data, whether the GE index differs in the predefined world regions and income groups. Thus, the purpose is descriptive rather than causal.

The primary statistical technique employed is the Analysis of Variance (ANOVA), which is suitable for comparing the means of a continuous variable (GE) across more than two independent groups. In this case, ANOVA is employed to test for differences among seven geographic areas and three income groups (high, medium and low). ANOVA is the appropriate analysis given the number of groups and the objective of identifying overall differences in governance performance. The ANOVA test considers the following hypotheses:

> **H0 (Null Hypothesis):** The mean GE scores are the same across all regions (or income groups).
> **H1 (Alternative Hypothesis):** A noteworthy difference exists between the mean GE scores of at least two groups (regions or income groups).

A significant ANOVA (P-value < 0.05) indicates the rejection of the null hypothesis, suggesting that not all group means are identical and that the differences in GE between the analysed categories are statistically significant.

Following a significant ANOVA result, the study employs *post-hoc* tests, specifically Tukey's Honest Significant Difference (HSD) test, to determine which groups differ. Tukey's HSD is one of the most widely used methods for pairwise comparisons with family-wise error rate control. It identifies which pairs of regions or income groups exhibit statistically significant differences in their GE scores, providing a clearer understanding of where the differences lie. The *post-hoc* results complement the ANOVA results by explicitly stating the sources of variation in GE.

The ANOVA technique was used because it offers a precise and reliable means of determining if government effectiveness differs across more than one group at a time. This study helps compare mean scores across seven regions and three income categories. Simple correlations or regressions that handle only pairs are distinct from ANOVA, which handles more than one category at a single instance and determines whether differences are significant. *Post-hoc* tests, such as Tukey's HSD, help further identify precisely which groups are different from each other. Generally, ANOVA provides a straightforward and helpful way of ascertaining how government effectiveness differs among regions and income levels (Field, 2013; Montgomery et al., 2022; Hair et al., 2020).

3. Results and discussion

3.1. ANOVA test results

Table 2 reports the results of the ANOVA tests used to assess whether GE scores differ significantly across regions and income groups.

Table 2
ANOVA test results

	SS (Sum of Squares)	DF	MSS (Mean Square)	η^2	F-statistic	P-value
ANOVA across regions						
Between groups (region)	64.42	6	10.737	0.30	14.8	0.00
Within groups (residual)	150.21	207	0.726			
ANOVA across income						
Between groups (income)	94.53	2	47.26	0.44	83.03	0.00
Within groups (residual)	120.1	211	0.57			

Note: The table presents the results of the ANOVA tests for the regional and income disparities in GE scores. The "SS" is the sum of squares, indicating the total variability attributable to each factor (region or income) and the residual error. "DF" refers to the degrees of freedom for every source of variation, and "MSS" provides the average variability by splitting the sum of squares by its degrees of freedom. "F-statistic" is the test statistic for determining whether the group means are significantly different from one another, and "P-value" is the statistical significance level. A P-value less than 0.05 shows that the observed differences are statistically significant. For both tests, P-values are 0.00, meaning GE scores vary significantly across regions and income groups at the 1% significance level.

Source: Author's calculation

Starting with the ANOVA by region, the test is statistically significant, with an F-statistic equal to 14.8 and a P-value of 0.00. This enables us to confidently reject the null hypothesis that GE scores are equal across all seven regions. The geographic variation in the mean GE scores does not result from random fluctuation; some regions are better or worse governed than others. The between-group variability (Sum of Squares [SS] = 64.42) is quite large relative to within-group (residual) variability (Sum of Squares = 150.21), again suggesting that geographic disparities in governance are real. Similarly, ANOVA by income level gives an even stronger result. The F-statistic is 83.03 with a P-value of 0.00, indicating a highly significant difference in GE scores between the three income groups. Here, the variation between income groups (Sum of Squares = 94.53) is much larger than the residual or unexplained variation (Residual Sum of Squares = 120.1), suggesting that income group strongly predicts GE. This is to be expected, as wealthier countries have more resources, infrastructure and institutions to help bring about GE.

These results highlight that geographical location and income level significantly explain the variation in GE scores. They pave the way for further analysis, using *post-hoc* tests to identify which geographical locations and income levels differ significantly.

The ANOVA results in Table 2 confirm that GE significantly differs across both regions and income groups, implying that economics and geography play a decisive role in institutional performance. Such evidence conforms to prior findings by Garcia-Sanchez et al. (2013) and Duho et al. (2020), who proved that differences in GE are highly linked to a country's degree of development and administrative capacity. Similarly, Halásková et al. (2023) also demonstrated that wealthier economies in Europe will generally experience stronger GE due to better public-service quality and the professionalism of institutions. However, the current results build upon this evidence, employing the most recent 2023 WGI dataset and evaluating both regional and income group categorisations simultaneously, presenting a more advanced, newer and broader perspective. The high and statistically robust F-values underscore that income level and location remain principal drivers of governance quality globally. This supports the proposition that enhancing administrative capability and policy credibility continues to be critical for reducing institutional disparities between developed and emerging economies.

Table 3 presents the results of the post-hoc pairwise comparison conducted using Tukey's HSD test. The results indicate significant differences in GE between regions and income levels. Sub-Saharan Africa is the only region with significantly lower GE scores compared to East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, and North America. South Asia also scores significantly lower than North America, Europe and Central Asia. These trends reflect enduring gaps in GE in lower-performing regions. From an income perspective, the results clearly demonstrate that high-income countries have significantly higher GE scores than medium- and low-income countries, with medium-income countries outperforming those in the low-income category. These comparisons confirm the strong correlation between income level and GE, highlighting where institutional strengthening is most urgently needed across various regions and income groups.

Post-hoc results in Table 3 reveal significant differences in government effectiveness (GE) between income groups and regions, with the lowest mean scores consistently observed across South Asia and Sub-Saharan Africa. The results point to structural and institutional problems that are rooted deep. Fukuyama (2013) suggests that low bureaucratic capacity, politicisation of the civil service, and limitations in state autonomy commonly hinder policy implementation in developing economies. In Sub-Saharan Africa, weak institutions, fiscal capacities and high foreign aid dependence also undermine governance and collectively reduce policy stability and administrative professionalism (Sori et al., 2024). Similarly, Nzama et al. (2023) blame limited trade openness and institutional reforms for low GE in the developing world.

On the contrary, Europe, Central Asia and North America have higher GE levels due to stronger institutional designs, highly developed bureaucracies and transparent policy institutions (Halásková et al., 2023). These categories have merit-based civil services, stable political environments, and fair checks and balances that increase policy accountability and credibility. Divergence among these categories highlights the role of history-based

Table 3
Post-hoc comparisons of the GE Index using Tukey's HSD Test

	Difference	Lower	Upper	P-adjusted
Comparison by regions				
Europe and Central Asia – East Asia and Pacific	0.3118	–0.2275	0.8512	0.6023
Latin America and Caribbean – East Asia and Pacific	–0.3329	–0.9080	0.2423	0.6012
Middle East and North Africa – East Asia and Pacific	–0.6098	–1.3257	0.1060	0.1518
North America – East Asia and Pacific	0.9559	–0.3791	2.2909	0.3379
South Asia – East Asia and Pacific	–0.6968	–1.6395	0.2459	0.2995
Sub-Saharan Africa – East Asia and Pacific	–1.0942	–1.6466	–0.5418	0.0000
Latin America and Caribbean – Europe and Central Asia	–0.6447	–1.1681	–0.1214	0.0057
Middle East and North Africa – Europe and Central Asia	–0.9217	–1.5967	–0.2467	0.0013
North America – Europe and Central Asia	0.6441	–0.6695	1.9576	0.7681
South Asia – Europe and Central Asia	–1.0087	–1.9207	–0.0966	0.0197
Sub-Saharan Africa – Europe and Central Asia	–1.4061	–1.9043	–0.9078	0.0000
Middle East and North Africa – Latin America and Caribbean	–0.2770	–0.9809	0.4270	0.9040
North America – Latin America and Caribbean	1.2888	–0.0399	2.6174	0.0638
South Asia – Latin America and Caribbean	–0.3640	–1.2976	0.5697	0.9079
Sub-Saharan Africa – Latin America and Caribbean	–0.7613	–1.2982	–0.2245	0.0007
North America – Middle East and North Africa	1.5658	0.1704	2.9611	0.0169
South Asia – Middle East and North Africa	–0.0870	–1.1134	0.9394	1.0000
Sub-Saharan Africa – the Middle East and North Africa	–0.4844	–1.1698	0.2011	0.3543
South Asia – North America	–1.6527	–3.1769	–0.1285	0.0240
Sub-Saharan Africa – North America	–2.0501	–3.3691	–0.7311	0.0001
Sub-Saharan Africa – South Asia	–0.3974	–1.3172	0.5225	0.8576
Comparison by income level				
Low–High	–2.3764	–2.8250	–1.9278	0.0000
Medium–High	–1.2846	–1.6020	–0.9673	0.0000
Medium–Low	1.0918	0.7131	1.4704	0.0000

Note: Table 4 indicates that GE differs significantly across several regions and income levels. Sub-Saharan Africa and South Asia generally have lower GE scores than regions like Europe, Central Asia and North America. In terms of income, high-income countries perform significantly better than both medium- and low-income countries, confirming a strong link between income level and GE.

Source: Author's calculation

path dependencies, education quality and administrative culture in governance outcomes. Experiences of high-performing sub-regions also inform us that institutionalising professional civil services, politically neutralising the state, and building human capital are central to strengthening GE in emerging economies. The consequences, hence, are that increasing effectiveness in governance requires economic capital and institutional changes that build state capacity and accountability.

3.2. Assumptions and diagnostics for ANOVA

To confirm ANOVA results, the underlying assumption of normality is examined using the Shapiro–Wilk tests, and homogeneity of variances is checked using the Levene and Brown–Forsythe tests. The results of these tests are reported in Table 4.

Table 4
Normality and variance homogeneity tests

Shapiro residuals test				
	Statistic	**P-value**		
Region	0.9940	0.5446		
Income_Level	0.9943	0.6005		
Levene test				
	Statistic	**P-value**	**DF**	**DF-residual**
Region	2.5590	0.0206	6	207
Income_Level	2.9324	0.0554	2	211
Brown–Forsythe test				
	Statistic	**DF1**	**DF2**	**P-value**
Region	15.8940	6	108.4434	0.0000
Income_Level	106.2577	2.0000	86.1767	0.0000

Source: Author's calculation

The Shapiro–Wilk tests for model residuals confirmed that normality was not violated for either the regional or income-level models ($p = 0.54$ and 0.60, respectively). However, the Levene and Brown–Forsythe tests indicated partial heterogeneity of variances, particularly across regions ($p = 0.021$ and $p < 0.001$).

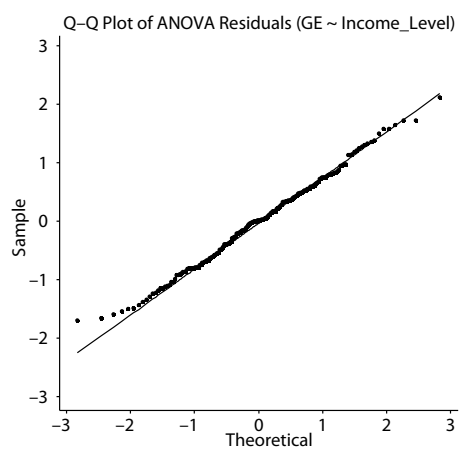

Figure 3
Q–Q plot of ANOVA residuals for GE by income level
Source: Author's calculation

Table 5
Welch ANOVA test results

	Statistic	DF1	DF2	η^2	P-value
Region	21.6486	6	31.9156	0.3	0.0000
Income_Level	119.1729	2	60.8391		0.0000

Source: Author's calculation

Table 6
Games–Howell analysis

Group 1	Group 2	Estimate	Conf. low	Conf. high	P-adjusted
Region					
East Asia and Pacific	Europe and Central Asia	0.3118	−0.2849	0.9086	0.6920
East Asia and Pacific	Latin America and Caribbean	−0.3329	−0.9364	0.2707	0.6350
East Asia and Pacific	Middle East and North Africa	−0.6098	−1.5649	0.3452	0.4290
East Asia and Pacific	North America	0.9559	0.0540	1.8578	0.0370**
East Asia and Pacific	South Asia	−0.6968	−1.7134	0.3198	0.2960
East Asia and Pacific	Sub-Saharan Africa	−1.0942	−1.6652	−0.5232	0.0000***
Europe and Central Asia	Latin America and Caribbean	−0.6447	−1.1524	−0.1370	0.0040***
Europe and Central Asia	Middle East and North Africa	−0.9217	−1.8304	−0.0129	0.0450**
Europe and Central Asia	North America	0.6441	−0.2654	1.5535	0.1830
Europe and Central Asia	South Asia	−1.0087	−1.9969	−0.0204	0.0440**
Europe and Central Asia	Sub-Saharan Africa	−1.4061	−1.8723	−0.9398	0.0000***
Latin America and Caribbean	Middle East and North Africa	−0.2770	−1.1893	0.6353	0.9570
Latin America and Caribbean	North America	1.2888	0.3809	2.1966	0.0100***
Latin America and Caribbean	South Asia	−0.3640	−1.3542	0.6263	0.8450
Latin America and Caribbean	Sub-Saharan Africa	−0.7613	−1.2375	−0.2852	0.0001***
Middle East and North Africa	North America	1.5658	0.5043	2.6272	0.0020***
Middle East and North Africa	South Asia	−0.0870	−1.2626	1.0886	1.0000
Middle East and North Africa	Sub-Saharan Africa	−0.4844	−1.3793	0.4106	0.5980
North America	South Asia	−1.6527	−2.7737	−0.5318	0.0040***
North America	Sub-Saharan Africa	−2.0501	−2.9781	−1.1221	0.0010***
South Asia	Sub-Saharan Africa	−0.3974	−1.3794	0.5847	0.7680
Income					
High	Low	−2.3764	−2.7718	−1.9810	0.0000***
High	Medium	−1.2846	−1.5534	−1.0158	0.0000***
Low	Medium	1.0918	0.7240	1.4595	0.0000***

Note: ** and *** indicates statistical significance at the 5% and 1% levels, respectively.
Source: Author's calculation

Figure 3 presents a Q–Q (quantile–quantile) plot assessing the normality of residuals from the ANOVA model testing differences in GE across income levels. The x axis

represents theoretical quantiles from a standard normal distribution, while the y axis shows the standardised residuals from the model.

Given these unequal group sizes, such as only four observations for North America, Welch's ANOVA was applied as a robustness check (Table 5). The Welch tests yielded the same overall significance patterns as the classical ANOVA ($F = 21.65$ for regions and 119.17 for income groups, $p < 0.001$), confirming the stability of the findings.

Because homogeneity was not fully satisfied, *post-hoc* comparisons were performed using the Games–Howell procedure, which does not assume equal variances. Table 6 presents mean differences with 95% confidence intervals and adjusted P-values controlling the family-wise error rate. Effect sizes were calculated using η^2 to indicate the magnitude of differences ($\eta^2 = 0.41$ for regions and 0.49 for income levels), representing significant effects according to Cohen's (1988) benchmarks. Together, these diagnostics and robust procedures ensure that the reported significance levels are reliable and not driven by heteroskedasticity or multiple-testing bias.

3.3. Panel analysis between 1996 and 2023

To complement the cross-sectional results, a graphical panel-based analysis is conducted in this section to monitor the evolution of GE by geographic area and income group from 1996 to 2023. Figures 4 and 5 plot the time trends in the mean GE scores to visualise whether institutional performance has converged or diverged between groups over nearly three decades.

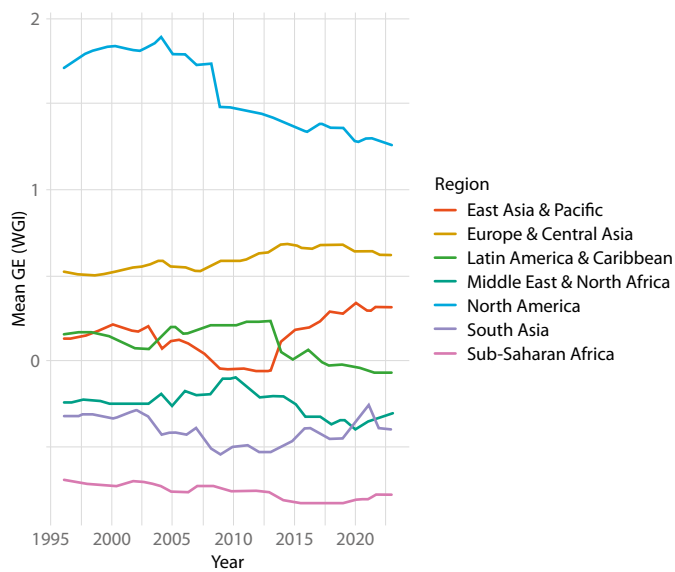

Figure 4

Trend of government effectiveness by region (1996–2023)

Source: World Bank, 2024

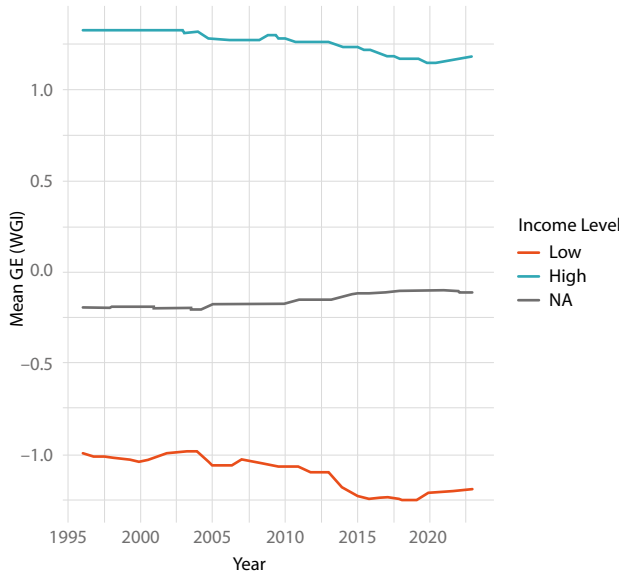

Figure 5
Trend of government effectiveness by income level (1996–2023)
Source: World Bank, 2024

Regional trends reveal a persistent divergence in institutional performance globally. Throughout the entire span, North America boasts the highest GE scores, substantially more than 1.5, reflecting long-standing institutional stability and superior administrative capacity. On the other hand, Europe and Central Asia follow with consistently high but somewhat lower scores, reflecting robust governance structures in most European countries and gradual improvement among transition economies.

South Asia and Sub-Saharan Africa are once more on the lower end of the distribution, with GE values consistently negative, indicating poor policy implementation, service delivery and public administration.

The East Asia and Pacific region are in the middle with stable performance. At the same time, Latin America and the Caribbean and Middle East and North Africa exhibit higher volatility, which means political change, reform, or instability at times.

Generally, no convergence is seen: the distance between high-performing and low-performing countries is vast, which suggests that institutional improvement has been uneven all over the world.

The trends based on income further highlight the structural relationship between economic development and governance capacity. The high-income nations consistently show the highest GE values, well over 1.0 throughout the entire period, with barely a wiggle, pointing to the stability of the leading institutions. On the other hand, low-income countries possess negative GE values (of around −1.0), and their trend shows scant long-term advancement, suggesting that efforts at capacity building and governance reform have not yet yielded lasting gains. The middle-income category stands at an intermediate level,

but the moderately increasing trend indicates step-by-step institutional strengthening in developing economies.

These trends support the two-way ANOVA results, which indicated that income level accounts for a greater proportion of the variance in GE than regional classification.

Overall, the panel analysis reinforces that economic development continues to be the primary driver of institutional performance, with regional context contributing secondary but enduring differentiation. Even after global governance efforts, institutional divergence between wealthy and low-income countries has remained astonishingly consistent over the past three decades.

3.4. Two-way ANOVA results

To further the analysis and ascertain how the GE is distributionally related to geographic area and income level, I have conducted a Two-way Analysis of Variance (ANOVA). This process extends the earlier one-way comparisons by examining the mean differences within GE through region and income level, and the interaction effect between the two variables.

Two-way ANOVA is particularly appropriate here because the data spans more than one categorical grouping, allowing for the investigation of main effects (accounting separately for each variable) and potential interaction effects, i.e. whether the impact of income level on GE differs by region.

Table 7
Two-way ANOVA results

Term	SS	DF	Statistic	P-value
Region	125	6	77.7	0.000
Income level	230	1	856	0.000
Residuals	433	1615		

Source: Author's calculation

The model was estimated based on cross-country panel data from 1996 to 2023, consistent with the World Bank's Worldwide Governance Indicators framework. Normality and equal variances assumption were tested before estimation, and the Welch and Games–Howell corrections were applied where necessary. Output from the two-way ANOVA is presented in Table 7.

The analysis reveals highly significant main effects of region and income level on the effectiveness of government ($p < 0.001$). Almost exclusively, the income level effect ($F = 856.0$) is significantly more substantial compared to the regional effect ($F = 77.7$), which suggests that cross-country differences in the state of economic development explain individually more of the global heterogeneity in institutional quality than do geographic conditions alone.

This is consistent with prior studies (Kaufmann et al., 2010; Rodrik, 2019), which highlight the fact that more advanced economies usually have more effective bureaucracies, superior regulations and more effective mechanisms to implement policies.

Even if inter-regional differentials also enter the picture, they are considerably lesser, hence institutional differentials between income groups but within regions are nearer.

For instance, East Asian and European upper-middle-income countries manage to achieve the same governance performance but with different political and historical trajectories. On the other hand, low-income and lower-middle-income countries, substantially within Sub-Saharan Africa and South Asia, have persistently lower GE scores, indicating continued difficulties with administrative capabilities, control over corruption and service delivery.

Overall, the two-way ANOVA results confirm the previous finding that economic capacity and regional context together determine institutional performance, but also indicate the size of the income effect to reveal that economic growth continues to be the overarching cause of government effectiveness globally. These comparisons showcase the relevance of specific policy interventions, such as the professionalisation of the civil service and transparency reforms, virtually exclusively in the developing regions where institutional capacity deficits are significant.

3.5. Discussion

This article provides an in-depth overview of GE by world region and income group, based on the latest 2023 scores from the World Bank's Worldwide Governance Indicators. The results reveal significant regional and economic disparities in institutional quality, with important implications for both domestic policy and international development strategy. This result is consistent with Garcia-Sanchez et al. (2013), who noted that some studies have suggested that the factors explaining the GE, which exhibit differences across various countries, include geographic location, legal origin, level of economic development and government features. Conversely, Garcia-Sanchez et al. (2013) argued that the organisational environment, closely linked to economic growth, or the populace's demands, are the primary factors influencing governance. The comparison confirms that Europe, Central Asia and North America have the highest GE. The countries of these areas tend to combine professional civil service, sound public administration and realistic policy frameworks. North America, in particular, recorded the highest mean value and low dispersion of values, reporting high and comparatively homogeneous institutional quality for the region. These results align with traditional arguments that strong institutions are both a cause and a consequence of long-term economic success.

Sub-Saharan Africa and South Asia exhibit much lower average effectiveness scores. Countries in these regions encounter severe challenges, including administrative inefficiency, a weaker rule of law, lower state capacity and greater political instability. This result aligns with Sori et al. (2024), who noted that economic growth in Sub-Saharan Africa is favourably and dramatically impacted by government effectiveness. Similarly,

Isser et al. (2024) indicated that Sub-Saharan Africa has experienced a series of governance reform failures and policy reversals, with numerous nations continuing to endure the repercussions of inadequate governance (Isser et al., 2024).

The significant disparity between the governance performance of these two regions and higher-performing areas highlights a persistent development gap that institutional reforms alone have not closed. Additionally, the varied scores within regions such as East Asia and the Pacific, and Latin America and the Caribbean, suggest that the average quality of governance is lower and highly unequal, leading to internal imbalances that can exacerbate social and economic disparities within these regions. This result, concerning the Pacific scores, aligns with the observations of Howes (2019), that among the 76 World Bank evaluations conducted in 2018, 27 (approximately one-third) were classified as fragile, as their governance scores were below 3.2, indicating inadequate governance (Howes, 2019).

When comparisons are made across income groups, the relationship becomes even clearer: high-income countries occupy the upper end of the distribution of GE, while low-income countries cluster around negative values. The strong bivariate connection between income level and institutional quality suggests that building robust governments is both essential for and a result of economic development. Mahran (2023) stated that governance statistically impacts economic growth (Mahran, 2023). The wide range of scores for middle-income countries reflects various experiences in strengthening institutions. Some economies succeed in modernising public services, while others remain impeded by governance bottlenecks.

These results are consistent with previous studies, such as those of Duho et al. (2020), which found that economic wealth significantly impacts GE. However, Garcia-Sanchez et al. (2013) concluded that the organisational environment, which is linked to educational attainment and economic development, is the primary factor explaining why governments are effective. Political restraints and certain organisational traits, such as gender diversity and government size, may ultimately enhance governance quality, depending on the country's income distribution. Haláskova et al. (2023) confirmed that GDP per capita and government spending on public services are the two primary factors determining GE.

Women's representation in parliament, the Corruption Perception Index and the proportion of women in high administrative roles are additional variables that significantly affect government efficacy in transition economies. Ezako (2024) emphasised that strong governance has a positive impact on human development. Similarly, Yang (2010) added that higher levels of human development are positively connected with a more efficient government. The distribution of the average GE scores exhibits a mild left skewness, which corroborates the fact that, although most countries cluster around the world mean, quite a few have below-average governance. This highlights the need for selective reform that is tailored to different situations.

The regional variations in the efficiency of government are seen to appear to be highly correlated with income and education variations. As in previous works (La Porta et al., 1999; Kaufmann et al., 2010), wealthier nations are found to have more effective governance outcomes because higher levels of income allow for the employment of better civil servants, allow for digitalisation of the civil service, and retain merit-based

bureaucracies. In addition, human capital development reinforces administrative potential and policy coherence, thus further reinforcing the income-governance nexus. The two-way ANOVA results confirm that when controlling for income level, the majority of cross-region heterogeneity in GE is decreased, echoing the fact that economic and education advancement are central drivers of institution quality.

The relationship between economic growth and governance is two-way. On the one hand, wealthier economies have more ability to invest in efficient bureaucracies, a better rule of law and ensure firm policy enforcement. On the other hand, good governance yields long-term economic growth because it renders an environment stable and conducive to investment, enhances efficiency and reduces corruption, as Acemoglu and Robinson (2012) highlight. Economic development and institutions evolve together, long-term, mutually reinforcing one another (Acemoglu & Robinson, 2012). Thus, the substantial income–governance correlation found in this study must be interpreted less as an assertion of causality and more as evidence of interdependence, in which economic and institutional progress are intertwined with one another.

3.6. Policy implications by region

Regional and income-group analysis of government effectiveness has many policy implications for institutional strengthening and governance reform.

In case of East Asia and the Pacific, the region has maintained steady performance in GE since the late 1990s, mainly through investments in administrative effectiveness and technological uptake. Successive refinements will entail further intensified digital governance initiatives, enhanced transparency mechanisms, and governance of accelerated economic growth through corresponding strong institutional accountability.

In Europe and Central Asia, high scores on the GE in this dimension reveal well-established administrative environments and effective civil services. However, innovativeness on the public sector side and inter-country policy infrastructure remain outside the sphere of smooth functioning. Policymakers should invest in transparent government reforms and performance-oriented civil services to consolidate gains.

Despite moderate scores on the GE in Latin America and the Caribbean, the countries still suffer from long-standing woes about the bureaucracy's and public institutions' inefficiencies. Shifting civil service professionalism up, reducing political clientelism, and decentralising the provision of services can boost responsiveness and accountability.

In the Middle East and North Africa (MENA), institutional performance is highly variable and usually limited by centralised control and unpredictable policy. A great deal of emphasis is needed to develop the capacity within the public administration system, create policy consistency, and ensure public–private partnership to gain credibility and efficiency.

Despite GE levels being the highest worldwide in North America, recent volatility underscores the significance of continuing public sector innovation and public trust. Spending on adaptive governance, ongoing civil servant development and citizen-focused service models can help retain institutional resilience.

In South Asia, the regional nations have gradually enhanced the standard of GE but still suffer from Structural Capacity Shortfalls. Institutional growth will be maintained through the strengthening of merit-based recruitment procedures, sub-district delivery mechanisms, and e-government infrastructure.

Finally, Sub-Saharan Africa consistently has the lowest GE scores and is also marked by systemic inadequacy in administrative capacity and a lack of resources. High-priority reforms include professionalising the civil service, anti-corruption efforts, and strategic investments to enhance the quality and credibility of the government.

4. Conclusion

The main objective of this study was to determine whether GE varies significantly across world regions and income classes. Using ANOVA and *post-hoc* statistical analysis, we examined the influence of geography and economic classes on the quality of governance, as measured by the GE index.

The data clearly shows that GE is not always present globally. Income countries are always depicted with higher GE scores, showing better institutions, improved public sector governance and more effective policy implementation. Low-income countries, particularly those in Sub-Saharan Africa and South Asia, tend to have lower governance effectiveness scores. Regionally, Europe, Central Asia and North America perform better than the rest of the world, while others, such as Sub-Saharan Africa, consistently lag behind the global average.

The results have important policy implications for policymakers across low- and middle-income countries. Enhancing civil service institutions, ensuring policy coherence and promoting merit-based selection are essential for enhanced administrative performance. Promoting their services' quality and transparency mechanisms may also foster confidence among citizens and efficiency. Selective investment in education, information technology governance, and human capital development may also promote the institutions' resilience and capacity.

These contrasts have far-reaching policy consequences. Increasing the GE needs to be a strategic priority, especially for low-performing nations and areas plagued by inherent institutional deficiencies. Policymakers in low-performing nations must invest in enhancing administrative capacity, transparency and accountability to improve the quality of governance. Targeted international support through aid, capacity-building programs and institutional relations can also help close the governance gap between high- and low-income nations. Lastly, GE is not just about improving bureaucracies; it is a key driver of sustainable development, public confidence, and long-term political and economic stability. Closing the governance gap is crucial for achieving inclusive growth and enabling all countries to address global challenges more effectively.

Even though the research has sound empirical evidence, it has its limitations. First, the analysis depends on the cross-sectional data of a single year (2023), which will affect the investigation of the temporal dynamics or causal relationship. Second, the research must rely on perception measures that are highly popular but prone to subjective biases.

For future studies, this research may be extended by making use of panel data for investigating the temporal dynamics of GE and by using further institutional factors such as corruption control, political stability, or quality of regulation.

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Transparency or Apparent Transparency in Dutch Municipalities

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Abstract: This study focuses on the extent to which Dutch municipalities' decisions to make personal policy views public actually lead to greater transparency. The research finds that council members perceive increased transparency as a consequence of such decisions. However, the study also observes that administrative resistance may arise against the decision to disclose personal policy views. This resistance has various causes and can take different forms. Some forms of resistance are recognised by council members, while others are not. In the latter case, a degree of apparent transparency may emerge. The use of these unnoticed forms of resistance is strongly associated with the type of disclosure decision that is made. For example, in all cases where the decision was taken to actively disclose all communication, certain information is emphasised, and oral consultation is intensified.

Keywords: transparency, resistance, municipal transparency, apparent transparency

1. Introduction

Since the onset of the global transparency movement, the demand for transparency within public organisations has increased, and Freedom of Information legislation has expanded significantly (Grimmelikhuijsen et al., 2019; Tejedo-Romero & Ferraz Esteves Araujo, 2023). This development has also taken hold in the Netherlands. Following several high-profile incidents with substantial societal impact, the Dutch Parliament's trust in the Government declined. In response, the Open Government Act (hereinafter: Woo) was established to improve and make more transparent the flow of information from government organisations to elected representatives (Dutch Parliament, 2021).

The Woo grants universal access to public information without requiring a stated interest, besides certain legal limitations (Article 1.1, Woo). It aims to enhance access to government information, promote active disclosure and increase administrative transparency, and it applies to all administrative bodies, including municipal administrative

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entities (Article 2.2, Woo). The Woo has implemented a marked reform compared to the former regulation, namely, it has an emphasis on active information provision. Administrative bodies are required to proactively disclose information, unless the interest served by disclosure is outweighed by the need to ensure the proper functioning of the administrative body (Article 5.1, Woo).

The Act prescribes several information categories that must be actively disclosed (Article 3.3, Woo), yet, in principle, personal policy opinions do not fall under this obligation. Personal policy opinions refer to civil servants' advice, views, positions, and deliberations intended for internal consultation (Article 5.2, Woo).

Municipalities may, beyond their legal obligations, choose to make additional information publicly available. This may also include internal policy opinions made accessible in an anonymised form (Article 5.2, Woo; Vereniging van Nederlandse Gemeenten, 2022). This may pertain, among other things, to proposals submitted to the municipal board, policy memoranda, meeting minutes, and other forms of written communication between civil servants and members of the board. The Administrative Jurisdiction Division of the Council of State regards the decision to disclose personal policy opinions as a discretionary power of the relevant administrative body (Tweede Kamer der Staten-Generaal, 2021, p. 62).

In certain municipalities, the municipal council or the board has indeed adopted decisions that go beyond legal requirements, opting to disclose policy opinions in an anonymised form. The scope of such decisions varies. In some cases, only proposals submitted to the board are disclosed upon request (passive disclosure); in other cases, in addition to board proposals, other forms of written administrative advice are proactively provided to the municipal council, such as decision memoranda.

There is a broad consensus that transparency can be regarded as a core element of good governance (Hood, 2006a; Grimmelikhuijsen & Meijer, 2014; Bauhr & Carlitz, 2021; Desmidt & Meyfroodt, 2021; Schnell et al., 2024), and transparency may lead to higher trust in government and even provide greater legitimacy to democratic governments (Tejedo-Romero & Ferraz Esteves Araujo, 2023). It may also enhance the performance of public administrations (Zagrapan & Spáč, 2022; Li, 2023).

However, it is important to take into account possible resistance to transparency as well (Fernandez & Rainey, 2006; Hood, 2007; Reginato et al., 2016; Rho et al., 2021; de Boer et al., 2018; Li, 2023; Schnell et al., 2024). Transparency can strengthen the position of 'outsiders' and correspondingly weaken the position of 'insiders' (Lewin, 1947; Meijer, 2007; Wirtz et al., 2016; Li, 2023). Such resistance may lead to information being withheld or manipulated (ter Bogt, 2001; Groot & van Helden, 2003; Aardema, 2005; Hood, 2006a; Hood, 2007). And withholding or manipulating information can result in apparent transparency: an increased perception of transparency, without any viable increase in actual transparency.

Extensive research has been conducted on the effects of legislation on transparency and on factors that may influence the degree of transparency (Meijer, 2013; Tavares & da Cruz, 2017; Grimmelikhuijsen et al., 2019; Zagrapan & Spáč, 2022; Tejedo-Romero & Ferraz Esteves Araujo, 2023). Considerable attention has also been paid to administrative resistance (Hood & Peters, 2004; Hood, 2007; Bouckaert & Halligan,

2008; Van Dooren et al., 2010; Lundy, 2013; Wirtz et al., 2016). However, there is less quantitative research available on potential resistance to efforts aimed at increasing transparency within Dutch municipalities and on the phenomenon of apparent transparency that may result from such resistance. Research on transparency within municipalities mainly focuses on information that is made public (Zagrapan & Spáč, 2022). While this type of research can provide insight into transparency, it offers a less comprehensive understanding of resistance and apparent transparency, as it requires insight into information that is not disclosed. Given the importance of transparency for good governance, this contribution aims to address this gap. This article, therefore, focuses not only on the extent to which the decision by municipalities to disclose personal policy views leads to an increase in transparency as perceived by the municipal council, but also on the extent to which this decision may potentially result in apparent transparency. It explicitly examines possible resistance to the disclosure of personal policy views, the causes of such resistance, and its consequences for actual transparency.

The study was guided by the following research question: To what extent does the decision by municipalities to disclose policy views lead to an increase in transparency, and what are the consequences of potential resistance to this decision for the degree of transparency?

To answer this question, the various disclosure decisions adopted by municipalities are first analysed and classified. Subsequently, the extent to which different types of disclosure decisions have resulted in a perceived increase in transparency is examined. These decisions are then related to the magnitude of resistance encountered. Next, the analysis focuses on the possible causes of resistance, considering to what extent different causes of resistance may lead to distinct forms of resistance.

Finally, the relationship between forms of resistance and experienced increases in transparency is explored. The underlying assumption is that resistance may lead to reduced transparency, and that when forms of resistance go unnoticed by council members, a situation of apparent transparency may arise. In such cases, council members may believe that, in accordance with the decision, more original information is being provided in a timely and accessible manner, while in reality, the information is not original, complete, timely, or accessible. Consequently, council members may perceive an increase in transparency, even though actual transparency has not increased.

This contribution begins with a theoretical exploration, providing a more detailed interpretation of the concepts of transparency and resistance to transparency, its potential causes, and the various forms it can take. Following an exposition of the research object and design, the results of the study are presented and analysed. This article concludes with several conclusions and a prelude to discussion.

2. Theoretical exploration

2.1. Towards a definition of transparency

Transparency refers to "lifting the veil of secrecy" (Davis, 1998, p. 121). Following Grimmelikhuijsen (2012), transparency in this study is defined as the availability of information about an actor that allows other actors to monitor the workings or performance of the first actor. This definition consists of an institutional relation in which an information exchange takes place that relates to the workings or performance of an actor (Grimmelikhuijsen 2012; Meijer, 2013, p. 430; Zagrapan & Spáč, 2022).

Transparency is generally interpreted as information transparency, which is unsurprising given that the importance of transparency has been explicitly highlighted by the 'right to information' movement (Schnell et al., 2024). Information transparency can be understood as the active or passive disclosure of information by public organisations. The disclosure of information can serve various objectives. Public organisations may aim to promote participation, improve service quality, reduce corruption, or enhance legitimacy by making information public (Piotrowski & Van Ryzin, 2007; Archel et al., 2009; Bauhr & Carlitz, 2021). Disclosing information enables citizens and representatives to verify the actions of public organisations, and it is generally assumed that this contributes to the efficiency and effectiveness of government operations (Bauhr & Grimes, 2014; Desmidt & Meyfroodt, 2021; Tejedo-Romero & Ferraz Esteves Araujo, 2023). From a principal–agent perspective, the disclosure of information reduces information asymmetry (Bauhr & Carlitz, 2021; Li, 2023). In nearly all cases, the ultimate aim of disclosing information is to increase transparency and trust in public organisations (Li, 2023; Tejedo-Romero & Ferraz Esteves Araujo, 2023; Schnell et al., 2024).

Public organisations may, on their own initiative, decide to disclose certain information. The risk, of course, is that only positive information is made public (Archel et al., 2009; Desmidt & Meyfroodt, 2021; Li, 2023). For this reason, Freedom of Information laws are increasingly being established at the national level, aiming to make information more public and accessible (Grimmelikhuijsen et al., 2019; Desmidt & Meyfroodt, 2021; Tejedo-Romero & Ferraz Esteves Araujo, 2023). Such laws may require the disclosure of performance indicators, minutes, preparatory decision memos, or administrative records (Piotrowski & Van Ryzin, 2007; Li, 2023).

Legislation aimed at making information public can result in an increased focus on negative information, as positive information is generally disclosed voluntarily (Li, 2023). In this context, it is also observed that legislative bodies tend to pay more attention to negative information or to parts of the organisation that appear to be underperforming (Hood, 2007). This emphasis on negative information can lead to blame avoidance (Hood, 2007; Li, 2023). The disclosure of information may then result in risk-averse behaviour at various levels within the public organisation, with media attention playing a significant role in this process (Desmidt & Meyfroodt, 2021). If the tendency toward blame avoidance is high, the disclosure of information can lead to perversity, that is, reverse effect outcomes, in which the result is the opposite of that intended by reformers (Hood, 2007).

In this context, the phenomenon can be described as apparent transparency: the recipient perceives an increase in transparency, while actual transparency has not increased.

2.2. Towards a definition of resistance

Although extensive research has been conducted on the phenomenon of resistance, the concept lacks a uniform definition (Hollander & Einwohner, 2004). In the social sciences, resistance is often conceptualised as an opposing movement (Wirtz et al., 2016). Resistance, therefore, operates on the same mechanisms as the movement it opposes but moves in the opposite direction (Kotter & Schlesinger, 1979; Nisar, 2018; Jenhaug, 2020). This perspective ties resistance to power dynamics and frames it as an effort to reconfigure power relations (Foucault, 1980; Frank, 2012; Wirtz et al., 2016; Nisar, 2018). Some researchers situate resistance in the context of change and define it as any action aimed at maintaining the *status quo* when that *status quo* is threatened by change (Lewin, 1947; Zaltman & Duncan, 1977; Hollander & Einwohner, 2004; Wirtz et al., 2016). Given this study's specific focus on resistance to the disclosure of information, this latter definition is endorsed.

In public administration research, administrative resistance to the disclosure of information is frequently observed but is often interpreted as deviant behaviour or perversity (Groot & van Helden, 2003; Hood, 2007). Various authors propose different causes at different levels for administrative resistance (Goodpaster & Matthews, 1982; Carpenter & Feroz, 2001; Reginato et al., 2016; Jenhaug, 2020). For one, providing information may conflict with existing external laws and regulations (Janssen et al., 2012). Or, at the organisational level, administrative procedures, hierarchical structures and the cultures within government organisations may obstruct intended changes (Haselbekke, 1990; MacManus, 2002; Pasquier & Villeneuve, 2007; Buurman et al., 2009).

Previous research has identified various causes for the emergence of administrative resistance to the disclosure of information at the individual level (Fernandez & Rainey, 2006; Nisar, 2018; Rho et al., 2021). Employees may resist disclosure when they perceive a potential loss of influence, status, or other valued aspects (Kotter & Schlesinger, 1979; Reginato et al., 2016; Jenhaug, 2020). Inadequate communication or low confidence in management or the representative body initiating the disclosure can also lead to resistance (Kotter & Schlesinger, 1979; Fernandez & Rainey, 2006; Rho et al., 2021). Additionally, employees may evaluate the pros and cons of disclosure differently from the initiator (Kotter & Schlesinger, 1979).

Resistance can arise if employees doubt their ability to develop skills required by the decision to disclose information (Kotter & Schlesinger, 1979). And fundamental resistance occurs when the norms pursued by the disclosure are not shared (Howlett et al., 2020). New rules resulting from disclosure may be perceived as burdensome and non-functional, leading to resistance (Bozeman, 1993; DeHart-Davis & Pandey, 2005; Moynihan & Pandey, 2007; Welch & Pandey, 2007; Brewer & Walker, 2010; Torenvlied & Akkerman, 2012). And potential resistance from managers themselves is a relevant factor as well (Burns & Scapens, 2000; Pronk, 2003; Gelderman et al., 2006), explained

through agency theory or divergent interests and perceptions (Merchant & Rockness, 1994; Kaplan, 2001; Hooghiemstra, 2012; Shrives & Brennan, 2015; Li, 2023). Another cause for administrative resistance to disclosure at the individual level stems from the inherent resistance to control (Bozeman, 1993; van Helden, 1999; Burns & Scapens, 2000; Aardema, 2010; Robalo, 2014; Ruimschotel, 2014). Particularly when disclosure is perceived as increasing control, there is a heightened risk of resistance and dysfunctional behaviour (Ouchi, 1979; Briers & Hirst, 1990; Lapsley & Pettigrew, 1994; Hood, 2006b; Anderson & Maks, 2012; de Boer et al., 2018; Li, 2023). Additionally, resistance to perceived control arises when legitimacy is not ascribed to the controlling entity (Howlett, 2018). An inherent tendency toward blame avoidance can also be a cause of resistance to the disclosure of information (Hood, 2007).

Scholars distinguish various types of resistance. It can manifest as material or physical resistance, such as organising protest marches or establishing blockades, but resistance can be purely communicative too or just symbolic in nature, with even silence potentially constituting a form of resistance. It can be individual or large-scale, with varying degrees of coordination (Nisar, 2018). Resistance may be directed against a natural person or be institutionally oriented (Hollander & Einwohner, 2004). A notable type of resistance involves some purposeful action against a particular change, deliberately concealed from those initiating the change. This type is characterised as strategic resistance, also known as hidden resistance (Hollander & Einwohner, 2004). In efforts to increase transparency in government organisations, this form of strategic resistance is frequently observed (Pasquier & Villeneuve, 2007).

Efforts to increase the disclosure of information within the public sector may evoke various forms of strategic administrative resistance (Anderson et al., 2010; Hendrickson & Grey, 2011). For instance, the provision of information may be intentionally delayed to hinder its disclosure (Groot & van Helden, 2003; Hood & Peters, 2004; Klijn et al., 2006; Aardema, 2010). Strict adherence to procedures may also constitute a form of administrative resistance. Furthermore, scholars have pointed to the phenomenon whereby civil servants focus solely on optimising the indicators observed by the controlling body (Ouchi, 1979; Pollitt, 1993; Brignall & Modell, 2000; Hood & Peters, 2004; Aardema, 2005; Anderson, 2006; Bouckaert & Halligan, 2008; Van Dooren et al., 2010; Herweijer, 2010).

Other researchers describe principal–agent patterns or alternative forms of tactical behaviour, such as deliberately refraining from recording information or providing an excess of information ("snowing"; cf. Hood, 2007). In extreme cases, this may involve information manipulation and the creation of shadow records to minimise or conceal the unfavourable information (Hopwood, 1972; Hopwood, 1973; Hood, 2006a; Bouckaert & Halligan, 2008; Nisar, 2018). The use of oral communication to avoid written documentation, as well as the use of easily disposable Post-it notes, are also identified as forms of opposition in this context (Gilliland & Manning, 2002; Groot & van Helden, 2003; Hood, 2007; Rho et al., 2021).

The theoretical exploration outlined above leads to the central expectation that the decision to disclose civil servants' policy views induces forms of strategic bureaucratic resistance, and that these forms of resistance, in turn, result in apparent transparency.

3. Conceptualisation

3.1. The disclosure decision

To delineate the scope of the disclosure decision, two variables are distinguished: policy opinions may be disclosed either passively or actively. In the case of passive disclosure, written policy opinions are only provided after a formal request has been submitted; in the case of active disclosure, these policy opinions are attached as annexes to the relevant council proposal. In addition, the disclosure decision may pertain exclusively to board proposals prepared in anticipation of a council proposal, or it may extend to other forms of written communication between a civil servant and a member of the board that relate to the council proposal (Zagrapan & Spáč, 2022). For the purposes of this study, such broader disclosure decisions must, at a minimum, include underlying decision memoranda that do not constitute part of the board proposals themselves. This results in a typology presented in Table 1.

Table 1
Various decisions to disclose personal policy views

	Passive	**Active**
Only personal policy views included in board proposals	A: Board proposals are made public upon request	C: Preparatory board proposals are attached as an appendix to the relevant council proposal
Personal policy views included in any form of written communication	B: Upon request, as much written communication as possible between a member of the board and a civil servant concerning a specific administrative matter is disclosed	D: At a minimum, the decision memoranda prepared by a civil servant that pertain to a specific council proposal are attached as annexes to that council proposal

Source: Compiled by the author.

This gives rise to four types of decisions that differ not so much in an ordinal, but rather in a nominal sense. For example, it cannot be said that the active disclosure of board proposals is necessarily more far-reaching than the passive disclosure of a broad range of written communications. In contrast to council proposals, board proposals, decision-making memoranda, and other forms of written communication generally include personal policy views.

3.2. Forms of resistance

Following the forms of strategic resistance distinguished in the literature, this study also differentiates between various forms of strategic resistance.

To recognise and distinguish these forms of strategic resistance from each other, one must understand the disclosure process within a Dutch municipality. Within Dutch municipalities, written communication about policy views that may be subject to

disclosure is archived. This archiving can take place centrally, but is usually done decentrally: each civil servant is responsible for their own archiving. In the context of active information provision, these personal policy views are appended as an attachment to the council proposal to which they pertain. In instances of passive information provision, these personal policy views are furnished upon request.

The first category of strategic resistance can be classified as bureaucratic behaviour: for instance, deliberately delaying the disclosure of policy views. In such cases, policy views are made public on the latest possible date. Additionally, in passive disclosure, repeatedly asking follow-up questions to the requesting party may indicate bureaucratic behaviour. The requesting party is then asked to elaborate on the background of the request or to explain how the request relates to General Data Protection Regulation (GDPR) provisions, even though these provisions might not be relevant to the disclosure of policy views. In both cases, the personal policy views are ultimately disclosed, but certainly not prematurely.

Tactical behaviour is identified as the second form of strategic resistance. Essentially, this form of resistance involves optimising only the factors that are observed. In the disclosure of policy views, only written communication is observed and made public. In this form of resistance, this written communication is meticulously screened, edited or omitted before being archived.

The third type of strategic resistance pertains to the manipulation of information. While tactical behaviour relates to information that still needs to be archived, information manipulation concerns information that has already been archived and subsequently needs to be made public. Information manipulation can take the form of providing incomplete information. In this form, certain archived policy views are deliberately not disclosed, even though they should be. Altering policy views after the documents have been archived can be considered as providing incorrect information. Correspondence is then rewritten. Information manipulation can also take the form of distorting the message. For example, an overload of information is deliberately made public: all memos, underlying documents, and all email and WhatsApp traffic are then offered to the requester or the council. Policy views can also be abstracted to an excessively high aggregation level. In this variant, the archived information is summarised at a very high level of abstraction, and this summary is made public. In the presentation of information, one can further strongly emphasise certain policy views, causing other statements to be underexposed. In this latter form, for example, certain text is displayed larger or certain views are given a different colour.

The fourth form of strategic resistance concerns opposition. Covert sabotage is the first form of opposition that is distinguished. For instance, it is agreed that personal policy views are communicated via WhatsApp in the form of emojis. The board member and the civil servant have agreed on a coding in advance that gives a specific meaning to an emoji. A certain smiley, for instance, could mean that the civil servant expects opposition in the municipal council. Should this communication traffic be made public, the reader will not understand much of it. The second form of opposition concerns withdrawal. In this case, for example, it is agreed with the board member that advice is given orally as much as possible and not in writing.

4. Research design

This study approached 70 municipalities where the municipal council decided in 2022 or 2023 to disclose personal policy views of civil servants in the interest of transparency. 62 municipalities agreed to participate in the research, varying in size and located across ten of the twelve different districts. With a total of 342 municipalities in the Netherlands, this provides a relatively reliable picture.

For each municipality, the decision to make personal policy views public was first analysed in detail, based on the typology of Table 1.

Subsequently, council members from all municipalities participating in this study were surveyed. Using a 10-point scale, they were asked whether the disclosure of personal policy views had led to a greater degree of transparency. Additionally, questions were posed regarding whether this information was provided in a timely manner and whether it was understandable. These questions referred both to the period before the decision to disclose was made and to the period after this decision. To accurately trace the effect of the decision to disclose personal policy views, only council members who had already been serving prior to 2022 or 2023 (depending on the year in which the disclosure decision was implemented) were invited to participate. In total, 316 council members completed the survey.

To identify potential resistance to the disclosure of personal policy views, the directors in each municipality were approached as respondents. A municipal director frequently interacts with board members, exchanging personal policy views. The directors could be working in the social domain, spatial domain, or even in business operations. To assess the degree of resistance and its potential causes, the directors were presented with statements in the form of a questionnaire, whereby they could indicate their level of agreement with the disclosure decision on a 5-point Likert scale (Reginato et al., 2016; Wirtz et al., 2016; Rho et al., 2021). In total, 167 directors completed the survey.

A problem arises regarding the possible forms of strategic resistance. One cannot assume that respondents will disclose potential forms of strategic resistance they employ themselves via a survey. This issue can be partially resolved by presenting hypothetical forms of resistance to the directors and having them evaluate these forms (Flory et al., 1992; Merchant & Rockness, 1994; Kaplan, 2001; Gelderman et al., 2006). However, the disadvantage of this method is that hypothetical statements cannot be directly translated into municipal reality. To address this problem, statements relating to forms of resistance employed by the director were not presented to the directors themselves, but to three colleagues working within the same directorate who have a good understanding of the director's practices (Flory et al., 1992; Merchant & Rockness, 1994; de Graaf & Strüwer, 2014). These three colleagues were selected and approached in consultation with the municipality's concern controller. Admittedly, this method still does not provide a completely reliable picture. After all, the response may be influenced by the nature of the relationship between the colleagues and the director (Singer & Singer, 1997; Kaplan, 2001). Since a Likert scale is used, the median of the responses from the three colleagues is employed.

To gain better insight into the underlying causes of potential resistance and the consequences this resistance may have on perceived transparency, an additional

Table 2
Causes and forms of resistance

Type of decision
A: Board proposals are made public upon request
B: Upon request, as much written communication as possible between a member of the board and a civil servant concerning a specific administrative matter is disclosed
C: Preparatory board proposals are attached as an appendix to the relevant council proposal
D: At a minimum, the decision memoranda prepared by a civil servant that pertain to a specific council proposal are attached as annexes to that council proposal
Perceived transparency
Overall impression
Accessibility
Timeliness
Extent of resistance
Degree to which policy officials experience resistance against the disclosure of personal policy views
Causes for individual administrative resistance to change
Fear of losing status quo: influence over the decision-making process
Lack of knowledge/inadequate communication about the intended change
Reduced trust in the management/administration that decided on the change
Fear that required competencies are not present
The intended change affects fundamental norms: fundamental objections
Change results in higher administrative burdens
Change does not provide a functional contribution
Fear of control
Forms of administrative strategic resistance
Bureaucratic behaviour
Delay: disclosing on the latest possible date
Strict adherence to procedures: repeatedly inquiring about background
Strict adherence to procedures: GDPR screening
Tactical behaviour (before information is archived)
Optimising only the factors that are observed: screening and editing information
Information manipulation (after information is archived)
Not providing information
Altering information
Providing an overload of information
Providing only abstract information
Emphasising certain information
Opposition
Covert sabotage: agreeing on and using information coding
Withdrawal: as much oral consultation as possible and minimal written communication

Source: Compiled by the author.

23 directors and 44 council members were interviewed. These participants were randomly selected from the group that had completed the questionnaire validly.

The various concepts related to the decision, perceived transparency, the extent of resistance, the causes of resistance, and the consequences of resistance can be summarised as indicated in Table 2.

5. Analysis of the results

The survey results concerning transparency are presented in Table 3 as follows.

Table 3
Transparency

	Type A: Board proposals are made public upon request		**Type B:** Upon request, as much written communication as possible between a member of the board and a civil servant concerning a specific administrative matter is disclosed		**Type C:** Preparatory board proposals are attached as an appendix to the relevant council proposal		**Type D:** At a minimum, the decision memoranda prepared by a civil servant that pertain to a specific council proposal are attached as annexes to that council proposal	
	Mean	*Wilcoxon*	*Mean*	*Wilcoxon*	*Mean*	*Wilcoxon*	*Mean*	*Wilcoxon*
Transparency general before the decision	3.1		5.1		4.0		4.8	
Transparency general after the decision	4.6	0.002	7.3	0.002	7.3	0.001	7.1	0.003
Accessibility before the decision	4.7		3.1		3.1		4.9	
Accessibility after the decision	5.7	0.010	3.8	0.031	6.5	0.001	2.3	0.001
Timeliness before the decision	5.1		3.6		5.7		5.0	
Timeliness after the decision	3.1	0.003	7.1	0.001	2.5	0.001	4.7	0.506

Source: Compiled by the author.

For each municipality, average scores were used as the basis for analysis. Table 3 shows that, for every type of decision, the general perception of transparency increased. However, when the decision was made to disclose board proposals either passively or actively, the perception of timeliness decreased. In cases where the decision was made to actively disclose more information than only board proposals, the perception of accessibility declined. No direct relationship was found between the decision to disclose information actively or passively and changes in perceived transparency. Actively disclosing information does not lead to significantly higher perceived transparency (Sig. = 0.193, Chi). Similarly, no relationship was found between the decision to disclose only board proposals or more information and changes in perceived transparency (Sig. = 0.089, Chi).

No correlation was observed between the degree of resistance and changes in perceived transparency as a result of the decision (Sig. = 0.262, Wilcoxon), nor was such a relationship found for any specific type of decision. Nevertheless, resistance to the

Table 4
Type of decision and the extent of resistance

Type of decision	**Median**				
	Overall	**Type A:** Board proposals are made public upon request	**Type B:** Upon request, as much written communication as possible between a member of the board and a civil servant concerning a specific administrative matter is disclosed	**Type C:** Preparatory board proposals are attached as an appendix to the relevant council proposal	**Type D:** At a minimum, the decision memoranda prepared by a civil servant that pertain to a specific council proposal are attached as annexes to that council proposal
Extent of resistance					
Degree to which policy officials experience resistance against the disclosure of personal policy views	2	1	**4**	2	**5**

Source: Compiled by the author.

decision to disclose personal policy views does exist, as shown in Table 4. An analysis of the results reveals a relationship between the decision type and the extent of resistance. Decisions to passively or actively disclose more information besides board proposals generate more resistance than decisions to passively or actively disclose only board documents (Sig. < 0.001, Chi).

The magnitude of resistance does not exhibit a clear relationship with its underlying cause. Resistance stemming from fundamental objections is not necessarily greater than resistance arising from a heightened perception of administrative burden or non-functionality. Apart from the relationship between perceived administrative burden and non-functionality, no correlation has been observed among the other causes of resistance. Notably, certain causes, such as lack of knowledge, distrust towards the council, or concerns about required competencies, are rarely cited as sources of resistance.

The decision type correlates with the cause of resistance. Passively disclosing as much written communication as possible creates a certain fear of losing influence over the administrative decision-making process. It also generates a feeling of being more strictly controlled. Notably, the decision to actively disclose more information than only board proposals leads to fundamental objections. The decision to passively or actively disclose only board documents reinforces the feeling that it increases administrative burden, while also increasing the perception of non-functionality as a result of this type of decision. This

Table 5
Relationships between decision type and causes of resistance

Passive disclosure of as much written communication as possible	Fear of losing influence	< 0.001
Passive disclosure of as much written communication as possible	Sense of being controlled	< 0.001
Active disclosure of more information than only board proposals	Fundamental objections	< 0.001
Passive or active disclosure of only board documents	Increase in perceived burden	< 0.001
Passive or active disclosure of only board documents	Increase in perceived non-functionality	< 0.001

Source: Compiled by the author.

Table 6
Relationships between causes and forms of resistance

Variables	**Spearman**	**Sig.**
Relationships between causes and forms of strategic resistance		
Fear of losing status quo versus screening and editing information before archiving	0.655	< 0.01
Fundamental objections versus using information coding	0.703	< 0.01
Fundamental objections versus using as much oral consultation as possible	0.837	< 0.01
Fundamental objections versus providing an overload of information	0.682	< 0.01
Fundamental objections versus providing only abstract information	0.689	< 0.01
Fundamental objections versus emphasising certain information	0.702	< 0.01
Administrative burdens versus delay	0.762	< 0.01
Non-functionality versus delay	0.784	< 0.01

Source: Compiled by the author.

can be represented as shown in Table 5, where, given the nominal scale of the decision type, a Chi-square is presented.

Table 6 illustrates the observed relationships between the causes of resistance and the forms of strategic resistance. To this end, only relationships with a Spearman correlation greater than 0.6 and a significance level less than 0.01 are presented.

Resistance originating from apprehension regarding loss of influence over the administrative decision-making process correlates more strongly with tactical behaviour aimed at perception optimisation. In such instances, the director engages in document redaction prior to archiving. Resistance stemming from fundamental objections to the decision to publicise personal policy views demonstrates a strong correlation with forms of opposition. This may manifest as pre-arranged coded communication with the mayor and aldermen or limitation of communication to verbal consultations. Fundamental objections also exhibit a stronger correlation with certain forms of information manipulation, such as information overload, abstraction, or selective accentuation. When resistance is rooted in perceived administrative burden or the perception of the decision as non-functional, it tends to correlate strongly with bureaucratic behaviour, characterised by attempts to delay information provision.

The question now arises whether there is a relationship between a specific form of resistance and perceived transparency. These relationships are indicated in Table 7.

Table 7
Relationship form of resistance and perception of transparency

Spearman	Transparency general	Accessibility	Timeliness
Delay: disclosing on the latest possible date	0.084	0.630**	–0.726**
Screening and editing information before archiving	–0.046	–0.170	0.628**
Providing an overload of information	–0.090	–0.682**	0.213
Providing only abstract information	–0.109	–0.595**	0.172
Using information coding	–0.154	-0.645**	0.215
Repeatedly inquiring about background	–0.488	–0.228	–0.023
GDPR screening	–0.300	–0.298	0.120
Emphasising certain information	0.044	–0.545	0.182
Withdrawal: as much oral consultation as possible and minimal written communication	–0.038	–0.524	0.196
Not providing information	0.031	–0.553	0.196
Altering information	0.075	–0.577	0.170

Source: Compiled by the author.

Table 7 shows that the form of resistance does not have a strong relationship with perceived general transparency. However, delaying the provision of information can negatively affect the perception of timeliness. Adjusting information before archiving, on the other hand, contributes positively to the perception of timeliness. Providing an overload of information or, conversely, abstracting information does not enhance the perception of accessibility. The same applies to the use of codifications.

However, perhaps the forms of resistance that are not related to the perception of general transparency, accessibility and timeliness are more interesting. After all, these forms of resistance remain unnoticed by council members. Repeatedly inquiring about the background, GDPR screening, emphasising certain information, the use of as much oral consultation as possible, not providing information and altering information after archiving may be mentioned as such instances.

For these unnoticed forms of resistance, it is possible to provide insight into their frequency of use for each decision type. To this end, Likert scores of 4 or higher were used as the criterion. The results are presented in Table 8. When the decision is made to

Table 8
Percentages of unnoticed strategies by decision type

	Type A: Board proposals are made public upon request	**Type B:** Upon request, as much written communication as possible between a member of the board and a civil servant concerning a specific administrative matter is disclosed	**Type C:** Preparatory board proposals are attached as an appendix to the relevant council proposal	**Type D:** At a minimum, the decision memoranda prepared by a civil servant that pertain to a specific council proposal are attached as annexes to that council proposal
Repeatedly inquiring about background	77%	0%	0%	0%
GDPR screening	77%	0%	0%	0%
Emphasising certain information	0%	0%	0%	100%
The use of as much oral consultation as possible	0%	0%	0%	100%
Not providing information after archiving	0%	0%	0%	46%
Altering information after archiving	0%	0%	0%	53%

Source: Compiled by the author.

passively disclose only board proposals, in 77% of the cases, repeated inquiries are made regarding the background of the request or a GDPR screening is conducted. Furthermore, the table shows that emphasising certain information and intensifying oral consultation are strategies applied in all cases where the decision was made to actively share more information than only board proposals.

6. Explanations based on the interviews

Council members are generally positive about the decision to disclose personal policy views. The perception that the board operates in a more transparent manner has generally increased as a result of this decision. However, respondents indicate that, in some cases, information is delivered late. This is particularly the case when the decision is made to disclose only board proposals. In addition, respondents sometimes experience

that the information becomes less accessible, especially when the decision is made to actively disclose more information than only board proposals.

Based on the interview results, a certain relationship can be inferred between the type of decision, the cause of resistance and the form of resistance. Fear of losing influence is exacerbated by decisions to passively disclose as much information as possible. This fear subsequently leads to tactical behaviour, where communication is edited and sometimes substantively modified before being archived. Administrators anticipate the possibility that communication may be requested and that they may lose their influence over the political-administrative decision-making process as a result. By editing written communication, this fear is partially alleviated. Favourable information is emphasised more strongly, while unfavourable information is sometimes deliberately removed from documents prior to archiving.

Decisions to disclose only board proposals do not elicit fundamental resistance or fear. However, according to the respondents, such decisions are perceived as non-functional and result in increased perceived administrative burden. This leads to bureaucratic behaviour in the form of delays.

Fundamental objections are linked to the perception that administrators can no longer perform their advisory role as a result of the decision. Respondents emphasise that the ability to freely advise council members is considered essential for their work. Fundamental objections arise from the perception that this ability is removed when all written communication is actively disclosed. Some respondents refer to the dual system, where the municipal council and the board of Mayor and Aldermen are regarded as two separate entities, with the council expected to oversee the board. While the council's office and municipal audit office can be seen as instruments for the council, the administrative organisation can be seen as an instrument for the board, according to respondents. Actively disclosing more information than board proposals (particularly toward the municipal council) is perceived as less compatible with this dual system.

Fundamental resistance leads to manipulation and opposition as forms of resistance. In cases of manipulation, information overload or highly abstract forms of information are frequently provided. It also occurs that certain information is emphasised by using different colours or fonts for specific information. The deliberate omission or alteration of information subsequent to its archival, while conveying the impression of completeness and originality, is reported with lower frequency due to respondents' apprehensions regarding the potential for future detection and disclosure of such practices. Opposition often involves agreeing on codes with board members. These codes are primarily used in WhatsApp communications but are sometimes applied in email correspondence as well. Additionally, this form of opposition frequently emphasises verbal communication while minimising written communication. Post-it notes, which are easily removable, are also used. According to respondents, this is related to the scope of the decision. Decisions to actively disclose decision-making memoranda are perceived as less threatening than decisions to also disclose personal communication between a civil servant and the board member.

The forms of resistance are neither cumulative nor hierarchical. For instance, engaging in opposition does not necessarily follow the application of other forms of resistance. This

observation aligns with the finding that forms of resistance are associated with the type of decision. Different decisions lead to different forms of resistance.

The degree of resistance is not directly related to perceived transparency. However, certain forms of resistance can influence the perceived accessibility and timeliness of the information provided. Logically, delaying information provision leads to a negative assessment of timeliness. Similarly, respondents confirmed that providing an overload of information, abstracting information, or coding information does not enhance perceived accessibility.

Some forms of resistance, however, cannot be detected by council members. Withholding information or altering views after archiving has no effect on perceived transparency, accessibility, or timeliness. The same holds for emphasising certain information. Agreements between aldermen and civil servants to communicate as much as possible orally are also not known to council members. The same holds true for repeatedly inquiring about the background and for GDPR screening. Respondents generally indicate that they are not aware of these practices, although some suspect they do occur.

7. Conclusion

Municipalities are increasingly disclosing civil servants' personal policy views with the aim of improving the provision of information to municipal councils and other stakeholders. This study focuses on the question of whether the disclosure of personal policy views of municipal civil servants leads to increased perceived transparency among council members, whether there may be resistance to the decision to disclose, and whether such resistance could result in apparent transparency.

The findings indicate that the decision to make civil servants' personal policy views public enhances council members' perception of transparency. However, when the decision is made to disclose only board proposals, council members report experiencing delays in the delivery of information. Similarly, when more information than only board proposals is actively disclosed, council members perceive the information as less accessible.

Nevertheless, these findings do not provide the full picture. It remains possible that perceived transparency increases following the decision to disclose policy views, while actual transparency does not necessarily improve. This discrepancy may be related to potential administrative resistance to the disclosure decision and the various forms such resistance may take.

The study demonstrates a relationship between the type of decision and the magnitude of resistance. Decisions to passively or actively disclose more information than only board proposals between civil servants and the board elicit more resistance than decisions to passively or actively disclose only board documents.

Different types of decisions of disclosure lead to various causes of resistance. Passive disclosure of as much information as possible generates resistance caused by fear of losing influence over the administrative decision-making process and feeling more controlled. The decision to disclose only board documents (passively or actively) intensifies the perception

of increased administrative burden and non-functionality. The decision to actively disclose more information than only board proposals can lead to fundamental objections.

Different causes of resistance can lead to various forms of resistance. Resistance stemming from fear of losing influence over the administrative decision-making process leads to a relatively stronger tactical behaviour aimed at optimising perception: communication is edited before archiving. If the cause of resistance lies in perceived administrative burden or if the decision is deemed non-functional, this can lead to a relatively stronger bureaucratic behaviour, where attempts are made to delay information provision. Resistance arising from fundamental objections to disclosing personal policy views leads to relatively stronger forms of information manipulation and opposition.

Forms of resistance do not affect perceived general transparency. However, delaying the provision of information negatively impacts the perception of timeliness. Providing an overload of information, abstracting information and coding information reduce perceived accessibility. Nevertheless, some forms of resistance go undetected. For example, withholding information, altering views after archiving, or emphasising certain information are generally not noticed by council members. The same applies to the intensification of oral consultations and the reduction of written communication, repeatedly inquiring and GDPR screening. This suggests that these latter forms of resistance may result in only an apparent transparency. Although council members perceive an increase in transparency following the decision to disclose, this may not necessarily reflect actual transparency.

The research findings support the expectation that the decision to disclose civil servants' policy views leads to forms of resistance, and that some of these forms of resistance remain unnoticed and result in apparent transparency. The use of these unnoticed forms of resistance is strongly associated with the type of decision that is made. For example, in all cases where the decision was taken to actively disclose more information than only board proposals, certain information is emphasised and oral consultation is intensified. The decision to passively disclose only board proposals results in repeated inquiries about the background of the request and the implementation of a GDPR screening in most cases.

8. Discussion

The causes of resistance identified in this study partially correspond with previous research. Resistance may arise from fear of losing influence over the administrative decision-making process (cf. Kotter & Schlesinger, 1979; Reginato et al., 2016; Jenhaug, 2020). It can also be caused by an increased perception of administrative burden or non-functionality (Bozeman, 1993; DeHart-Davis & Pandey, 2005). Additionally, resistance may stem from fear of being controlled (Ouchi, 1979; Briers & Hirst, 1990). Fundamental objections to the intended change can also cause resistance (Howlett et al., 2020). Not every cause of resistance identified in previous research was found in this study. Inadequate communication or distrust towards the council were less frequently cited as causes by respondents. Respondents were also less concerned about lacking necessary

competencies. This may be related to the type of decision at the centre of this study, and it is conceivable that other types of decisions would reveal different underlying factors.

The forms of resistance found in this study also align with previous research. Deliberate delay occurs relatively frequently (Hood & Peters, 2004). Information is edited, emphasising positive elements while less positive communication is not archived (Aardema, 2005; Hood, 2007; Bouckaert & Halligan, 2008). Information is also manipulated before release (Hopwood, 1972; Hopwood, 1973; Hood, 2006a). Forms of opposition where individuals withdraw from the decision have also been observed (Groot & van Helden, 2003; Hood, 2007). These forms of resistance can be traced back to the mode of information provision promoted by the decision. Decisions to disclose information often involve a one-way information flow, which provides a basis for strategic resistance. In this context, actual transparency might be better served by genuine two-way communication (Hood, 2007).

This study has certain limitations. The present study has focused exclusively on a single type of decision: the disclosure of personal policy views of civil servants. Furthermore, only municipalities were included in the research scope. The municipalities were selected based on their decision to disclose personal policy views in 2022 or 2023, resulting in relatively limited experience with such disclosure. It is plausible that perceived transparency or resistance may decrease or increase over time. Additionally, different forms of resistance may emerge over time, potentially leading to a cumulative nature of resistance strategies. Moreover, numerous factors that could influence the relationship between resistance and transparency have been excluded from consideration, such as the mode of internal communication regarding the decision and the organisational culture within the municipality. The forms of resistance were identified based on responses from three colleagues of the respective director. This raises questions about the reliability of this basis for inferring forms of resistance and whether other forms of resistance might be employed beyond the purview of these colleagues. Besides, it is never possible to obtain an entirely objective picture of actual transparency. This is particularly true when various forms of resistance are observed, raising the question of whether the disclosed information is truly complete. These limitations provide a foundation for future research. Such research could consider additional factors and potentially involve other types of changes and organisations.

The former regulation, prior to the Woo, provided an exemption ground for personal policy views, which was frequently utilised. The Woo aims to increase the disclosure of personal policy views. The explanatory memorandum accompanying the Woo states that a cultural change is necessary regarding transparency and information management. While cultural change cannot be legislated, the law can provide instruments to facilitate such a change. The question arises as to what extent the Woo adequately accounts for causes and forms of administrative resistance. Additionally, one may inquire whether a decision to disclose as much communication between civil servants and board members as possible strikes the right balance between information disclosure and the importance of freely communicating opinions to board members.

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Fraud in Public Procurement

Governance, Internal Supervision and Political-Economic Challenges in the Indonesian Context

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Abstract: This study aims to analyse the factors that influence fraud in government procurement in the context of the central government in Indonesia. By using a mixed method, this research uses a sequential explanatory design involving two stages: a quantitative research using 128 respondents' data on the one hand, and qualitative research with 9 informants and 132 respondents on the other hand, supported by the use of agency theory and rent-seeking theory enriched with normative studies as an approach to explain types of procurement fraud in Indonesia. Through multiple linear regression on the data of 128 respondents processed using the SPSS application, this study demonstrates that procurement governance is negatively related to procurement fraud, just as the role of effective APIP is negatively related to procurement fraud. In contrast, economic-political pressure is positively related to procurement fraud. Meanwhile, the impact of research findings on procurement regulators' issuance of related policies underscores first the relationship between law enforcement and APIP. Second, the handling of procurement objections that ensure the confidentiality of whistleblowers through APIP. Third,

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a procurement clearing house to handle strategic procurement packages involving three areas of expertise: procurement, law and supervision. And fourth, procurement digitisation leading to open data platforms and the use of artificial intelligence in fraud detection.

Keywords: procurement governance, the role of effective APIP, economic-political pressure, procurement fraud

1. Introduction

Globally, public procurement fraud refers to any fraudulent act occurring throughout the government procurement cycle: from needs identification and planning to supplier selection, contract execution, and final handover. Such fraud may be perpetrated by internal procurement actors, such as Procurement Officers (PP), Procurement Selection Working Groups, Engagement Officers (PPK), Head of the Procurement Unit (UKPBJ), Authorised Budget Users (KPA) and Budget Users (PA), either individually or through intra-organisational collusion, as well as through collusion with external actors (Gottschalk, 2017; Rustiarini et al., 2019). In addition, external suppliers may also engage in procurement fraud by manipulating or undermining the procurement system through horizontal conspiracies among business actors (ACFE, 2020; Hudon & Garzón, 2016).

Opportunistic behaviour among internal and/or external procurement actors can arise due to several factors, including: 1. the existence of considerable authority supported by the power of information possessed by internal procurement agents but not accompanied by adequate transparency and accountability obligations; 2. the existence of discretionary space to regulate schedules, packages, selection mechanisms, selection of qualification criteria and procurement evaluation methods that can be adjusted to their economic interests (ADB/OECD, 2008); 3. the existence of a motive to seek maximum profits through conspiracies both inside and outside the procurement system; 4. a system of supervision, monitoring and sanctions that is less effective and does not provide a deterrent effect; 5. executive institutions, especially public procurement activities that are never free from pressure and intervention of the political elite (Knight et al., 2007).

Indeed, nearly every year, government oversight bodies such as the Supreme Audit Agency (BPK) and the Corruption Eradication Commission (KPK), along with civil society organisations like Indonesia Corruption Watch (ICW), report recurring cases of procurement fraud that result in significant state losses.

According to the 2020 Audit Report of the Supreme Audit Agency of the Republic of Indonesia (BPK RI), procurement violations included IDR 12.11 billion in work-volume discrepancies, IDR 15.49 billion in unpenalised delays and IDR 1.20 billion in fictitious expenditures. KPK data from 2004–2025 (as of 16 October 2025) further show that procurement corruption is the second most frequent offence after bribery (1,068 cases), with 428 procurement cases involving actors from the executive, legislative, law enforcement and private sectors. ICW's *Corruption Enforcement Trend Monitoring Report* for 2024 also records price markups as the third most common corruption scheme

(33 cases), but the second most damaging financially, generating losses of IDR 3.19 trillion, second only to fictitious reporting in the mining sector (IDR 272.08 trillion). Collectively, these data demonstrate that procurement fraud consistently ranks among the top three forms of corruption in Indonesia, both in frequency and financial impact.

Improvements in procurement governance are expected to prevent and reduce public procurement fraud (Silalahi et al., 2023). Strengthening the role of internal audit institutions (APIP), particularly through the adoption of advanced technologies such as big data analytics and robotic process automation, has enhanced fraud detection capabilities and operational efficiency in procurement processes (Yanuarisa et al., 2025). However, a critical question remains regarding whether reforms in procurement systems and internal supervision mechanisms are sufficient to prevent political interference in procurement decision-making.

Ware et al. (2011) underscore the persistent challenges faced by developing countries, including non-transparent planning processes, inadequate needs assessments, inconsistent cost estimations, limited oversight capacity and pervasive political interference. In Indonesia, the high costs of political campaigns have prompted certain actors to seek external funding through corporate donations, which, within a culture of reciprocity, are seldom provided without expectation of return. These dynamics foster mutual dependence among political parties seeking financial resources and political legitimacy, bureaucrats striving to expand budget allocations, and corporations pursuing economic gains through privileged access to government procurement projects. Even in advanced economies, procurement practices continue to be shaped by interdependent and mutually reinforcing relationships among bureaucrats, business actors and elected officials (Johnston, 2005; Rose-Ackerman & Palifka, 2016).

Therefore, the primary objective of this study is to develop a foundational theoretical framework and empirical research model to address the existing research gap concerning the relationship between procurement governance, internal supervision, economic-political pressures and the incidence of procurement fraud within Indonesia's central government. The conceptual and empirical propositions derived from this objective are elaborated as follows.

First, the paper examines the effect of procurement governance on reducing government procurement fraud. Then, it analyses the role of internal audit effectiveness (APIP) in mitigating government procurement fraud. Third, we investigate the influence of economic-political pressures on the incidence of government procurement fraud. And finally, the research identifies weaknesses in procurement governance and in APIP's effectiveness in controlling potential procurement fraud, and recommends corrective measures to address these issues.

This study offers a novel contribution by integrating procurement governance, APIP effectiveness and economic-political pressures into a unified analytical framework to explain government procurement fraud. While existing studies primarily examine governance and oversight in isolation, this research highlights how oversight capacity and economic-political structures interact to shape fraud risks in public procurement. Additionally, the study empirically identifies vulnerabilities within procurement reform

and internal audit practices in Indonesia's central government, offering context-specific insights rarely documented in prior literature.

2. Conceptual analysis

2.1. Fraud in government procurement

From a principal–agent and institutional perspective, government procurement is very vulnerable and can occur in all stages of the procurement process, from preparation to handover of goods/services. This is because: 1. procurement activities involve very large government funds; 2. there is quite intense interaction between the public and private sectors in its implementation; 3. there is a discretionary space for public officials in unsupervised procurement (ADB/OECD, 2008); 4. conflict of interest and information asymmetry between suppliers and procurement officials and/or unit/work unit officials who need goods and services (Williams-Elegbe, 2012); 5. the low income of the civil servant officials will encourage their involvement in fraudulent practices. In addition, 6. the ease of setting up the procurement system, including packaging and tender requirements, arranging the selection of procurement schedules and tender announcements, and arranging the selection of assessment methods and evaluation criteria for winners.

As illustrated in Figure 1, procurement fraud may be perpetrated by either internal or external procurement agents. Such misconduct can lead to ethical, administrative and competition law violations, potentially causing state financial losses. Legal responses may involve non-litigation mechanisms, such as compensation claims by the State Loss Settlement Team or proceedings before the Business Competition Supervisory Commission (KPPU) for monopolistic or collusive practices, or litigation channels through corruption charges related to government procurement.

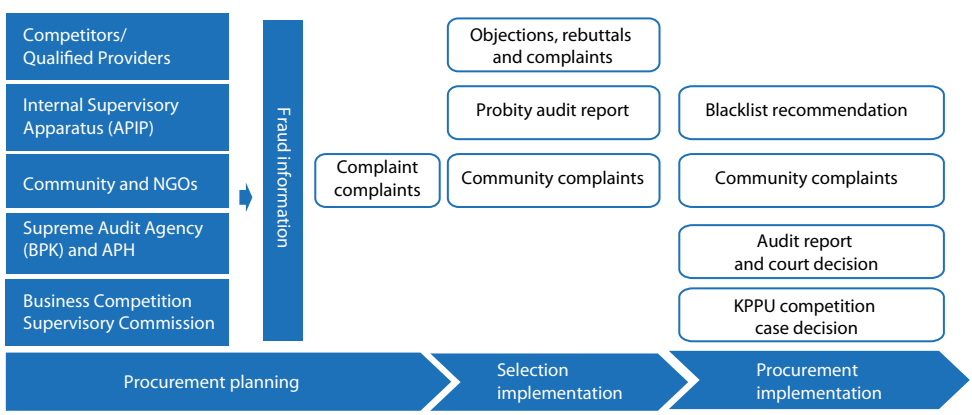

Figure 1
Information of fraud procurement

Source: Compiled by the authors.

2.2. Agency theory in government procurement

The essence of the agency problem is due to the asymmetry of information between the Principal and the Agent, where the agent always has more information than the principal because of their knowledge, proximity, expertise and work experience. An effective control mechanism is needed to control the agent's behaviour to align with the principal's goals (Gomez-Mejia & Wiseman, 2007). Especially in the public sector, which does not recognise the term incentive to control agent behaviour, an effective monitoring system is needed to control the opportunism of procurement agents and providers. The agency relationship in government procurement becomes complicated, complex and far from simple because it involves many related issues: 1. the contract itself is "absurd" in the form of delegation of authority which has an impact on the principal's limited ability to punish the agent if it violates its mandate; 2. information asymmetry between internal procurement agents which is very bureaucratic; 3. organisational goals and procurement activity goals which are not only oriented towards value for money but also to maximise social welfare and public interest as well as national development; and 4. a monitoring mechanism in public sector carried out by BPK RI, APIP, Law Enforcement Officers (APH), and public officials for aligning agents which is very different from the private sector which tends to use incentive mechanisms, meanwhile, in the public sector, it is best to use digital surveillance, which has proven to have many benefits (Shi & Zhang, 2025).

As shown in Figure 2, conflicts of interest in government procurement manifest across four institutional levels: between PA/KPA and procurement officers, between the legislature and budget users, between citizens and their representatives, and between the government and business actors. At each level, agents possess discretionary authority that enables deviation, procurement officials in provider selection, budget users in program execution, legislators in budget allocation, and suppliers in contract fulfilment. These multi-layered principal–agent distortions illustrate how individual actors exploit

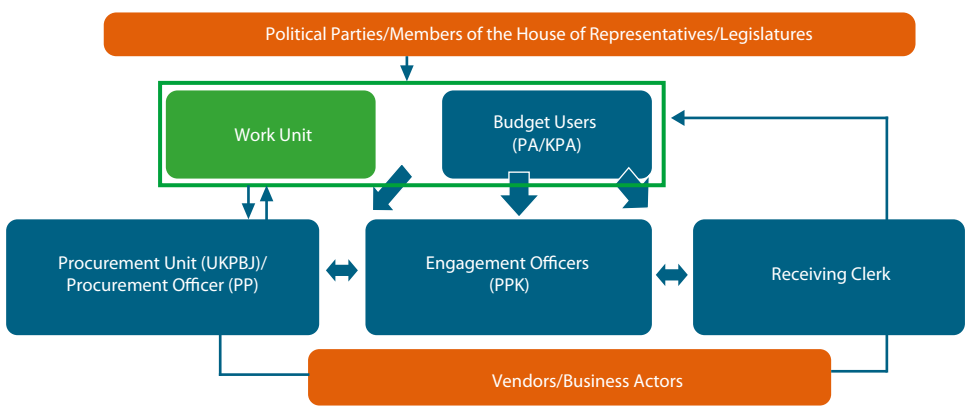

Figure 2
Conflict of interest in the procurement process
Source: Compiled by the authors.

asymmetric information and weak accountability structures to pursue private utility, thereby perpetuating systemic procurement fraud.

2.3. Rent-seeking in government procurement

The collusive relationships between business actors as providers of government goods and services and those in political or bureaucratic power illustrate what political economy scholars term *rent-seeking behaviour*. As Grindle (1989) explains, bureaucrats, politicians and societal elites often function as rent-seeking coalitions driven by short-term economic and political gains rather than by the pursuit of collective welfare or national prosperity. In this context, procurement networks become arenas for redistributive competition over public resources, where institutional capture and patronage replace efficiency and fairness as the dominant logics of governance.

In Indonesia, the nexus between economic and political power is most visible during democratic contests such as presidential, legislative and regional elections. Running for public office in Indonesia entails exceptionally high costs, no less than 500 billion IDR for presidential and vice-presidential candidates, 5–15 billion for legislative candidates, around 30 billion for regents or mayors, and about 100 billion for governors. These financial pressures drive candidates to seek external funding, while business groups provide support in exchange for potential returns, particularly through access to lucrative government procurement projects. The structural dependence of political parties on financial capital fosters alliances between political and business elites to secure electoral victories. Consequently, public budgets and procurement spending are often directed toward projects that are prone to corruption (Keefer & Khemani, 2003).

From a political-economic perspective, the enduring symbiosis between political elites, bureaucrats and business actors in Indonesia reflects a persistent form of rent-seeking and state capture. This elite network operates within an institutional environment shaped by: 1. a pragmatic and interest-driven political culture centred on personal and factional gains; 2. coalition-building motivated by *office-seeking* and short-term power maximisation; 3. legal and policy frameworks that function as political instruments to preserve elite control; 4. a hierarchical and rent-generating bureaucracy that serves as a strategic site for resource extraction; and 5. political parties and legislatures acting as *political brokers* who commodify authority and policy access for elite benefit (Azhar, 2012).

3. Hypothesis development

Research on the effectiveness of procurement governance has evolved over the years, lastly its ability to reduce opportunities for collusion and procurement corruption. The change in governance of procurement systems from paper-based to electronic-based is believed by both developed and developing countries to be effective in combating procurement corruption, such as in Portugal (Ferreira et al., 2014), Albania (Kashta, 2014), Turkey (Soyaltin, 2017), Malaysia (Azmi & Rahman, 2015), Kenya (Mutangili, 2019),

Nigeria (Adebayo, 2016; Ebong, 2020), Nepal (Neupane et al., 2012). This is due to the ability of an electronic-based procurement system to change the procurement business process to be more transparent, more accountable, easier to track if there is fraud, and easier to monitor by various stakeholders. Currently, the Indonesian Government is aggressively promoting procurement mechanisms through e-purchasing, which is believed to directly reduce the level of fraud in procurement and expand market access (Zahra et al., 2022). The latest research on digital transparency tools, particularly open data platforms, electronic procurement systems and artificial intelligence-based fraud detections shows a significant decline in corruption rates (Kotukov et al., 2025). For this reason, we formulate the following hypothesis.

H1. Procurement governance has a negative effect on government procurement fraud

Research related to the influence of APIP effectiveness on procurement fraud has not been found to the best of our knowledge. APIP effectiveness can increase the effectiveness of the internal control system through testing the procurement control system (Søreide, 2002), strengthen the enforcement of procurement governance (Meagher, 2006), and enhance governance in public procurement by fostering transparency, accountability and efficiency (Yanuarisa et al., 2025). Research that discusses APIP institutionally, both its independence and size, can be seen from the research of Asiedu and Deffor (2017), which analysed the relationship between corruption and effective internal audit functions in Ghana, showing that the size of the internal audit department significantly affects the effectiveness of the internal audit function, which has a negative impact on corruption. For this reason, we formulate the following hypothesis.

H2. The effectiveness of APIP has a negative effect on government procurement fraud

In addition to developing anti-procurement fraud programs, the government faces the threat of external factors, factors that cannot be controlled, such as the intervention of political forces (Nugroho, 2014), and also the strength of supplier associations in paralysing the procurement system. Moreover, the huge political costs in Indonesia, both as candidates for regional heads and as candidates for legislative members, are the main motive for returning election capital (Hasibuan et al., 2019). Therefore, the symbiosis of mutualism between political elites who need funds for political expenses and businessmen who are thirsty for rent-seeking is impossible to avoid. The procurement system has instead become an arena of favouritism and unfairness to build connections with the political elite and to improve the electoral performance of the ruling party (Gürakar, 2016), and this condition is very difficult to measure (Dávid-Barrett & Fazekas, 2020). The problem of procurement fraud arises when there is political pressure from certain parties (Goel & Nelson, 1998; Hessami, 2014) or from individual rationalisation (economic pressure) supported by the opportunity and ability to justify and regulate the procurement market (Pavel & Rističová, 2015). For this reason, we came to the final hypothesis.

H3. Economic-political pressure has a positive effect on government procurement fraud

4. Research methods

This research is based on a mixed-method analysis to investigate all aspects related to government procurement fraud. Given that the characteristics of fraud are very complex, diverse and difficult to uncover, in addition to using quantitative methods, we will also explore fraud more deeply with a case study approach on two ministries and agencies.

The quantitative research method uses primary data, the results of respondents' perceptions obtained from the results of filling out questionnaires cover three groups, namely 1. internal procurement actors (PA/KPA, PPK, Head/Staff of UKPBJ, Procurement Officers); 2. external procurement actors (procurement participants/ suppliers); and 3. internal supervisors (APIP) on a Likert scale that will be used to answer associative research questions through a series of tests on the hypotheses with a view to testing the relationship between procurement governance, APIP effectiveness and economic-political pressure on public procurement fraud.

The questionnaire was designed after having reviewed various procurement regulations and research journals, and its design consisted of 40 questions divided into two main units. First, there are 25 questions on three independent variables, such as procurement governance (13 items), APIP effectiveness (7 items) and political-economic pressure (5 items). And second, there are 15 question items on one dependent variable: government procurement fraud. And it was reviewed by procurement experts/practitioners and senior procurement supervisors to confirm the truth of the question items as well as to obtain input/suggestions for improvement. A pilot test was conducted, following the receipt of ethical clearance and research permission, involving 15 respondents from procurement agencies via Google Forms to examine the validity and reliability of the research instrument.

Table 1
Research variables

Variable	Indicator	Scale
Procurement governance (TKP)	Procurement transparency (TRN), procurement accountability (AKT), utilisation of e-procurement (EPROC), independence of procurement units (IUP), professionalism of procurement officials (PPP), maturity level of procurement units (TMP)	Likert (1–5) level of conformity
APIP effectiveness (EAP)	APIP independence (IND), APIP size (UP), APIP capabilities (KAP)	Likert (1–5) level of conformity
Economic- political pressure (TEP)	Political pressure (TPO), economic pressure (TEK), provider concentration (KOP)	Likert (1–5) level of conformity
Government procurement fraud (FPP)	Criteria for fraud in state losses (Article 1, point 15 of Law No. 15 of 2006) Violations of procurement ethics (Article 7 of Presidential Regulation No. 16 of 2018) Procurement blacklist (Regulation of the Head of the National Procurement Agency No. 17 of 2018) Unfair competition (Article 23 of Law No. 5 of 1999)	Likert (1–5) the frequency of the occurrence

Source: Compiled by the authors.

The data was analysed using a statistical application, SPSS v.25. The tests carried out include the Classical Assumption Test to ensure that the estimation method has the property of BLUE (Best Linear Unbiased Estimator), as there are several classical assumptions that should not be violated, including: a) Multicollinearity; b) Heteroscedasticity; c) Autocorrelation. The regression equation is as follows:

$$FPP^{k} = \alpha + \beta_1 TKP_1 + \beta_2 EAP_2 + \beta_3 TEP_3 + \varepsilon$$

Qualitative methods are used for the purpose of proving, expanding and deepening the results of quantitative research obtained at the initial stage and need to be carried out for further research. This stage is carried out to investigate, describe, explain and find qualities or privileges of social influence that cannot be explained, measured or described through a quantitative approach. Relevant to the research topic, where procurement system reform and internal control system reform have been carried out, but there are still various cases of procurement fraud.

We have also made our best efforts to improve the trustworthiness of the analysis by way of selecting credible sources based on expertise and repeated, in-depth observation of extensive datasets across various national procurement systems (e-proc, SiRUP, Inaproc and SiUKPBJ). Also, we have enhanced transferability by providing detailed descriptions of each step in the qualitative research process; ensured dependability through a systematic audit of the study, including review and cross-checking with respondents to confirm that interpretations aligned with the contextual realities. And we have strengthened confirmability by ensuring that all findings could be traced back to field notes, survey data, documentary evidence from multiple sources, and transcripts of informant interviews.

Data collection was designated to answer the research questions and, in accordance with the research objectives, namely procurement fraud patterns according to the perspective of government supervisors, internal procurement actors and external procurement actors. The data collection techniques employed are as follows:

1. in-depth interviews/Focus Group Discussions: a) APIP; b) internal procurement actors (PPK/Chairman of UKPBJ/PP)
2. survey of internal procurement actors, external procurement actors and procurement supervisors
3. document analysis, comprising a) General Election Commission Report; b) LKPP report and BPKP report

5. Results and discussion

5.1. Quantitative results

5.1.1. Piloting test results

The questionnaire was first evaluated by eight experts, including practitioners and senior procurement supervisors from LKPP, provider companies and two ministries/institutions

involved in the study. After obtaining ethical clearance and research authorisation from the BRIN Ethics Commission for Social Humanities (Ethical Clearance Letter No. 007/KE.01/SK/01/2023, valid from January to December 2023), a small-scale distribution was conducted. The pilot test applied purposive sampling, targeting respondents with at least one year of experience as internal or external procurement actors or APIP members. Of the 19 individuals approached, 15 met the criteria and were included. Validity testing using SPSS 25, with 15 respondents (DF = 13) and a 5% significance level (two-tailed, r-table = 0.5140), produced the results summarised in Table 2.

Table 2
Piloting validity results

No.	Statement in variables	Validity	
		Yes	No
1	Procurement governance	10	3
2	APIP effectiveness	6	1
3	Economic-political pressure	4	1
4	Government procurement fraud	14	1

Source: Compiled by the authors.

Then the reliability test was carried out, all Cronbach's Alpha values were above 0.800, so it can be concluded that the measuring instrument in the study is considered reliable (feasible). Thus, based on the validity test, there were 6 invalid statement items which is then paraphrased via Quilbot.

5.1.2. Descriptive statistics

The number of samples obtained from the two central government ministries/institutions is 128 selected samples out of 134 respondents, because 6 samples could not be used for the following reasons: 1. two respondents were not willing to cooperate; 2. three respondents did not meet the minimum requirement of one year experience in the procurement process; and 3. one sample was not filled out correctly.

Table 3
Respondents based on their role in procurement

Element	Position	Frequency	Percent
Internal procurement actors	PPK, Head/Staff of UKPBJ, Procurement Officers, KPA	56	43.8
External procurement actors	Procurement Participants/Suppliers	10	7.8
Internal supervisors	APIP	62	48.4

Source: Compiled by the authors.

Characteristics of variables as shown in Table 4.

Table 4
Descriptive statistics

Variable	Minimum	Maximum	Mean
Procurement governance	31.00	65.00	50.4219
APIP effectiveness	10.00	35.00	25.8594
Economic-political pressure	5.00	25.00	15.0938
Government procurement Fraud	16.00	53.00	30.3984

Source: Compiled by the authors.

Respondents reported relatively high perceptions of procurement governance (M = 50.42 > 39.00), APIP effectiveness (M = 25.85 > 21.00) and economic-political pressure (M = 15.09 > 15.00). Conversely, the perception of government procurement fraud was lower (M = 30.40 < 35.00), indicating that most respondents viewed procurement fraud in their institutions as relatively low.

5.1.3. Statistical test results

The First Regression Equation Model was proposed to answer three research questions. Multiple linear regression analysis was used to analyse the relationship between the influence of independent variables of procurement governance (X1), APIP effectiveness (X2) and economic-political pressure (X3), partially on the dependent variable, namely government procurement fraud (Y).

Table 5 shows the following: There is a negative influence of procurement governance (TKP), APIP effectiveness (EAP) on government procurement fraud (FPP): –0.239 at a significant value of 0.003 < 0.05 (a significance level of 1%), –0.534 at a significant value of 0.000 < 0.05 (a significance level of 1%). This means that individually, the procurement governance variable (X1), APIP effectiveness variable (X2) has a significant effect on the government procurement fraud variable (Y). These results show that the data used in this study supports H1 and H2, which state that procurement governance and APIP effectiveness has a negative effect on government procurement fraud. In other words, improving procurement governance and APIP capability can reduce government procurement fraud.

These findings are in line with previous studies in various countries that examine the relationship between procurement governance and procurement fraud, including: Portugal (Ferreira et al., 2014), Albania (Kashta, 2014), Turkey (Soyaltin, 2017), Malaysia (Azmi & Rahman, 2015), Kenya (Mutangili, 2019), Nigeria (Adebayo, 2016; Ebong, 2020) and Nepal (Neupane et al., 2012). In Indonesia itself, since the government ratified the UNCAC in 2006 and combined bureaucratic reform, procurement reform accelerated with the national corruption prevention strategy and measured in the corruption

Table 5
Statistical test

Test	Linier Model ($FPPK^k = \alpha + \beta_1 TKP_1 + \beta_2 EAP_2 + \beta TEP_3 + \varepsilon$)	
	Value	**Result**
Classical assumption (the classical assumption test is a statistical requirement that must be met in multiple linear regression analysis)	Normality (Kolmogorov Smirnov 0.200 > 0.05) Multicollinearity (VIF < 10) Heteroscedasticity (Spearman's Rho > 0.05) Autocorrelation [Durbin Watson = 1.998 (du = 1.7596 dan 4- du = 2.2404)]	Normal distribution No Multicollinearity No Heteroscedasticity occurs There is no tendency of Autocorrelation
Regression formula (a study of the relationships between variables)	$Y = \alpha - \beta_1 TKP_1 - \beta_2 EAP_2 + \beta_3 TEP_3 + \mu$	$Y = 41.331 - 0.239X1 - 0.534X2 + 0.986X3 + \mu$
T-test	Significant scores accepted are below 0.05. The sig score of TKP (0.003 < 0.05), EAP (0.000 < 0.05), TEP (0.000) < 0.05); all variables at a significance level of 1%	There is an influence of the independent variables of procurement governance (X1), APIP effectiveness (X2) and economic-political pressure (X3), partially on the dependent variable, government procurement fraud (Y)
F-test	The calculated F-value is greater than the F-table value (75.347 > 2.68), and the significance value of 0.000 is smaller than the significance level of 0.05	All independent variables [procurement governance (X1), APIP effectiveness (X2) and economic-political pressures (X3)] simultaneously influence government procurement fraud (Y)
Coefficient determination	The R-Squared is 0.646 or 64.6 %	This means that the procurement governance variable (X1), APIP effectiveness variable (X2) and economic-political pressure variable (X3) have an influence of 64.6% on government procurement fraud, while the remaining 35.4% is influenced by other variables that are not examined in this study

Source: Compiled by the authors.

prevention action plan, procurement governance has developed not only as a means of transparency and accountability, but it has also been used to reduce the risk and occurrence of government procurement fraud.

This finding is further supported by documentary evidence indicating that the Procurement Governance Index in both agencies was assessed as *Good*. The detailed procurement governance profile is presented below.

Table 6
Procurement governance profiling

Components	Value (score)		Weight (%)
	Institution 1	Institution 2	
SIRUP	10.00	10.00	10
e-tendering	5.00	5.00	5
e-purchasing	3.92	0.00	4
Online store	1.00	1.00	1
Non e-tendering / Non e-purchasing	0.00	0.00	5
e-contract	4.76	3.85	5
Human resource qualifications and competencies in procurement	25.26	19.71	30
UKPBJ maturity level	40.00	40.00	40
Total	89.94 (Good)	79.56 (Good)	100

Source: Final ITKP 2024, https://siukpbj.lkpp.go.id

By improving procurement governance, the objectives of preventing procurement fraud are four. First, to reduce the space for discretion, rationalisation, personal interests and moral hazard in internal procurement actors (KPA, PPK, PP). Second, to reduce information asymmetry between internal procurement actors PA/KPA vs. UKPBJ, PPK, PP. Third, to increase the professionalism of human resources procurement, which in some cases can detect and prevent fraud committed by external procurement actors, such as detecting false documents/information and detecting collusion of providers who arrange price offers. And fourth, to open up channels for objections/complaints which can be directly monitored by LKPP and directly followed up by APIP or law enforcement.

Although there has been no research investigating the direct relationship between APIP effectiveness and government procurement fraud, various international studies, such as those from Church et al. (2001), Rezaee (2005), Nicolaescu (2013), have succeeded in confirming with confidence that internal auditors are the "first line of defence" against fraud, by enhancing governance in public procurement (Yanuarisa et al., 2025). Likewise, national research, such as Taufik (2011) or Pratomo (2016) with an internal audit locus in Riau provinces, districts/cities, (Prakoso & Zulfikar, 2018) with the audit inspectorate locus of BPKP Yogyakarta and Lorensa et al. (2018) concluded that the role of internal auditors affects fraud prevention. One of the added values of this research is to prove the influence of the determination of APIP effectiveness on government procurement fraud, which confirms that an effective APIP can reduce government procurement fraud.

These findings are also supported by documentary evidence showing that both agencies have achieved their APIP effectiveness targets. The detailed APIP effectiveness profile is presented below.

Table 7
Profiling the role of APIP effectiveness

Components	Value (score)		National target
	Institution 1	Institution 2	
Risk Management Index	3.33	3.42	3
APIP capability	3.00	3.94	3
SPIP maturity	3.29	3.44	3
Corruption Control Effectiveness Index	3.00	3.01	3

Source: Minutes of the Results of the Self-Assessment Evaluation of the Maturity of SPIP Implementation in 2024 No.PE.09.03/SP-55/D2/05/2024.

The effect of APIP's effectiveness can be explained from APIP's service activities on UKPBJ which always provide early warnings, especially through the insurance activities starting from need identification to post-procurement through Plan for State-Owned Goods Requirements (RK-BMN) review activities, probity audits, procurement monitoring, procurement audits and investigative audits on community complaints indicated by corruption, collusion and nepotism. It also implies consulting, as APIP can also increase the effectiveness of UKPBJ risk management, including managing entity risks, accelerate the development of internal control (anti-corruption activities) and provide input that can maintain and improve the quality of procurement governance. Thus, APIP, as the eyes and ears of the leadership (PA/KPA), can control the opportunistic behaviour of procurement management (PPK, UKPBJ, Procurement Working Group, Procurement Officials) and the opportunistic behaviour of external procurement actors (procurement participants/suppliers) in maximising profits for themselves will eventually decrease.

There was a positive effect of economic-political pressure (TKP) on government procurement fraud (FPP) of 0.986 at a significant level of 1%. The results of the SPSS calculation obtained a t-value of 9.103 > t table 1.97928 with a significant value of 0.000 < 0.05. This means that individually, the variable of political-economic pressure (X3) has a significant effect on the variable of government procurement fraud (Y). These results show that the data used in this study support H3, that is, increasing political-economic pressure can increase government procurement fraud.

Although previous findings, especially in public sector research, have only researched corrupt behaviour in expenditure allocation, such as research from Goel and Nelson (1998) or Hessami (2014) which succeeded in proving the relationship between corruption and public expenditure allocation, or Gupta et al. (2001) with respect to corruption in military expenditure. Corruption in the expenditure of the energy, construction, telecommunications and defence sectors is investigated by OECD (2007), whereas Dávid-Barrett and Fazekas (2020) demonstrated that political elites use their influence on public procurement to allocate contracts to business actors who are partisan allies. In this paper, we went further and researched those factors related to the determination of economic-political pressure, which directly affect government procurement fraud, confirming that the higher the political-economic pressure, the more it increases government procurement fraud.

This latter observation is rather evident from the practice of government procurement, which places Ministers/Heads of Institutions who come from political circles as PA/KPA, who with their authority can allocate budgets to procurement that are exposed to conflicts of interest in rent-seeking and can also influence and intervene in the procurement process, especially in the hierarchy of procurement organisations where the authority of the PA/KPA can appoint and dismiss the Head of the UKPBJ and PPK.

Meanwhile, opportunities for council members to secure funds, particularly within ministries or agencies led by political appointees, are reinforced by Article 80 (j) of the MD3 Law (Law No. 17/2014), which states that "Members of the Council have the right to propose and advocate for development programs in their electoral districts". Considering that political parties continued to receive substantial financial donations during the 2024 legislative elections, the following section presents comparative data on political party campaign expenditures in 2024.

These conditions demonstrate that the cost of politics in Indonesia remains substantial and imply that higher campaign spending is associated with greater electoral success, which in turn heightens the likelihood of campaign financiers seeking returns through procurement packages funded by council-initiated deposits and access to state resources.

Meanwhile, the legal framework governing political party financing is set out in Article 34 of Law No. 2 of 2011 concerning Amendments to Law No. 2 of 2008 on Political Parties. The provision stipulates that "political party finances shall come from membership fees, legally valid donations, and financial assistance from the state budget (APBN) or regional budgets (APBD)". Political parties are only prohibited from receiving donations from specific sources as stipulated in Article 339 paragraph (1) of Law No. 7 of 2017 on General Elections. These prohibited sources include: 1. foreign entities; 2. donors whose identities are unclear; 3. proceeds of criminal acts that have been proven by a court

Table 8
Comparison of campaign expenditures of political parties (in IDR)

No.	Parliamentary political party	Campaign fund report	Votes	Non-parliamentary political party	Campaign fund report	Votes
1	PDIP	430.408.187.682	25.387.279	PSI	143.997.570.245	4.260.169
2	Gerindra	388.772.751.181	20.071.708	Hanura	58.466.610.605	1.094.588
3	Golkar	359.193.182.631	23.208.654	PPP	54.629.796.439	5.878.777
4	Demokrat	328.160.565.941	11.283.160	Gelora	33.863.823.448	1.281.99
5	Nasdem	241.782.583.115	14.660.516	PBB	30.708.539.084	484.486
6	PAN	223.225.235.021	10.984.003	Perindo	21.442.223.357	1.955.154
7	PKS	211.154.451.897	12.781.353	Buruh	15.724.456.805	972.910
8	PKB	142.843.025.780	16.115.655	Ummat	11.742.044.582	642.545
9				Garuda	10.565.858.585	406.883
10				PKN	8.465.577.282	326.800
Total		2.325.539.983.248		Total	389.606.500.432	

Source: Campaign Fund Income and Expenditure, General Election Commission Report (2024).

decision with permanent legal force and/or funds intended to conceal or disguise the proceeds of criminal acts; 4. the government, local governments, state-owned enterprises (BUMN), and regional-owned enterprises (BUMD); and 5. village governments and village-owned enterprises (BUMDes).

5.1.4. Additional tests

As for the influence of procurement governance, APIP effectiveness, economic-political pressure to government procurement fraud from the perspective of 1. state losses; 2. procurement ethics violations; 3. meeting the supplier blacklist criteria; and 4. meeting the criteria for unfair business competition, is being shown in Table 9.

Table 9
Results of T-test (partial) on dependent sub variables

Variable	State loss (SL)		Procurement ethics (PE)		Blacklist (BL)		Unfair business competition (UBC)	
	B	Sig	B	Sig	B	Sig	B	Sig
Procurement governance	–0.063	0.035**	–0.124	0.005***	–0.042	0.274	–0.009	0.540
APIP efficacy	–0.135	0.004***	–0.224	0.001***	–0.129	0.031**	–0.046	0.056*
Economic-political pressure	0.326	0.000***	0.447	0.000***	0.154	0.005***	0.059	0.007***
Level of significance: *** (1%), ** (5%), * (10%)								

Source: Compiled by the authors.

These findings reinforce the notion that strong governance mechanisms and effective internal oversight serve as critical deterrents to procurement fraud. The negative relationship between procurement governance and fraud aligns with institutional theory, which posits that transparent rules and accountability structures reduce opportunities for misconduct. Similarly, the significant role of APIP effectiveness supports the view that competent internal audit functions strengthen compliance and enhance institutional integrity (Arena & Azzone, 2009). Conversely, the positive association between political-economy pressure and procurement fraud reflects the influence of rent-seeking behaviour and political patronage often embedded in public sector decision-making (Rose-Ackerman & Palifka, 2016). The absence of significant relationships between procurement governance and the dimensions of supplier blacklist and unfair business competition may suggest that governance reforms have not yet effectively addressed collusive practices or competitive fairness within procurement markets.

A brief overview of the main test results and additional test results in this study can be seen in Table 10 as follows.

Table 10
Overview of hypothesis testing results

No.	Hypothesis statement	Main test	Additional tests			
		FPP	**SL**	**PE**	**BL**	**UBC**
H1	Procurement governance has a negative effect on government procurement fraud	Proven	Proven	Proven	Unproven	Unproven
H2	The effectiveness of APIP has a negative effect on government procurement fraud	Proven	Proven	Proven	Proven	Proven
H3	Political-economic pressure has a positive effect on government procurement fraud	Proven	Proven	Proven	Proven	Proven

Description: FPP (government procurement fraud), ST (state loss), PE (procurement ethics), BL (blacklist), UBC (unfair business competition)

Source: Compiled by the authors.

5.2. Qualitative results

The second step in this research uses qualitative data analysis sourced from the results of interviews and surveys, being carried out to achieve the final research objectives, namely identifying weaknesses in procurement governance and the role of effective APIP, and compiling recommendations to close vulnerable points in the implementation of government procurement.

Based on information from 9 informants, with characteristics of having more than 8 years of experience in processing/supervising government procurement processes (88%), L2/L4 certified (55%), government procurement supervisor (APIP) (55%), who said that there are still weaknesses in procurement governance, including:

- the use of e-procurement, especially the sectoral e-catalogue mechanism, which is considered weak due to limitations in controlling and simplification of sectoral e-catalogue procedures (Informant 1, Informant 3, Informant 4, Informant 9)
- the independence of the procurement unit (UKPBJ) is still under the coordination of the Echelon 2 Work Unit and needs to be upgraded to an independent work unit under the Head/Minister as the Budget User (Informant 1, Informant 3)
- the professionalism of procurement officials who are considered to be still subjective, especially in the assessment of qualifications and evaluation of bids in the selection of suppliers who are not professionals and need to be replaced with the use of artificial intelligence (Informant 3, Informant 4, Informant 9)

While most informants still feel several obstacles to realising effective APIP, including:

- APIP's independence, the scope of procurement supervision from planning to procurement handover, and policy and budget support that are still felt by APIP are absolute requirements that must be met to be able to increase the effectiveness of APIP (Informant 3, Informant 7)
- APIP has not been given the authority to review the budget and review packages for the procurement of goods/services entrusted to the Council that meet the interests of the political elite and the bureaucratic elite, especially the procurement of electoral regional development programs (Informant 2, Informant 3, Informant 5)

Based on interviews with nine informants and surveys of 132 respondents, six key areas of weakness were identified in the procurement system. First, regulatory issues include unclear guidelines for special specifications and imported goods, limited deterrence for blacklisted actors, and gaps in tender and e-purchasing regulations. Second, coordination between procurement actors and internal supervisors remains weak, particularly in objection mechanisms and strategic procurement requiring collaboration among UKPBJ, APIP and the Legal Bureau. Third, procurement system modernisation is needed through AI-based supplier screening, integrated data platforms, unified procurement portals and improved oversight of e-purchasing. Fourth, governance challenges relate to unclear SiRUP arrangements, limited transparency in qualification and bid evaluations, inadequate procurement staffing and competency, insufficient welfare for procurement actors, and the need to strengthen UKPBJ's institutional independence. Fifth, internal supervision requires stronger leadership support for continuous auditing, greater budget allocation, expanded probity audits, enhanced authority for supervisory reviews, and a more secure whistleblowing system, as well as strengthening cooperation with law enforcement agencies in responding to complaints that suggest the occurrence of criminal acts of corruption. Lastly, national-level reforms are needed to develop anti-fraud and anti-conflict of interest systems based on potential fraud analysis and red flag analysis.

6. Conclusion, limitation, implication and recommendation

This study provides empirical evidence that procurement governance is not the only influential factor in reducing government procurement fraud. In addition, one of the contributions of this study is to visualise the role of internal supervisors (APIP), and that political-economic pressure is still dominant and always interacts in every government procurement.

In addition, another contribution of this research is that it has developed procurement fraud parameters which are an index/combination of four procurement fraud perspectives, which are carried out by internal procurement actors and/or external procurement actors, namely: 1. state losses (State Audit Agency); 2. violations of procurement ethics;

3. fulfilling the elements of the procurement blacklist; and 4. collusion which gives rise to unfair business competition.

From the research methodology, this combination research has succeeded in exploring various weaknesses in policies and procurement practices, especially in ministries and agencies that deal with the field of natural resources and high technology, including: 1. weaknesses in regulations/standards; 2. weaknesses in the relationship between procurement actors and APIP; 3. weaknesses in the modernisation of the procurement system; 4. weaknesses in procurement governance; 5. internal supervision; and 6. national supervision.

As such, we offer several important implications for policymakers, procurement practitioners and oversight institutions. The findings indicate that strengthening procurement governance alone is insufficient to reduce procurement fraud; political-economic pressures and the role of APIP remain critical determinants. This underscores the need for a more holistic anti-fraud strategy that integrates governance reforms with stronger internal audit capacity and safeguards against political interference. Policy recommendations that can be implemented include: strengthening APIP's capacity and independence through the establishment of an audit committee; issuing specific procurement regulations for high-risk sectors in collaboration with procurement, legal and supervisory experts; modernising e-procurement systems by enhancing interoperability, analytics and automation; improving coordination in the handling of procurement fraud cases among procurement units, APIP, BPK RI, law enforcement agencies, and KPPU; ensuring accessible and responsive complaint mechanisms; and expanding oversight to local governments through a strengthened monitoring and evaluation framework.

There remain several factors influencing fraud in government procurement that were not explored in this study. Consequently, the researchers propose examining three additional influential factors: 1. assessing the effectiveness of external procurement oversight bodies, such as the Supreme Audit Agency of the Republic of Indonesia (BPK RI), law enforcement agencies, the Business Competition Supervisory Commission (KPPU), and community-based oversight; 2. evaluating the effectiveness of public procurement complaint channels; and 3. analysing the patterns and interactions between internal and external oversight institutions in combating procurement-related corruption. Finally, we recommend expanding the scope of future studies beyond central government institutions to include local government agencies as well.

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Invisible Markets, Visible Weaknesses

The Institutional Roots of Informal Economy in Southeast Europe

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Abstract: The informal economy has been a consistent threat to development policy, particularly in Southeastern Europe, where institutional vulnerability and macroeconomic fluctuations are common. This paper examines institutional and macroeconomic factors behind informality across 2012–2024, denoting control of corruption, effectiveness of anti-money laundering, inflation, unemployment, contract enforcement, and economic freedom. Employing panel data from well-regarded international sources, the paper estimates the econometric result using the Arellano–Bover and Blundell–Bond System GMM estimator, which incorporates the endogeneity, unobserved heterogeneity, and the dynamic effects. Results reveal strong path dependence, as lagged informal activity is statistically significant. Corruption control and the enforcement of contracts lead to lesser informality, whereas AML controls, surprisingly, enhance informality; hence, there are gaps in institution implementation. Inflation and unemployment heighten the informal behaviour, whereas economic freedom checks such behaviour. The research gap discussed is the lack of a combination of institutional and macroeconomic approaches to informality in the post-transition economy. The results presented provide practical implications for strengthening and formalising institutions.

Keywords: informality, institutional quality, macroeconomic indicators

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1. Introduction

The informal economy (IE) is a phenomenon that has existed steadily in most developing economies worldwide, and it also exists in Southeastern Europe (SEE), where institutional weaknesses and unequal economic transitions have developed a parallel economic system that operates freely beyond official regulations. The institutional sources of the informal economy are challenging in the context of SEE, which has recently undergone an increase in the speed of digitalisation and fintech growth. As SEE countries continue to face the dual pressures of socio-economic transformation and institutional reforms, the informal economy plays a critical role in shaping individual livelihoods and state capacity (Buitrago et al., 2024; Barra & Papaccio, 2024; Deléchat & Medina, 2021). General interplay of institutional quality and informality has been well-established in existing research works (see e.g. Krivins et al., 2025), but specific channels through which corruption control, policies on anti-money laundering (Durguti et al., 2023), inflation, unemployment, and measures on contract enforcement, and the specific channels through which economic freedom exerts its influence have not yet been fully explored in the SEE region (Alidemaj et al., 2025).

SEE is a good example to investigate these trends because this region is highly informal, politically and economically unstable due to the post-communist transition process, and has fundamental problems that concern corruption and low effectiveness of the judiciary (World Bank, 2025). Saha et al. (2021) demonstrated that the reasons are particularly related to corruption, which discourages reliance on formal institutions and strengthens the use of the informal sector and facilitates shadow financial transactions. Meanwhile, the capability of anti-money laundering (AML) rules to successfully integrate the financial technologies (FinTech) into the formal regulatory circles plays a decisive role in preventing illegal financial flows and promotes transparency as a specific phenomenon of the financial system (Usman et al., 2025). What is more, inflation and unemployment, which remain constant economic issues in the region, are push variables that drive people towards the informal sectors to gain a source of income in cases of fluctuating monetary conditions.

According to Maiti and Bhattacharyya (2020), the main institutional forces that make a difference in shaping a market relationship are contract enforcement and economic freedom. Ineffective contract enforcement minimises predictability and weakens official agreements, hence encouraging ineligible arrangements. Furthermore, the low economic freedom levels resulting from inefficient bureaucratic processes and government restrictions encourage the expansion of informal markets by requiring entrepreneurial activity within legal boundaries. Such relations indicate a complex interplay whereby the inefficiencies in institutions and economic pressures reinforce each other to preserve the existence of a large informal sector in SEE.

SEE is characterised by a unique combination of post-socialist legacies, EU integration pressures, and fragmented state capacities, making it an ideal instance for studying informal economic dynamics. Although some countries like Slovenia and Croatia have already achieved substantial progress to bring their practices in line with those observed in the EU standards, others, such as Albania, Kosovo, Bosnia and Herzegovina,

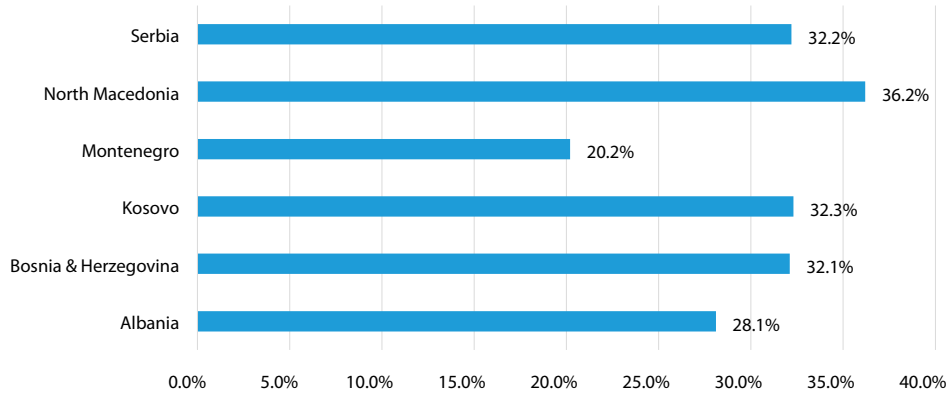

Figure 1

Informal economy tendencies

Source: World Economics, 2025

Montenegro, North Macedonia, or Serbia, are still struggling with their institutional underdevelopment and the high rate of informality. As such, due to the comparatively lower levels of informality and better institutional structure, Slovenia and Croatia are excluded from the present analysis, and subsequently, we are focusing only on six SEE countries, namely: Albania, Kosovo, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia.

This variation gives the possibility to compare countries and find the best practices. Given the heterogeneity across these six SEE countries in terms of institutional quality and macroeconomic performance, a regional perspective is crucial for understanding informal dynamics. Such a variation can serve as a fruitful ground for the comparative empirical analysis and the determination of best practices in the region. The visualisation of the dynamics of the informal economy is represented in Figure 1.

Based on the publication of the World Economic Forum 2025, North Macedonia reached the highest value in terms of the informal economy, at 36.2%, and the lowest value recorded was 20.2% in Montenegro.

This research aims to empirically address the institutional and macroeconomic factors that determine the informal economy in SEE, focusing on the degree of corruption control, anti-money laundering effectiveness, inflation, unemployment, contract enforcement and economic freedom. The dependent variable is the informal economy, which is the informal economic activity covering all activities that are not registered and/or regulated in accordance with the government. By inspecting this interplay via panel data analysis from SEE countries, the research seeks to provide a more nuanced and thoughtful examination of the interplay across institutional quality, economic stability and informality. The research is guided by the following questions:

> RQ1: In what way do institutional quality (control of corruption, AML, contract enforcement and economic freedom) influence the prevalence of the informal economy in SEE?

RQ2: What are the effects of inflation and unemployment on the informal economic activities in SEE?
RQ3: How does the interaction between institutional capacity and macroeconomic stability shape the development of informal markets amid digital transformation?

The novelty of the research lies in its integrated, interdisciplinary approach toward bridging macroeconomic and institutional variables in a fintech-enabled environment. Unlike other studies that are closer to treating the informal economy as an opposite construct to formality, this research takes into account the grey areas where formal and informal interactions take place through the emergence of digital platforms and the new financial technologies. It also helps in evaluating the institutional performance in combination with macroeconomic instability, which would not otherwise have been done. Moreover, regional individualities of SEE that are being considered in the analysis include the post-transition institutional background, the socio-political diversity of the region and the international implications of the region as a part of European integration. In this regard, it provides contextual and inclusive knowledge to other areas in the same situation of structural and institutional restrictions. As such, this research makes a contribution to existing arguments in institutional economics, development economics, and many other related areas by offering policy agendas that could be used to achieve better governance and macroeconomic management in order to tackle informality.

2. Theoretical background

The informal economy remains a persistent and complex challenge across SEE countries. In the repercussions of socialism, countries in the region have experienced difficult transitions, marked by institutional weaknesses and macro-economic instability factors that have driven the growth of economic activities

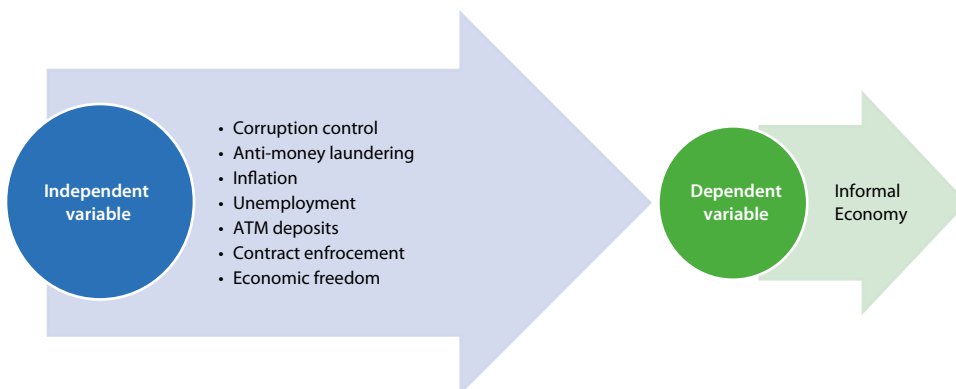

Figure 2
Conceptual framework

Source: Compiled by the authors.

outside formal state regulation. Understanding the primary drivers and dynamics of informality in this politically fragile region is crucial for developing effective policy responses. The coordination of the actions at the regional and international levels plays a major role in enhancing economic formalisation, fostering sustainable development and enhancing institutional flexibility. Instead of literature evaluation, we are sketching out the conceptual framework that drives this research, subsequently aligning it with the research structure.

2.1. Institutional quality and informality

Recent studies show that institutional quality in the form of the informal economy is gaining more and more popularity. Asllani and Schneider (2025) state, for instance, that weak governance, complex taxation systems, and corruption are among the most important causes of informality in those six EU economies they analysed. Based on their findings, they claim that institutional confidence and proper enforcement of the law are the two major aspects that can be used to reduce the informal economic activities. Similarly, Littlewood et al. (2018), having the idea of institutional asymmetry introduced for SEE, conclude that a mismatch between official legislature and unofficial norms gives rise to the emergence of such behaviours as those of cash-in-hand payment and tax evasion. They emphasise, therefore, that with a view to reducing informality and to foster compliance with formal economic rules, restoring institutional credibility is a must in such developing economies.

Beyond this, bearing in mind the broader context of regulatory enforcement sustainability, money laundering exerts significant consequences by steering businesses toward tax evasion and informality. In this regard, Khelil et al. (2024) report diverse effects of anti-money laundering (AML) policies, explicitly emphasising that weak enforcement levels increase the firms' propensity to engage in informal activities. Similarly, Andiojaya (2025) presents empirical facts that strong AML practices can significantly lower risks linked to financial offences, which is why the hypothesis that efficient AML practices can discourage crime participants by preventing access to illegal funds is correct.

Additionally, D'Agostino et al. (2023), working with a sample size of 153 economies between 1995 and 2017, explicitly note that there is a negative interplay between economic freedom and informal economy, and especially in case of low-democracy countries, economic freedom has negative effects, but when it comes to highly democratic countries, economic freedom has positive impacts of helping to curb the level of corruption. Similarly, Krivins et al. (2025) explore the nexus of ethics and corruption in the EU and highlight how institutional weaknesses perpetuate informal practices, especially in post-transition economies like those in the Western Balkans. Their research provides evidence on how institutional weaknesses endure informal practices, particularly in post-transition economies, and their results underscore that fragile institutions not only enable informal behaviour, but also discourage efforts toward formalisation and economic transparency.

2.2. Mapping macroeconomic instability and informal employment

Macroeconomic instability, particularly inflation and unemployment, has been recognised as a key driver of informal employment. As such, Yao (2024) presents an augmented factor model relating economic downturns to rising informality, exclusively in low-income countries, that identifies these factors as prominent drivers of informal employment. The research underlines how deteriorating economic conditions drive individuals and businesses toward informal practices as a coping mechanism in the absence of stable institutional backing. In a like manner, Maiti and Bhattacharyya (2020) argue that ineffective contract enforcement and low economic freedom encourage informal arrangements. Their findings are particularly relevant for the SEE countries, where bureaucratic inefficiency and government restrictions are commonplace, which underlines that enhancing institutional efficiency and agricultural development are among the solutions to the deterrence of informal activities and the encouragement of formal involvement in the economy.

Finally, the World Bank (2025) notes that inflation and unemployment remain chronic problems in the Western Balkans. Such economic forces usually force people into the informal sector in an attempt to have economic security. The report expresses that without a robust social safety net and policies to include workers in the labour market, informality serves as a survival mechanism for the vulnerable citizens.

2.3. Regional perspectives from the Western Balkans and Southern Europe

According to the conclusion of the Altax Institute Report (2025) of the Albanian, Kosovar, and North Macedonian economies, the main factors of informality are corruption, inefficient taxation, and cash-related practices. The level of the challenge is that the informal economy in such countries is estimated to be about 30% to 35% of GDP, which underscores the seriousness of the problem. Additionally, the CREDI (2024) examines economies in the Western Balkans and illustrates how regulatory gaps and low enforcement of contracts allow high levels of informal employment, particularly in temporary work sectors such as food delivery and car-sharing services. The research underscores the necessity for targeted regulatory reforms to address informality in these fast-growing, yet vulnerable sectors of the labour market.

In addition, surveys of informal employment in the economies across the Western Balkan countries highlight how governing gaps and weak enforcement mechanisms contribute to high levels of informality, mainly in temporary work sectors such as food delivery and basic transportation platforms. It demands targeted regulatory reforms, including being in line with the EU directives, to better protect workers and reduce informality in these swiftly growing sectors. Barra and Papaccio (2024) evaluated the levels of institutional quality in SEE and discovered that the increase in the quality of the regulation systems and the governance system has a great impact on reducing informal economic activity. Their analysis gives emphasis on the significance of institutional

capacity and institutional rule of law as a strategic move to reduce informality and to improve formal economic involvement.

3. Research methodology

3.1. Study sample

This research aims to observe the interplay between the informal economy and a combination of institutional and macroeconomic indicators, by examining their influence in the context of either fostering or curbing economic informality. In this regard, a panel data analysis has been undertaken on econometrics involving the time between 2012 and 2024. The selection of both the time frame and the countries included in the study was guided by the availability of complete and reliable data, thus limiting the sample to only those countries that presented no data gaps throughout the entire period under analysis. As a result, the research emphasises a balanced panel consisting of six SEE countries, namely, Albania, Kosovo, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia. The data have been obtained from internationally recognised and reliable sources, providing a solid foundation for econometric analysis. Precisely, data on the informal economy were obtained from the International Monetary Fund, particularly from the World Economic Outlook report, where informality is represented by the share of the informal economy as a percentage of GDP. The control of corruption was retrieved from the World Bank's database, using the estimated value, which was then converted into a percentage format for comparative purposes. The effectiveness of AML measures is measured through the Basel AML Index, which operates on a risk scale from 0 (low risk) to 10 (high risk). On the other hand, macroeconomic indicators such as inflation and unemployment were obtained from the World Bank and are expressed as percentages. The final two indicators included in the analysis, contract enforcement and economic freedom, were obtained from the Fraser Institute, following the methodology defined by Gwartney et al. (2023, p. 15). A wide-ranging summary of all indicators, including their definitions, data sources, and abbreviations used, is visually presented in Table 1.

Table 1
Description of the variables

Description		**Acronyms**	**Source**
Dependent variable	Informal economy	IE	IMF – World Economic Outlook
Independent variables	Corruption control	CC	World Bank
	Anti-money laundering	AML	Basel AML index
	Inflation	INF	World Bank
	Unemployment	UEMP	World Bank
	Contract enforcement	CE	Fraser Institute
	Economic freedom	EF	Fraser Institute

Source: Compiled by the authors.

Inspired by the current body of econometric evidence, the research relies on the works that imply that the informal economy can be viewed as an income safety net for marginalised groups of people. On a larger scale, the studies conducted earlier have brought concrete evidence that the developing countries are more likely to be characterised by the existence of a more extensive informality and thus they are more likely to be characterised by higher levels of income inequality (Aspachs et al. 2022). Similarly, according to the findings of Esaku and Mugoda (2025), inflation and unemployment still lie among the most significant factors that force people into participating in the informal economy. Nevertheless, other institutional indicators also play a critical role in shaping the structural conditions that either incentivise or constrain informality in the economy.

3.2. Data analysis approach

According to the objective stipulated above, the purpose of the research is to evaluate how institutional quality and macroeconomic parameters are reflected in the informal economy of the Western Balkan countries, and how they influence it. In the academic field, the effect of the enforceability of institutional and macroeconomic indicators as presented in the informal economy plays a central role in reducing the level of informality (Barra & Papaccio, 2024). Considering that the number of observations is not very large, this has been one of the main reasons for applying the GMM system. In such cases, the location of the first difference of the data and the appropriate use of instruments must be taken into account in order to eliminate endogeneity concerns, which are discussed using the Hansen test. Consequently, based on the panel of countries and the time range during which the research is being undertaken, the research uses the GMM methodology, whose origin can be traced back to Arellano and Bond (1991) and has been amended by Blundell and Bond (1998).

The study's approach is based on the instrumental variables used to distinguish the correlation between institutional quality, macroeconomic indicators, and the informal economy. The GMM approach is preferred because the use of the standard Ordinary Least Squares (OLS) method faces serious issues with endogeneity bias. Moreover, in both fixed and random effects models, the lagged dependent variable correlates with the error term, even when errors are not autocorrelated (Blundell & Bond, 1998). The other motivation behind the use of the dynamic approach relates to the interdependence between the number of periods (T) and panel units (N), where, in the given study, T > N, therefore requiring GMM to correct such matters (Phillips, 2022; Alvarez & Arellano, 2003).

Endogeneity problems arising from the interaction between independent variables and the informal economy, as well as autocorrelation, unit-specific heteroskedasticity, and omitted variable bias are addressed through the GMM approach. The overall aim of this method is to mitigate possible endogeneity bias (Blundell & Bond, 1998; Hansen, 1982). The GMM approach provides asymptotically unbiased estimates of t-statistics without requiring heteroskedasticity assumptions in the regression equation and is efficient for

panels with a short time dimension (Arellano & Bond, 1991). The dynamic panel model is parameterised as follows:

$$\gamma_{it} = \alpha Y_{it-1} + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \mu_i + \varepsilon_{it}$$

where Y_{it} represents the informal economy; $\beta_1 X_1 - \beta_n X_n$ denote vectors such as CC, AML, INF, UMP, CE and EF; μ_i are country fixed effects; and ε_{it} is the error term, with *i* and *t* indicating country and time, respectively. In this study, the specific model includes first differences of variables:

$$\Delta IE_{it} = \alpha \Delta IE_{it-1} + \beta_1 \Delta CC_{it} + \beta_2 \Delta AML_{it} + \beta_3 \Delta INF_{it} + \beta_4 \Delta UEMP_{it} + \beta_5 \Delta CE_{it} + \beta_6 \Delta EF_{it} + \Delta\mu_i + \Delta\varepsilon_{it} \quad (2)$$

The consistency of the GMM approach depends on the validity of lagged explanatory variables as instruments, which is tested using specification tests proposed by Arellano and Bond (1991) and Arellano and Bover (1995). The Hansen test evaluates instrument validity through moment conditions (Baum et al., 2003; Hansen, 1982). Failure to reject the null hypothesis supports the model. The diagnostic test for serial correlation examines whether the error term is serially correlated. In the GMM approach, this test validates, in particular, the second order of the serial correlation test of the residuals (Arellano & Bond, 1991). Such an association signifies weak instruments, and it implies that one should employ higher-order delays as instruments. The GMM approach is an equally well-adopted method in the new literature on financial development (Eng & Lim, 2025).

3.3. Research limitations

It should be noted, though, that there exist certain underlying limitations to this research, which is constrained by a relatively small sample size of only 78 observations and the incorporation of multiple variables associated with digitalisation. Nonetheless, these restrictions cannot in any way affect or impede the upward trend of the results presented. In this context, the econometric approach has been modified according to the quantity of observations, addressing uncertainties regarding these constraints.

4. Results and discussion

4.1. Descriptive statistics

In Table 2, the narrative statistics of the crucial variables employed during the analysis can now be seen, which gives an idea about their distribution and magnitude as compared to each other. The informal economy has a mean of 0.3062 with moderate variation in the measures (standard deviation = 0.0538), which shows that 30% of the

Table 2
Descriptive statistics

Varibles	Obs	Mean	SD	Min.	Max.
Informal economy	78	0.3062	0.0538	0.2420	0.4400
Corruption perception	78	3.6554	0.1016	3.4339	3.8286
Anti-money laundering	78	4.7228	1.0467	2.0700	6.3300
Inflation	78	0.0292	0.0361	–0.0158	0.1420
Unemployment	78	0.1811	0.0692	0.0739	0.3526
Contract enforcement	78	3.4048	0.3194	2.8500	4.0600
Economic freedom	78	7.2164	0.3668	6.5600	7.7300

Source: Compiled by the authors.

total economy is brought about due to informal actions of agents that do not operate within formal regulatory backgrounds. This reveals organisational failure within governance and enforcement in accordance with what has been discovered to be in transition economies, where informality continues to be a stumbling block.

Corruption control is relatively low and averages 3.6554 (SD = 0.1016). This means that perceptions of corruption are not very dispersed, which suggests that they are quite comparable across the cases that are observed. The slight range (3.4339) indicates the systemic, rather than localised problems with governance, and supports the interpretation that the quality of the institutions is quite homogenous but, at the same time, problematic to a moderate degree. The effectiveness of anti-money laundering (AML) has an extreme variability scenario with a range of 2.07 to 6.33, indicating relatively weak (2.07) to relatively strong (6.33) levels of enforcement. This difference indicates a lack of even institutional capacity within the countries under investigation, as presented in the unfairness in regard to adhering to international financial integrity rules and standards.

The inflation rate is modest (0.0292 on average) with little and positive dispersion (SD = 0.0361), indicating persistent stable movement of prices. Nonetheless, the maximum of its value (0.1420) suggests that there are some occasional inflationary pressures that threaten to destabilise the monetary situation and affect informality by facilitating diminished purchasing power. The unemployment level is on average 18.11% (SD = 0.0692), and there is a significant range (7.4% to 35.3%). High unemployment has also been found to coincide with a higher informal activity as people move to other alternative sources of income besides formal employment, thus supporting the dual-sector economic theory. Contract enforcement is 3.4048 (SD = 0.3194), which means the moderate efficiency of the judicial system with a certain cross-country dispersion. Improved enforcement mechanisms tend to discourage informality by increasing the cost of non-compliance, an aspect that may show the significance of institutional changes. Lastly, economic freedom is quite high with a mean value of 7.2164 and a standard deviation of 0.3668. This implies that despite the liberalised markets in most economies, regulatory inconsistencies still exist, which may impact both the formal businesses and the shadow market induction.

4.2. Multicollinearity analysis

The validation behind the examination of Variance Inflation Factors (VIF) is given in the response, which is provided by Table 3 indicating the evaluation of the diagnosis of the occurrence of multicollinearity between the independent variables.

Table 3
Variance inflation factor

Variables	VIF	1/VIF
Contract enforcement	3.49	0.286386
Anti-money laundering	2.14	0.466471
Economic freedom	2.13	0.470307
Unemployment	1.40	0.712863
Inflation	1.28	0.783991
Corruption perception	1.04	0.965452
Mean VIF	**1.91**	

Source: Compiled by the authors.

In econometric terms, serious multicollinearity emerges when VIF is greater than the critical value of 10, while values above 5 are considered a warning sign (Gujarati & Porter, 2009). At this point, its largest value is related to the contract enforcement (VIF = 3.49), which remains below the critical threshold value and states the absence of such critical multicollinearity. The results of the rest of the parameters covered in the study investigation are presented individually in respective statistics, which is an indication of the relative independence of such variables. The coefficient of VIF (1.91) is very modest, implying the econometric models used are not associated with extreme overlap of information through the explanatory variables. This makes coefficient estimates stable and interpretations reliable, consequently boosting the statistical validity as well as the consistency of the estimation method (Wooldridge, 2016).

4.3. Unit root analysis

Based on the nature of the data applied in our specific case and the need to further advance the analysis to evaluate whether the data are stationary, it is an additional advantage to perform the Levin–Lin–Chu unit root analysis. Although within the GMM framework, non-stationarity is not considered a permanent problem, since the GMM procedure is applied to a short time panel where N > T and all variables are automatically transformed into first differences, we still conducted a unit root test to verify their stationarity.

Table 4
Levin–Lin–Chu unit root

Variable	At level		1st difference	
	Statistic	*p-value*	*Statistic*	*p-value*
Informal economy	0.8305	0.7969	–7.7531	0.0000
Corruption perception	–1.1375	0.1277	–3.3198	0.0003
Anti-money laundering	–2.0660	0.0194	–3.5592	0.0002
Inflation	–3.8545	0.0001	–4.7337	0.0000
Unemployment	–3.6418	0.0001	–6.4434	0.0000
Contract enforcement	–0.6160	0.2690	–5.7225	0.0000
Economic freedom	–2.0796	0.0188	–6.0711	0.0000

Source: Compiled by the authors.

The results are presented in Table 4. The findings indicate that most variables are non-stationary at the level, as their p-values exceed $\alpha > 0.05$, except for inflation and economic freedom. Nevertheless, after transforming them into first differences, in line with the rule of thumb I(1), they completely became stationary. This modification from I(0) to I(1) is common in macroeconomic panel data, justifying the use of the GMM method to avoid spurious results due to non-stationarity (Levin et al., 2002; Roodman, 2009). Based on the determination of the model stability beyond the unit root analysis, it becomes imperative to determine whether the variables within the model constitute a long-run relationship. This is to address the deficiencies of spurious regressions in panel analysis and to theoretically support the use of dynamic models.

Table 5
Westerlund test

	Statistic	p-value
Variance ratio	3.6668	0.0001

Source: Compiled by the authors.

For this reason, the Westerlund cointegration test was applied, yielding a statistic of 3.6668 and a p-value of 0.0001, thereby rejecting the null hypothesis of no cointegration. The outcome directs that the variables have a long-run equilibrium and validates the use of the Arellano–Bover and Blundell–Bond method for dynamic estimation. Confirming cointegration strengthens the model specification and ensures that the GMM estimates are reliable, effectively addressing both endogeneity and heterogeneity within the macroeconomic panel context (Westerlund, 2007).

4.4. Validation of the estimated model

As a result, before interpreting the coefficients of the Arellano–Bover and Blundell–Bond GMM approach, it is essential to evaluate its adequacy and robustness through diagnostic tests recommended by the econometric landscape. The results presented below indicate that the model is constructed in accordance with methodological standards. The initial diagnostic test in our case is the Wald chi² test (*ρ-value* = 0.0000), which shows that the overall model is statistically significant and that institutional and macroeconomic factors contribute to explaining the informal economy. In addition, a robust version of the estimation was applied to perform the $AR_{(1)}$ and $AR_{(2)}$ tests, which assess first- and second-order autocorrelation. The results obtained for $AR_{(1)}$ with a *ρ-value* = 0.052 are slightly above the standard level of the 0.05 threshold, representing a possible but not critical presence of first-order autocorrelation, a conclusion usually accepted in the literature since first differences are expected to exhibit $AR_{(1)}$. In the meantime, $AR_{(2)}$ with a *ρ-value* = 0.152 is statistically insignificant, suggesting the absence of second-order autocorrelation and satisfying one of the fundamental requirements of GMM. Lastly, the Hansen-J test (*ρ-value* = 0.340) confirms that the instruments used are valid and there is no evidence of overidentification, meaning that the instruments are neither corrupted nor invalid (Hansen, 1982). As an overall conclusion, the application of these tests and the results obtained imply that the model is correctly specified and that the selected instruments are appropriate for the analysis, providing a solid basis for interpreting the coefficients and drawing reliable econometric conclusions.

Table 6

Econometric estimation

	Arellano–Bover and Blundell–Bond		**Arellano–Bover and Blundell–Bond (Robust)**	
	B	ρ ≥ [z]	β	ρ ≥ [z]
Informal economy	0.9676	0.0000	0.9676	0.0000
Corruption perception	–0.0008	0.0170	–0.0008	0.0170
Anti-money laundering	0.0001	0.0030	0.0001	0.0030
Inflation	0.0012	0.0090	0.0012	0.0090
Unemployment	0.0077	0.0000	0.0078	0.0000
Contract enforcement	–0.0010	0.0000	–0.0011	0.0000
Economic freedom	–0.0088	0.0000	–0.0088	0.0000
Constant	0.0178	0.0000	0.0178	0.0000
Diagnostic test for model adequacy				
Wald chi2	3.4601	0.0000	3.4516	0.0000
AR(1)	1.8600			0.0520
AR(2)	1.4300			0.1520
Hansen-J test	2.9200			0.3400

Source: Compiled by the authors.

Given the high coefficient of the lagged dependent variable (0.9676), the model suggests strong persistence in informality levels. The long-run multipliers were computed as $\beta/(1-\alpha)$, indicating that the long-term effects of explanatory variables are substantially larger than their short-term impacts. This reflects the structural nature of informality and its slow adjustment over time. This provides important insights for policymakers, highlighting that changes in determinants such as regulatory quality, the rule of law, or economic variables will affect informality gradually but continuously over time, and therefore, policy interventions need to take these accumulated effects into account to achieve meaningful and sustainable results.

4.5. Findings and interpretation

This section proceeds with a detailed examination of the empirical results, aligning them with the research questions expressed in the introduction. In this regard, particular emphasis is placed on addressing RQ1; the findings indicate that institutional quality, measured by control of corruption, anti-money laundering (AML), contract enforcement and economic freedom variables, has a nuanced impact on the informal economy in the SEE region. This is exposed by a slight decrease in the informal economy due to an increase in control of corruption ($\beta = -0.0008$, *ρ-value* = 0.0170), suggesting a counterintuitive finding. Explicitly, the demonstrated results show that for every unit decrease in control of corruption, it is reflected in a decrease in the informality rate of 0.0008 units. From an economic perspective, the presented result implies that improvements in corruption control are in their initial stages, and this dynamic may encourage greater formalisation within the economy. Therefore, in this view, by influencing the strengthening of institutional credibility and reducing the opportunities for profit-making or informal transactions, undertaking better anti-corruption actions or measures creates an environment where businesses and individuals are more likely to operate within the formal sector.

As stated by Momot et al. (2023), corruption in the public sector is the reason why corruption in the field of business also increases, which allows the growth of the informal economy or the shadow economy. This is stressed by Dreher and Schneider (2010) who argue that the informal economy widens the corruption level in low-income economies and narrows the level of corruption in high-income economies, which creates a diverse internalisation of corruption perception within the SEE economies. Their argument is also supported by some recent findings, suggesting that the relationship between corruption and the shadow economy is bidirectional and depends on a country's institutional environment (see e.g. Nguyen & Liu, 2023).

Conversely, an IMF (2023) audit of the fund's anti-money laundering and combating the financing of terrorism strategy has examined the adverse effect of over-regulated AML policies. Despite being well-intentioned, these regulations can lead central banks to de-risking practices, which push individuals and small businesses into unregulated channels, hindering financial inclusion. This idea supports the slight increase in the informal economy in the SEE region by stronger AML measures ($\beta = 0.0001$, *ρ-value* = 0.0030).

Conversely, higher contract enforcement ($\beta = -0.0010$, *ρ-value* = 0.0000) and economic freedom ($\beta = -0.0088$, *ρ-value* = 0.0000) display a more substantial reduction in the informal economy in the SEE region, which is supported by the scholarly literature. As such, Jahan et al. (2020) argue that ensuring contract enforcement decreases transaction costs and uncertainty in efficient institutions, making the formal economy more reliable and profitable. And the reason relies on the benefits brought by operating within the formal system, such as legal protection, larger markets and access to credit, which outweigh the incurred costs. Additionally, when transaction costs are high because of a lack of economic freedom (Wang, 2022), the incentive for the informal economy to surge increases.

Consequently, the offered coefficients and their statistical significance are not only supported by economic theories but also reflect the particular institutional and economic dynamics within the context of the SEE economies. The SEE region is in a transitional phase from centrally planned economies to market-based systems, where legal and institutional frameworks are weak (Boguslavskyy et al., 2025). A transition policy 'recipe' might not be effective for each country of the transitional economies, as suggested by Round (2009) and restated by the IMF (2021) and the World Bank (2025). Instead, to overcome the flaws in the process from communist regimes to capitalism, two approaches to economic reform are prominent.

The first is the so-called 'shock therapy', a radical approach that has been proven successful in Poland's market transition (Piatkowski, 2018; Ptak, 2025). Or, second, gradualism, which is a more sequenced approach, with China as its leading example (Chen & Zha, 2023). Based on a gradual approach, building formal institutions to establish a robust market economy allows policymakers in the SEE region to address the difficulties of liberalisation measures while enhancing policies to diminish the informal economy.

Regarding RQ2, the results suggest that macroeconomic factors, measured by inflation and unemployment variables, have a significant impact on the informal economy in the SEE region. A constructive and significant inflation coefficient ($\beta = 0.0012$, *ρ-value* = 0.0090) indicates that a rise in inflation inflates the informal economy. This is a common finding supported by the literature. The argument is based on real wages and savings erosion because of the high volatility of inflation, especially in the low-income countries where people have less access to financial instruments. As stated by Ohnsorge and Yu (2021), the escalation of inflation encourages people to engage in cash-in-hand and informal payments, where the price can be changed swiftly to prevent people from losing their purchasing power due to the maintenance of their money in formal bank accounts, where they are often locked at fixed prices or not fast to respond to inflation. Since a significant portion of the SEE region may be financially excluded, inflation's effects make them more vulnerable.

Besides, a strong and positive unemployment coefficient ($\beta = 0.0077$, *ρ-value* = 0.0000) indicates that individuals choose the informal sector for work and survival, which increases the informal economy. This finding is intuitive and supported by the dual labour market theory (Doeringer & Piore, 1971), which conceptualises two segments in the economy. The formal sector, characterised by high wages and benefits, and the informal sector by low pay, job insecurity and easy entry. When the formal sector jobs are scarce, the supply of

labour in the informal sector increases. Some more recent research has supported these claims, e.g. the one conducted by Deléchat and Medina (2021), who discuss the role of the informal economy as a 'buffer' or safety net for individuals excluded from the formal economy.

Therefore, the findings of this study suggest that macroeconomic instability is a robust driver of informal activities in the SEE region. To counteract these effects, transformative policies for financial inclusion strategies to foster economic resilience and growth (see e.g. Demirguc-Kunt et al., 2022) might be implemented by policymakers. The benefits of such policies and strategies reverberate throughout the argument against the safety net of the informal economy, which becomes a 'safety trap' that offers low productivity, low wages and a lack of social protection, preventing long-term economic development (Colombo et al., 2019).

Moreover, recent regular economic reports in the Western Balkans (World Bank, 2022; World Bank, 2024) suggest that tightening monetary policies by increasing interest rates prevent the SEE region from becoming de-anchored or having difficulties in overcoming long periods of inflation. Since the SEE region has experienced shocks in consumption demand compelled by Russia's invasion of Ukraine, structural labour market reforms such as reducing labour market rigidities and bureaucratic burdens can lower the cost of formality, pulling out businesses and individuals from the informal sector.

With reference to RQ3, a synthesis of the results will be used to provide an interpretation. Nguyen and Liu (2023) and Ricci et al. (2025) argue that digital transformation is not a direct entry to the formalisation of the economy. When existing institutional frameworks are weak, digital technologies such as FinTech create more efficient, but informal digital sectors. This could be translated into difficulties for countries to increase tax revenue and enhance the legal protection for individuals. Within the context of low-income countries, the informality of the digital sector exacerbates the informal economy. Reports from Clark et al. (2025) and Klapper et al. (2025) state that, although digital transformation might support financial inclusion in developing countries and assist with the reduction of informality in digital payments due to the traceability of transactions, it can only be achieved when accompanied by strong legal regulatory frameworks.

In contrast, strong legal regulatory frameworks could also hinder the very workers that labour policies intend to protect. Dolado et al. (2025) discuss that well-intended policies to regulate digital platform workers, such as delivery riders, reduce employment opportunities, wages, and flexibility if not carefully designed and established. They conclude that addressing employee status misclassification while expanding demand for regular employment through fiscal incentives for compliance can protect workers without eroding the benefits of digital platform work. Therefore, the interaction between institutional capacity and macroeconomic stability influences the development of informal markets within the digital transformation process. Within the context of the SEE region, a well-rounded and gradual regulatory framework transformation might be the key element to contribute to the effort in reducing the informal economy while benefiting from the digital transformation path. This argument is supported by the learn-by-doing method and regulatory 'sandbox' approach (Ricci et al., 2025; Jeník & Duff, 2020), which

states that a gradualist testing strategy is essential for adopting policies to fast-evolving digital innovations that build paths to formalisation instead of creating barriers.

5. Conclusion

The study's findings shed some light on the complex network of interconnections in SEE's informal economy, which includes institutional behaviours, macroeconomic conditions, and magnitude. Our findings are reinforced by empirical evidence and can withstand challenges such as endogeneity, heteroscedasticity, and autocorrelation because we employed a dynamic panel and the GMM approach. The findings confirm both theoretical expectations and some counterintuitive effects typical of transition economies. These are as follows.

First, institutional variables have a multidirectional effect on the informal economy. Conversely to popular belief, corruption control and anti-money laundering (AML) measures do not always reduce informality. In certain cases, disproportionate regulation or the perception of anti-corruption measures can provoke de-risking, financial exclusion, and the movement of businesses into the shadow economy. On the contrary, factors such as contract enforcement efficiency and the level of economic freedom demonstrate a persistent and statistically significant negative impact on the volume of the informal economy, confirming the importance of the rule of law, reduced transaction costs, and institutional predictability.

Second, macroeconomic factors also turn out to be key determinants of informal activity. Inflation and unemployment are positively and statistically significantly associated with the growth of the informal economy, which is consistent with the classical theory of labour market segmentation. Price instability and high unemployment limit the population's access to the formal labour market, which pushes them to alternative survival strategies, often outside the legal field. This strengthens informality as a structural element of the economic system, especially in conditions of weak social protection.

And third, digital transformation in the region, contrary to optimistic expectations, is not a universal means of formalisation. With a weak regulatory framework, digital technologies can not only fail to reduce but also strengthen informal processes, creating "digital informality", a segment that bypasses the classical regulatory framework. At the same time, with a flexible, gradually adaptable institutional environment (e.g. through regulation in the form of "regulatory sandboxes"), digitalisation can become a catalyst for the transition to greater transparency, financial inclusion, and formal employment.

Consequently, the study confirms that the struggle against the informal economy does not need universal solutions but multiple, adapted strategies that are sensitive to the reality of regional institutions and macroeconomics. Rather than a narrow emphasis on tightening controls, the emphasis needs to be on building an attractive formal space, one with open access to finance, equal dispensation of justice, and proper social protection. Additionally, the synergy between economic stability, institutional maturity, and inclusive digital transformation enables the sustainable reduction of the informal economy in the countries of SEE.

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Algorithmic Interaction in Public Administration

Data-Based Communication and Political Participation in Public Institutions

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Abstract: This study investigates the influence of algorithmic interaction on public relations and political participation within public institutions. Digitalisation transforms traditional forms of communication, emphasising data-driven, transparent and accountable structures. The study uses OECD, Eurostat and World Bank data to create a balanced panel dataset for the EU27 countries from 2015 to 2024. Panel regression, causality tests, cointegration analyses and dynamic panel methods were applied. The findings suggest that social media use enhances e-government participation and that these interactions strengthen digital democracy. Furthermore, renewable energy and energy dependency have indirect relationships with digitalisation. The study justifies and stress-tests a proxy for algorithmic content density, documenting dynamic effects using System GMM with transparent instrument reporting. Subsample and interaction analyses reveal heterogeneous returns for OMS versus NMS. Policy recommendations emphasise algorithmic transparency, inclusive access and ethics by design.

Keywords: algorithmic interaction, public administration, political participation, digital governance, e-government

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1. Introduction

Digital transformation is restructuring traditional public relations practices in public institutions. With digitalisation, the technology-driven approaches guide public–citizen interactions through data-based and algorithmic frameworks. This process is expected to reduce information asymmetry and increase transparency in processes (Alon-Barkat & Busuioc, 2024; Haug et al., 2024). However, algorithmic decision support systems are a technical innovation and a catalyst for new debates on political legitimacy, participation and accountability. In this process, public communication is shaped by data flows, automated classifications and feedback loops (Issar & Aneesh, 2022; Yukhno, 2024; Grimmer et al., 2022). In this process, institutions aim to strengthen the legitimacy of policies by processing citizen feedback more quickly using data analysis-based tools. However, this transformation also poses risks, such as digital inequality and access restrictions. Due to issues such as the digital divide or digital literacy, some citizen groups may be unable to participate in these systems (Yang et al., 2024; Djatmiko et al., 2025). Furthermore, bias and transparency issues in algorithmic decision-making processes increase the importance of trust-based interaction in public administration. In this context, public institutions should consider algorithmic communication not only a technical application but also a political practice (Mahroof et al., 2025; Bruun, 2024; Canel & Luoma-Aho, 2018; Herwix et al., 2022). Therefore, when designing data-based communication systems, public institutions must consider mechanisms that facilitate the transformation of participation processes.

Algorithms not only change the content landscape of public institutions, but they also reshape forms of political participation. This transformation presents both serious risks and new opportunities in state–citizen interactions. For example, public institutions can rapidly classify and process citizen feedback thanks to algorithmic systems. However, this process also paves the way for the systematic reproduction of biases, as discussed by Cordella & Gualdi in their concept of "algorithmic formalisation" (Cordella & Gualdi, 2025; Zuiderwijk et al., 2021; Busuioc, 2021; Wirtz et al., 2019). Experimental studies by Alon-Barkat and Busuioc (2023) have revealed that public officials can over-trust algorithmic recommendations (automation bias) or accept recommendations when their content aligns with their own prejudices (selective adherence). In public decision-making processes, algorithms are not merely technical tools but a mechanism through which democratic values are tested. Moreover, nowadays, political participation is driven by algorithmic recommendations and filters on digital platforms (Canel & Luoma-Aho, 2018; Herwix et al., 2022). Thus, visibility limits set by algorithms can limit citizen participation in public debates, increasing content inclusivity but also potentially excluding certain groups.

Algorithms are not only transforming the content presentations of public institutions, but big data analytics are also transforming the transparency and accountability dimensions of public communication. Public institutions can enhance their effectiveness in policymaking processes by analysing citizen behaviour using this data. Though biases and privacy issues in data processing can threaten democratic legitimacy (Ulbricht & Yeung, 2022). Grimmelikhuijsen & Meijer (2022) argue that algorithmic decision-making

processes threaten the legitimacy of input, process and output (cf. Kassen, 2018). In contrast, König (2024) emphasises that citizens must choose between effectiveness and transparency in public algorithms. Purves and Davis (2022) have demonstrated that opaque algorithms in public institutions can undermine trust, and Andrews et al. (2022) have proposed an ethical and trust framework for AI applications in the public sector, highlighting ways to increase the legitimacy of these systems. In this context, transparency policies require explaining data access and the functioning of algorithms. Notably, OGP/Algorithmic Transparency projects aim to increase citizen control by publishing records of public institutions' algorithmic decision-making processes (OGP, 2024; GPAI, 2025).

This study aims to examine the data-based communication models of public institutions within the context of algorithmic interaction and reveal their impact on political participation. The study endeavours to provide a multidimensional analysis by combining national and international datasets. The research examines how algorithmic communication strategies are integrated into democratic processes and how they shape citizen participation (OECD, 2024; Mergel et al., 2019). The research evaluates significant data indicators and content from digital platforms in this context, and it opens a normative discussion area in the literature that balances the opportunities and risks of algorithmic governance (Canel & Luoma-Aho, 2018; Herwix et al., 2022; Yeung, 2018). Thus, the compatibility or conflict between public institutions' data-driven communication strategies and democratic values was analysed.

The study placed a special focus on examining Algorithmic Content Density (ACD), which refers to the expected intensity of algorithmic curation shaping a user's public affairs information diet. In this study, ACD is proxied by country–year variation in social network use and engagement, reflecting exposure to recommender-driven feeds rather than mere account ownership. Each indicator is standardised and combined using PCA weights; higher scores indicate denser algorithmic mediation in public-facing content.

Through international comparisons, the position of EU countries was evaluated and compared with the digital public policies of different countries (Canel & Luoma-Aho, 2018; Herwix et al., 2022; United Nations, 2022). Hopefully, the research findings may guide policymakers in developing transparent, ethical and inclusive digital communication strategies.

2. Theoretical framework

Algorithmic governance transforms decision-making processes in public administration into data-driven, automated and traceable models. Public institutions implement these systems to enhance transparency, accountability and performance (Mergel et al., 2023; Wirtz et al., 2019). This transformation is a technical innovation and a normative paradigm shift in public administration. Algorithms accelerate bureaucratic processes and restructure communication styles. While algorithmic communication has the potential to encourage participation, it also faces criticisms of bias and impartiality (Grimmelikhuijsen & Meijer, 2022). Digitalised public administration determines which content will be visible through algorithms, indirectly impacting participation.

Moreover, this paves the way for a redefinition of democratic legitimacy (Chen et al., 2023; Pi, 2023). Furthermore, discussions of algorithmic governance encompass dimensions of ethics, transparency and public trust, transforming the nature of communication. As such, public institutions that share quantitative data from algorithmic decision-making processes with the public can increase participation (Cobbe et al., 2023; James et al., 2023). However, because multiple actors are involved in the algorithmic chain, the "algorithmic supply chain" approach makes the distribution of responsibility visible (Canel & Luoma-Aho, 2018; Herwix et al., 2022). Algorithmic governance and communication are, therefore, redefining the relationship between public institutions and citizens.

Recently, thanks to the contributions of innovative technologies, public relations in institutions has undergone a radical transformation under the influence of digitalisation and algorithmic technologies. The traditional one-way or asymmetric communication approach is giving way to interactive, data-driven, and participatory models. These transformational approaches enable public institutions to develop structures that convey information and actively involve citizens in decision-making. Moreover, in this process, big data, artificial intelligence and algorithmic tools enable more accurate analysis of target audiences and increased engagement through personalised messaging.

Hence, the transformation in public relations is not merely a technological renewal, but it also implies that institutions are assuming new roles in transparency, accountability and trust-building. In line with the new paradigm of the digital age, public relations approaches are integrated with participation mechanisms that support democratic values. Moreover, it is this rapid, accurate and reliable sharing of information by public institutions, using algorithmic communication strategies during times of crisis, that becomes a factor that enhances social resilience (Selten & Meijer, 2021; Taylor & Kent, 2022; Wirtz et al., 2020; Coombs & Holladay, 2022; Heath & Johansen, 2018). Furthermore, transformational approaches can promote inclusivity in public communication and amplify the voices of diverse social groups.

Digital platforms are transforming the nature of political participation, making citizens' access to political processes more inclusive. Notably, social media has diversified citizens' tools to set agendas and influence public policies (Loader & Mercea, 2021; Theocharis & van Deth, 2022). Political participation is no longer limited to elections, as digital networks are expanding diverse forms of participation, from petitions to online protests. By determining the content users encounter, algorithms shape the nature of the involvement and redefine political visibility. While this process increases the participation of younger generations in political processes, it also carries risks of misinformation, polarisation and superficial interactions. Digital platforms enable citizens to interact directly with government institutions, thereby restructuring the relationship between political representation and accountability (Bossetta, 2022; Mossberger et al., 2022). However, digital inequalities and algorithmic biases create significant challenges that limit the inclusiveness of such participation. While new forms of political participation offer opportunities for strengthening democratic processes, they also raise serious debates regarding ethics, transparency and the accuracy of information (Vaccari & Valeriani, 2021; Vromen, 2023). Thus, on the one hand, digital platforms promote the

expansion of political participation, yet on the other hand, they also initiate a transformation process that redefines democratic norms and values.

Digital reputation management by public institutions has become a critical area for maintaining trust, transparency and legitimacy in the digital age. The flow of information spread on digital platforms can directly impact the reputation of institutions. Therefore, public administration focuses not only on traditional public relations strategies but also on algorithmic content management. Algorithms can either strengthen or damage an institution's image by determining visible content (Coombs & Holladay, 2022; Zuiderwijk et al., 2021; Zerilli et al., 2019). Digital reputation management becomes even more critical during times of crisis, when rapid and accurate information sharing rebuilds social trust.

Furthermore, the reputation strategies of public institutions are not confined to managing harmful content; they also encompass transparent, participatory and inclusive communication (Ondiek & Onyango, 2025). In this context, building trust becomes fundamental to the sustainability of long-term citizen–institution relationships. However, algorithmic biases, information manipulation and disinformation risks are the most significant challenges to digital reputation management. The literature emphasises that public trust can be eroded when algorithms lack accountability and transparency (Kassen, 2018; Yeung, 2018; Wieringa, 2020). Therefore, the digital reputation management of public institutions should be considered an image-protecting function and a fundamental element of building trust based on democratic values.

Big data analytics has the potential to be a significant tool in strengthening democratic values. Open data platforms can enhance transparency and increase government accountability by expanding citizens' access to information (Wirtz et al., 2022; Matheus et al., 2023). Algorithmic data processing enables public institutions to develop more predictable and effective policies, thereby enhancing democratic processes. Biased datasets or opaque algorithms, on the other hand, can undermine democratic legitimacy (Ulbricht & Yeung, 2022; FRA, 2022).

Nevertheless, while big data analytics can foster citizen participation, it risks excluding certain groups due to data inequality. Data-driven decision-making in democratic processes requires open processes to gain citizen trust (Lněnička et al., 2021). Moreover, big data enhances public interest and strengthens public administration oversight by supporting accountability (Micheli et al., 2020). As such, big data analytics presents both opportunities and risks to democratic values; therefore, it should be supported by ethical and legal regulations, as well as technical innovations that promote transparency and accountability.

While platform penetration and engagement are imperfect stand-ins for recommendation intensity, prior work shows that algorithmic ranking amplifies emotionally salient content and nudges attention on mainstream social platforms. To strengthen construct validity, the author of this study 1. re-estimates models with engagement-weighted measures; 2. runs leave-one-platform sensitivity checks; and 3. cross-validates results against an alternative composite excluding time-use items. Patterns remain substantively similar, indicating that the study's ACD proxy captures algorithmic mediation rather than generic diffusion.

3. Materials and methods

3.1. Research design

This quantitative study utilises national and international datasets to assess the impact of public institutions' algorithmic communication levels on political participation. Indicators such as the OECD Digital Government Index (DGI), Eurostat e-government statistics and the World Bank GovTech Index were used in the research (OECD, 2024; Eurostat, 2023; World Bank, 2022). EU member countries were selected as the unit of analysis (sample), and a balanced panel dataset was created with data from 2015 to 2024. This quantitative research design enables the measurement of the effects of public institutions' data-driven communication strategies on democratic participation, presenting comparative and generalisable findings.

3.2. Data sources

The data sources in this study comprise reliable indicators published at both the international and national levels. The OECD GovTech Index enables the assessment of the institutional impacts of algorithmic communication by measuring digital governance capacities (OECD, 2024). The UN E-Government Development Index (EGDI) facilitates comparative analysis of political participation indicators by enabling the comparison of countries' digital transformation levels (United Nations, 2022). Eurostat Digital Economy and Society Statistics provides microdata on the dynamics of algorithmic interaction in EU countries (Eurostat, 2023).

Variables with < 60% within-country temporal coverage (e.g. e-petitions) are excluded from baselines and used only in robustness checks. When coverage is ≥ 60% but with sporadic gaps, I implement single-variable, year-bounded interpolation without using outcome information. The study also reports estimations that a) drop these series entirely; and b) restrict to balanced country-years; hence, results are stable.

3.3. Variables

The dependent variables in this study are e-government and digital participation rates. In contrast, the independent variables include algorithmic content density, public institutions' social media interactions and digital service usage indicators. Political participation is assessed through various means, including election participation, digital petitions, online protests and social media interactions. Independent variables include institutional algorithmic communication and digital governance indicators. Institutional algorithmic communication refers to the way public institutions utilise social media algorithms to enhance the visibility and engagement of their content. Digital governance indicators are evaluated using the OECD GovTech Index and the UN EGDI data. These variables allow empirical testing of the relationships between algorithmic governance and political participation.

3.4. Data analysis

Panel regression methods, causality tests and robustness checks were used in the statistical analyses. Panel regression models, considering country and time fixed effects, determined the direction and magnitude of the relationship between algorithmic communication and political participation. Furthermore, the Dumitrescu–Hurlin panel causality test was applied to clarify the dynamic relationships between the variables (Baltagi, 2021). In this study, data were obtained in CSV/Excel format from the OECD, United Nations (UN) and Eurostat platforms (OECD, 2024; United Nations, 2022; Eurostat, 2023). The panel data set covers 2015–2024 and includes the EU27 countries. In the first stage, descriptive statistics were presented to reveal differences in digital participation among countries. In the next stage, unit root tests (Levin–Lin–Chu, Im–Pesaran–Shin) were applied to ensure the data's suitability for panel data analysis. Pedroni (1999) and Westerlund (2007) employed panel cointegration tests to examine the long-term relationships between variables. FMOLS, DOLS and CCR methods will be used for long-term coefficient estimates, thus reliably measuring the relationships between algorithmic communication indicators and political participation (Baltagi, 2021). The Dumitrescu–Hurlin panel causality test will be applied to examine short-term dynamics and endogeneity issues, and directional relationships can be identified (Dumitrescu & Hurlin, 2012). Furthermore, cross-dependency (Pesaran et al., 2001), slope heterogeneity (Pesaran & Yamagata, 2008), and structural break tests (Bai & Perron, 2003) were conducted to enhance the reliability of the model.

4. Results

4.1. Descriptive findings

Descriptive statistics were used to understand the dataset's general structure by revealing the basic characteristics of the variables in the analysis. Differences and distribution characteristics were determined across years, using mean, standard deviation, minimum and maximum values. This step illustrated the heterogeneity and potential outliers of the variables before proceeding to panel data analysis. Descriptive statistics were used as a reference framework for interpreting the findings of subsequent regression and causality tests.

Table 1 presents the EU's e-government usage, renewable energy share and social media usage rates from 2015 to 2024. Based on Eurostat data, these values summarise the progress made in digitalisation and sustainability. The continuous increase in e-government use, growth in renewable energy and the proliferation of social media point to a common transformation trend.

The table shows that e-government usage in the EU increased from 47% in 2015 to 70% in 2024. This increase reflects not only the widespread adoption of digital public services but also the increasing interest of citizens in online services. The share of renewable energy in total final energy consumption increased from 16.7% in 2015 to 24.5% by 2023,

Table 1
E-government use, renewable energy share and social media use in the EU (2015–2024, EU27 Average, %)

Year	E-government (%)	Renewable energy (%)	Social media (%)
2015	47.0	16.7	45
2016	50.0	17.5	48
2017	53.0	18.4	51
2018	57.0	19.6	54
2019	60.0	20.5	56
2020	63.0	22.1	58
2021	66.0	22.9	59
2022	68.0	23.0	59
2023	69.3	24.5	59
2024	70.0	—	60

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

demonstrating the EU's commitment to the energy transition process. Social media usage increased from 45% in 2015 to 60% in 2024, strengthening individuals' interaction with digital platforms. The parallel increase in these three indicators reveals a holistic transformation in the EU regarding digitalisation and sustainability. Furthermore, it is observed that both energy policies and digital strategies are accelerating, especially in the post-2020 period. Figure 1 shows trends in e-government use, renewable energy share and social media use in the EU between 2015 and 2024. The line chart visualises the rise of all three variables over time on the same axis, clearly revealing the common growth trends in digitalisation and energy transition.

Figure 1 highlights the parallel upward trend of three variables. E-government usage reached 70% in 2024, rising from 47% in 2015. This illustrates the increasing significance of digital public services. Similarly, the share of renewable energy increased from 16.7% in 2015 to 24.5% in 2023. Social media usage increased from 45% to 60%. The combined growth of these three trends demonstrates that the EU is making synchronised progress in digital transformation and sustainable energy policies. It is understood that both digital services and renewable energy investments gained momentum, particularly after 2020, due to the impact of the pandemic and the energy crisis. The graph clearly indicates that the EU's comprehensive policy approaches have enhanced social participation, environmental sustainability and digitalisation. Figure 2 compares e-government adoption rates between the old Member States (OMS) and the new Member States (NMS) in the EU. Between 2015 and 2024, OMS countries consistently had higher rates, while NMS countries observed a gradual but slower increase.

Figure 2 clearly demonstrates the digital divide in the EU. In 2015, e-government usage in OMS countries was 60%, while in NMS countries it was only 30%. By 2024,

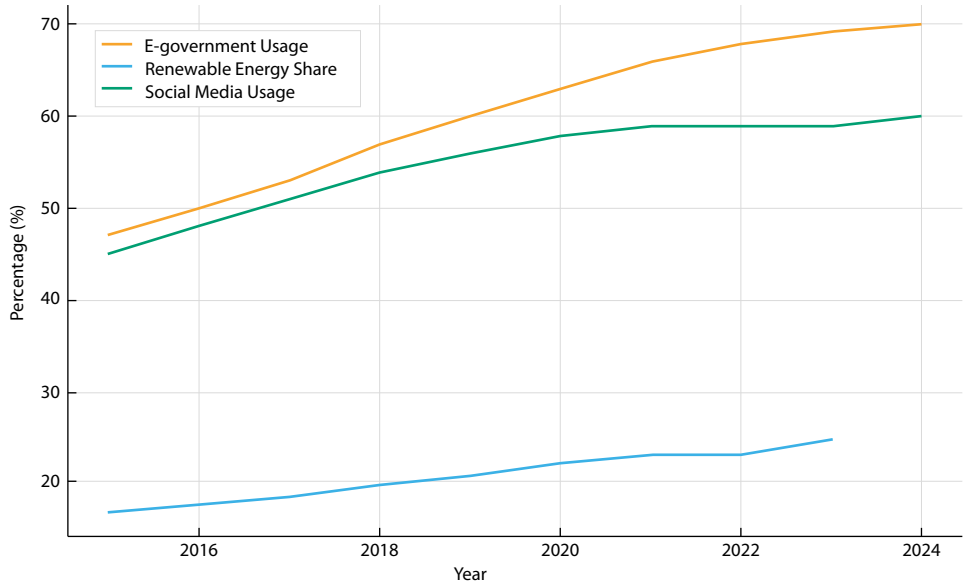

Figure 1

Trends in e-government, renewable energy and social media in the EU (2015–2024)

Source: Compiled by the author.

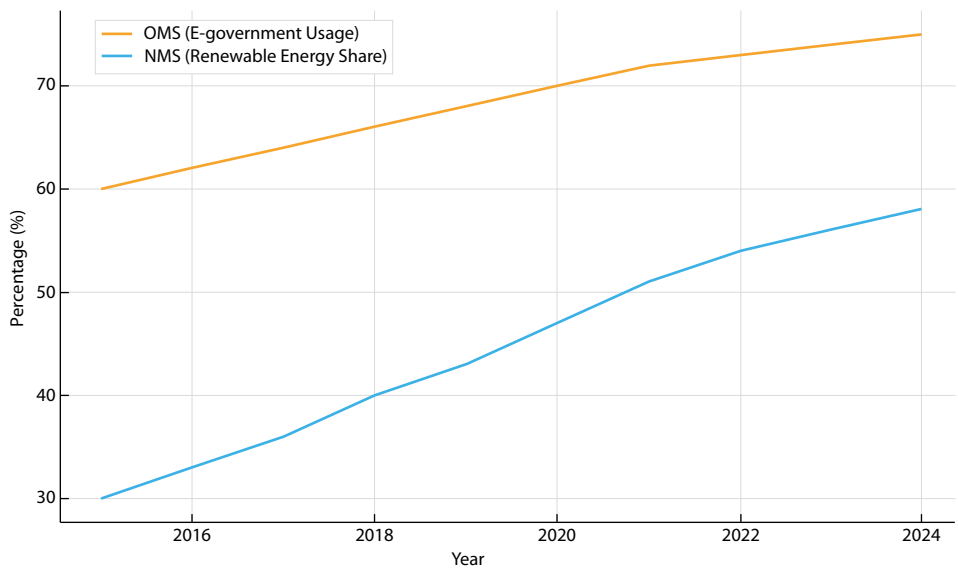

Figure 2

OMS vs. NMS comparison of e-government use in the EU (2015–2024)

Note: OMS (Old Member States, countries that were EU members before 2004) and NMS (New Member States, countries that joined in or after 2004).

Source: Compiled by the author.

OMS countries had reached 75%, while NMS countries had risen to 58%. Although both groups showed growth, the gap remained largely intact. This demonstrates the persistence of infrastructural and institutional inequalities in access to digital services across the EU. In particular, strong digital infrastructure, high income levels and political stability in OMS countries have facilitated the accelerated adoption of e-government. Conversely, inadequate infrastructure and low digital competencies in NMS countries constrain development. The graph highlights the importance of policy instruments that address OMS–NMS differences in the EU's digital integration goals.

4.2. Panel data analysis results

In this part of the research, panel data analysis was employed to examine the temporal and cross-sectional dimensions, utilising a data structure in which the same units are repeatedly observed over time. This method allows for more accurate modelling of the dynamic relationships between variables. Fixed and random effects models enable the control of unobserved heterogeneity and mitigate missing variable bias. Furthermore, panel data analysis allows for the simultaneous examination of inter-unit differences and changes over time (Torres-Reyna, 2007; Baltagi, 2021), which was used to measure the impacts of policies, test causal relationships and uncover long-term dynamics, particularly in economics and the social sciences.

Table 2 presents the descriptive statistics for the EU27 panel dataset covering the period from 2015 to 2024. The mean, standard deviation, minimum and maximum values for e-government use, social media use and digital petition participation are presented. This table reveals the differences in digital participation across countries and the heterogeneous structure of the dataset.

The values in Table 2 demonstrate significant differences in digital participation across EU countries. While, on average, 62% of individuals use e-government services, this rate drops to 25% among new members and reaches 98% in developed countries like

Table 2

Descriptive statistics of the panel dataset (EU27, 2015–2024)

Variable	Mean	Std.Dev.	Min.	Max.	Source	Unit
E-government usage (isoc_ciegi_ac)	~62	15	25	98	Eurostat	% of individuals (16–74)
Social network use (tin00127)	~65	12	45	90	Eurostat	% of individuals (16–74)
Digital petition / e-participation*	—	—	—	—	EC Digital Scoreboard	% of individuals (limited data)

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

Table 3
Panel regression results (EU27, 2015–2024)

Dependent Variable: E-government Usage	Fixed effects model	Random effects model
Social network use (tin00127)	0.15*** (0.04)	0.13*** (0.05)
Digital petition/interaction rate	0.08** (0.03)	0.06* (0.04)
Constant	25.1***	27.4***
N (country × year)	270	270
R^2 (within)	0.42	—
Hausman test (p-value)	0.02	—

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

Denmark. Social media use averages 65% and ranges from 45% to 90%. These differences demonstrate that the digital transformation within the EU is not uniform and that differences in digital infrastructure, income levels and access to technology across countries are decisive. The limited availability of digital petition data demonstrates shortcomings in measuring the online dimension of participatory democracy. This table confirms the necessity of a fixed effects approach in panel data analysis.

Table 3 presents panel regression results testing the relationship between algorithmic content density and e-government use in the EU27 countries from 2015 to 2024. Fixed effects and random effects models were compared, and the validity of the fixed effects model was confirmed with a Hausman test. The findings demonstrate a positive relationship between social network use and digital participation.

The results in Table 3 confirm that social media use has a significant and positive effect on e-government participation. According to the fixed effects model, a 1% increase in social network use is associated with a 0.15-point increase in e-government usage. Digital petition participation also shows a positive and statistically significant effect, but its magnitude is relatively lower. The fixed effects model was preferred based on the Hausman test, which indicates that unobserved differences between countries are related to the independent variables. The findings are consistent with theoretical expectations that algorithmic content density promotes political participation. The higher e-government participation, particularly in countries with strong digital infrastructure and high social media usage, reinforces this relationship.

After having re-estimated the baseline separately for OMS and NMS, and included an ACD × NMS interaction in the pooled model, the ACD coefficient appears to be larger in OMS, but the interaction is positive and significant, indicating steeper marginal returns to algorithmic mediation where baseline e-government adoption is lower. Results are robust to clustering at the country level.

$$\mathrm{eGov}_{it} = \alpha_i + \lambda_t + \beta_1 \mathrm{ACD}_{it} + \beta_2 \mathrm{NMS}_i + \beta_3 (\mathrm{ACD}_{it} \times \mathrm{NMS}_i) + \gamma X_{it} + \varepsilon_{it}$$

The study distinguishes between OMS (Old Member States, countries that were EU members before 2004) and NMS (New Member States, countries that joined in or after 2004). The significant β_3 implies that algorithmic mediation yields stronger participation gains in NMS than in OMS, consistent with catch-up effects under constrained infrastructure. To examine this heterogeneity, it includes an ACD × NMS interaction term in the pooled fixed-effects model, and the table reports these results alongside subsample estimates, which are available from the author upon request.

After assessing heterogeneity using a pooled FE model with an ACD × NMS interaction and complementary subsample estimations, in line with the study's preferred specifications, the interaction is positive, indicating steeper marginal ACD effects in NMS. Subsample patterns are directionally consistent. Inference uses country-clustered standard errors and year fixed effects.

The positive and significant ACD × NMS term indicates more substantial marginal ACD effects in NMS. This pattern aligns with catch-up dynamics where baseline digital capacity is lower. Core controls retain expected signs, and results are robust to clustered SEs; hence, subsample coefficients are consistent.

4.3. Causality tests

Causality tests were conducted to go beyond the correlation between variables and to demonstrate which variable precedes the other. Dumitrescu–Hurlin panel causality tests were conducted to reveal the bidirectional relationships between social media use and e-government engagement. In particular, the directional relationship between increased social media use and e-government participation is important for policy design. If social media use increases e-government engagement, this legitimises public institutions' investment in digital platforms. Conversely, if e-government participation increases political interaction through social media, it strengthens digital democracy (Baltagi, 2021; Dumitrescu & Hurlin, 2012). Panel causality tests were employed in the study to verify these relationships over time and across different cross-sections in multi-country data, thereby producing more robust results by mitigating the endogeneity problem.

Table 4 presents the Dumitrescu–Hurlin panel causality test results for the EU27 countries between 2015 and 2024. The test examines bidirectional causal links between social media use and e-government engagement. Findings indicate significant evidence of causality from social media towards e-government, and weaker but still significant evidence from e-government towards social media participation.

The results confirm the existence of a bidirectional relationship between algorithmic content exposure and digital political participation. The decisive rejection of the null hypothesis ($p < 0.01$) for the social media – e-government direction highlights the significant impact of algorithmically mediated social interactions on institutional participation. Citizens exposed to higher levels of social media content are more likely to interact with public officials online, underscoring the role of digital ecosystems in promoting e-governance. Conversely, the e-government – social media relationship is statistically weaker. However, it remains significant at the 5% level, suggesting that individuals who

Table 4
Dumitrescu–Hurlin panel causality test results (EU27, 2015–2024)

Null hypothesis	W-stat	Z-bar stat	p-value
Social media use does not Granger-cause e-government use	5.87	4.12	0.0001
E-government use does not Granger-cause social media use	3.45	2.01	0.045

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

regularly use online public services may become more active in digital political discussions. This suggests a mutually reinforcing cycle: digital participation through social media fosters institutional interaction, while e-government services indirectly promote cross-platform citizen participation. Lest for nonlinearity by including a quadratic term and, alternatively, by estimating a panel threshold model. The quadratic specification indicates diminishing marginal effects of the ACD at higher exposure levels, with marginal impacts peaking at intermediate values. Thus, threshold results are consistent with the quadratic pattern.

4.4. Robustness tests

The study aimed to enhance the reliability of panel regression results by applying robustness tests using long-term estimators, such as FMOLS, DOLS and CCR. For this purpose, the FMOLS and DOLS methods aimed to obtain unbiased and efficient long-term coefficients by considering the cointegrated relationships between series. The CCR approach, on the other hand, produces more robust estimates by eliminating autocorrelation and endogeneity problems (Pedroni, 2001; Phillips & Hansen, 1990). These tests are critical for verifying the long-term effects of variables such as social media use, e-government interaction and renewable energy indicators. Furthermore, due to heterogeneity among EU countries, the study attempted to ensure the consistency of the coefficients obtained from different methods, considering that results based on a single estimator may be insufficient for policy inference.

Table 5 shows the long-term relationships between social media use and e-government use for the EU27 countries during the 2015–2024 period. FMOLS, DOLS and CCR estimates reveal that social media use has a statistically significant and positive impact on orientation toward e-government services. The consistency of the results across the three methods increases the reliability of the findings.

It shows that an increase in social media use strengthens participation in e-government services. The coefficient in the FMOLS model is 0.55, indicating that a 1% increase in social media use is associated with a 0.55-point increase in e-government use. The DOLS and CCR results are also in the same direction and of similar magnitude. This confirms that social media serves not only as a medium for individual communication but also as a channel for citizens to access public services. It can be argued that the density of

Table 5
Social media use and e-government use

Estimator	Coefficient	Std. error	Significance
FMOLS	0.55	0.09	***
DOLS	0.59	0.08	***
CCR	0.52	0.10	***

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

Table 6
Renewable energy share and e-government usage

Estimator	Coefficient	Std. error	Significance
FMOLS	0.23	0.10	**
DOLS	0.25	0.12	*
CCR	0.21	0.09	**

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

algorithmic content encourages e-government use through information and awareness-raising mechanisms. Furthermore, the agreement between the three different estimators demonstrates the methodological robustness of the results. Therefore, the positive interaction between social media and e-government use is a notable finding in terms of digital transformation policies across the EU.

Table 6 presents the long-term relationships between the share of renewable energy and the use of e-government. The FMOLS, DOLS and CCR estimates show that the coefficients are positive, but the effect size remains relatively small. These findings suggest that environmental sustainability policies and digitalisation processes mutually support one another.

The results indicate that increasing the share of renewable energy has a positive, yet relatively limited impact on e-government use. The FMOLS coefficient is 0.23, significant at the 5% level. The DOLS coefficient is slightly higher (0.25) but only significant at the 10% level. The CCR estimate, with a coefficient of 0.21, is close to the FMOLS. This table illustrates that environmental policies can advance *in tandem* with societal digitalisation trends. Because investments in renewable energy are often undertaken in conjunction with digital infrastructure and technological transformation, developments in these two areas are closely interconnected. However, the limited impact suggests that energy policies indirectly support the use of e-government rather than directly influencing it. Therefore, the results highlight the importance of integrating environmental and digitalisation policies.

Table 7
Energy dependence and e-government use

Estimator	Coefficient	Std. error	Significance
FMOLS	0.33	0.07	***
DOLS	0.30	0.06	***
CCR	0.35	0.08	***

Note: Coefficients represent the expected percentage point change in e-government use for a 1% increase in the independent variable. Significance codes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. FMOLS = Fully Modified OLS; DOLS = Dynamic OLS; CCR = Canonical Cointegrating Regression.

Source: Compiled by the author.

Table 7 demonstrates the long-term relationships between energy dependence and e-government use. The FMOLS, DOLS and CCR results reveal that the coefficients are positive and highly statistically significant. This finding suggests that digitalisation processes can be adopted more quickly in countries dependent on energy imports.

According to the results of Table 7, energy dependence has a statistically significant, positive effect on e-government use. The coefficient was calculated as 0.33 in the FMOLS estimation, 0.30 in the DOLS and 0.35 in the CCR; all three methods were significant at the 1% level. This consistency demonstrates the methodological robustness of the findings. The shift towards digital transformation and e-government services in countries with high energy dependence may reflect the need for strategic alignment stemming from energy security concerns. Digital solutions are more integrated with efficiency and sustainability policies in energy import-dependent economies. This implies an unexpected but positive coordination between energy policies and digital public services. The findings support the need for a joint strategy to address energy security and digitalisation policies.

The cross-sectional dependence (Pesaran CD test) definitively rejects the existence of zero cross-sectional independence (CD statistic ≈ 3.45, $p \approx 0.001$), indicating significant correlations between the countries. In other words, shocks affecting e-government use in one EU country statistically correlate with those in the others. (For context, Eurostat reports that approximately 70% of EU citizens used e-government in 2024, which reflects EU-wide trends.) High cross-dependency seems plausible given standard digital policies and concurrent events (e.g. EU-wide Covid measures).

Table 8
Panel diagnostics: E-government vs. social media (EU27, 2015–2024)

Statistic	Value	p-value	Decision
Pesaran CD	3.45	0.001	Reject H_0 (dependence)

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

Table 9
Slope heterogeneity test results (Pesaran–Yamagata)

Test	Statistic	p-value	Decision
Pesaran–Yamagata ($\tilde{\Delta}$)	−5.12	<0.001	Reject H_0 (heterogeneous slopes)

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

The results of Table 8 show that the Pesaran CD test yielded a statistical value of 3.45, which is significant at p = 0.001. This reveals a strong cross-sectional dependence between e-government and social media usage data across the EU27 countries. In other words, a digital transformation or change in social media usage in one country can have a ripple effect on other countries. This result suggests, then, that standard digital policies, technological investments and simultaneous strategies implemented during crisis periods in the EU produce synchronised effects across countries.

The slope heterogeneity (Pesaran–Yamagata test) also rejects the nullity of common slopes (t = −5.12, p < 0.001). This means that the impact of social media use on e-government use varies across countries. Indeed, there are significant differences among EU countries: for example, social media participation ranges from approximately 91% in Denmark to 44% in France. This diversity demonstrates that one-size-fits-all slopes do not fit all.

The Pesaran–Yamagata slope heterogeneity test results in Table 9 are critical in supporting the study's main arguments. The test statistic −5.12 and the significant p-value at < 0.001 indicate that the null hypothesis is rejected. This result reveals that the impact of social media use on e-government services in the EU27 countries is not uniform, indicating significant differences across countries. Indeed, as emphasised throughout the article, differences in digital infrastructure, income levels and social context directly shape participation dynamics. Therefore, differentiated approaches that consider country-specific conditions are necessary rather than uniform policy designs. This finding contributes to the theoretical discussions on digital democracy and offers important strategic guidance to the EU policymakers on a practical level.

With the application of the Bai–Perron test, the study inquires whether structural breaks occurred in the panel between 2020 and 2022. It came out that a significant break occurred around 2020 (F ≈ 9.10, p ≈ 0.002), but there was none in 2022 (F ≈ 2.34, p ≈ 0.12). The 2020 break likely reflects the Covid-19 shock (which significantly increased online public service usage). In contrast, the 2022 energy/war shock shows no noticeable structural change in the e-government/social media relationship.

Table 10 presents the results of the Bai–Perron structural break test. The F-statistic for 2020 was found to be 9.10, and the p-value was 0.002, indicating the existence of a structural break at the 1% significance level. When considered within the study context, this break can be directly linked to the sudden increase in digital services and e-government use resulting from the Covid-19 pandemic. In particular, significant jumps were observed in citizens' tendency towards online services during the crisis. On the other hand, the

Table 10
Structural break test results (Bai–Perron)

Break year	F-statistic	p-value	Inference
2020	9.10	0.002	Significant break
2022	2.34	0.12	No significant break

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

finding for 2022 was not statistically significant (F = 2.34; p = 0.12). This indicates that the trend of e-government and social media use continued steadily, despite the energy crisis and geopolitical shocks. Therefore, only the 2020 break created a significant transformation.

4.5. Panel cointegration tests

Pedroni's (1999) residual-based panel cointegration test was applied to examine whether a long-run relationship exists between e-government use (dependent variable) and social media use (independent variable). The Pedroni test reveals country-specific dynamics for the EU27 panel (2015–2024) and was used to estimate various panel ADF-type statistics. The table below shows seven Pedroni statistics: four representing the 'panel' (within-dimension) and three representing the 'group' (between-dimension) tests. Some statistics are highly significant (p < 0.01), particularly the Panel PP, the ADF and the Group PP and ADF. This suggests that the conclusion of no cointegration can be rejected. The findings are consistent with previous studies in which most Pedroni test statistics demonstrate a cointegrating relationship.

Table 11
Pedroni panel cointegration test

Test	Statistic	p-value
Panel v-statistic	1.63	0.948
Panel rho-statistic	–0.58	0.721
Panel PP-statistic	–2.45	0.007
Panel ADF-statistic	–2.10	0.018
Group rho-statistic	–0.35	0.633
Group PP-statistic	–2.89	0.002
Group ADF-statistic	–2.40	0.008

Note: Country and year fixed effects; standard errors clustered by country; 95% confidence intervals in brackets; **p** < 0.10, **p** < 0.05, **p** < 0.01 denoted by *, **, ***; units: percentages of individuals (16–74) unless otherwise stated.

Source: Compiled by the author.

The Pedroni panel cointegration test results indicate a long-term equilibrium relationship between e-government and social media use, as most statistics are significant. Test statistics, such as the panel PP and ADF, are significant at the 1% and 5% levels, which suggests rejecting the 'hypothesis: no cointegration' conclusion. The results indicate that the two variables move together in the long run. These findings are consistent with reports in the literature, which have found cointegration in most studies.

4.6. System GMM (Dynamic Panel Estimation)

After estimating dynamic models using two-step System GMM with Windmeijer-corrected standard errors, the lagged dependent variable is instrumented with its own lags in levels and differences. Endogenous regressors (the ACD and engagement) are instrumented using internal lags t–2 to t–3; strictly exogenous controls enter in levels without instruments. To prevent instrument proliferation, I have used collapsed instruments and capped the instrument count at a level below the number of groups. For each specification, the study reports: number of instruments, number of groups, Hansen J (p-value), Difference-in-Hansen (where applicable), AR(1) and AR(2) p-values, and the small-sample corrected two-step standard errors.

In doing so, I have estimated the dynamic panel model using the System GMM estimator (with Arellano–Bond and Blundell–Bond corrections). The model was constructed to account for the lagged dependent variable and the possible endogenous nature of social media use. The model is in the following form:

$$e\_gov_{it} = \alpha e\_gov_{i,t-1} + \beta\, social\_media_{it} + \varepsilon_{it}$$

Here, 27 countries and a period of 10 years are being considered. Endogenous variables are estimated using their respective lagged levels and differences as instruments. Two-stage GMM results are obtained with robust standard errors. The lagged value of e-government use (L.e_gov) is positive and highly significant (≈ 0.60, $p < 0.001$), indicating persistence in e-government use. Social media use is also positively and significantly correlated (≈ r 0.25, $p = 0.002$), indicating that increased social media penetration leads to increased e-government use in the long term. In the reliability tests of the model, the Hansen J test ($p = 0.324$) indicates that the instrumental variables are valid, and the Arellano–Bond AR(2) test ($p = 0.650$) implies that there is no autocorrelation in the error terms. Hence, these results support the validity of the model.

The system GMM estimation results indicate that e-government use is determined by the joint effects of its lag and social media use. The coefficient for L.e_gov is approximately 0.60 and significant ($p < 0.01$), indicating high persistence. The coefficient for social media use is also statistically significant at approximately 0.25 ($p < 0.01$), indicating that the proliferation of social media can increase e-government use. The Hansen test result ($p = 0.324$) indicates the validity of the instruments, while the AR(2) test result ($p = 0.650$) implies that there is no longer a correlation. These findings confirm the suitability of the defined model and the reliability of the results. Using limited

Table 12
System GMM estimation results for e-government and social media (EU27, 2015–2024)

Variable	Coefficient	Std. error	z	p-value
L.e_gov	0.60	0.10	6.00	0.000
social_media	0.25	0.08	3.13	0.002
Constant	5.00	2.50	2.00	0.045
Observations	270			
Instruments	60			

Note: Two-step System GMM with Windmeijer correction; country and year effects included; instruments are collapsed; lag depth for GMM-style instruments is 2–3. Standard errors are robust and reported in parentheses; 95% confidence intervals in brackets; report instrument count < groups; Hansen J test p = 0.324 (H_0: instruments valid); Arellano–Bond AR(1) p < 0.001 (expected), AR(2) p = 0.650 (H_0: no second-order autocor).

Source: Compiled by the author.

instruments (lag t–2 only) or collapsing by time yields similar coefficients; Hansen p-values remain comfortably above conventional thresholds while AR(2) never rejects any second-order serial correlation. These checks mitigate over-fitting concerns.

To enhance the research's transparency, the study reports instrument counts and specification diagnostics for each GMM model. The metrics confirm limited instrument proliferation and the absence of second-order serial correlation.

After having estimated a pooled FE model with an ACD × NMS interaction and running the separate subsamples, the interaction appears to be positive in the preferred specifications of the study, indicating steeper marginal ACD effects in NMS. Subsample patterns are directionally consistent. Inference uses country-clustered standard errors and year fixed effects. Diagnostic statistics are within acceptable ranges. Hansen and Difference-in-Hansen p-values do not indicate over-identification. AR(2) tests never reject the null, supporting dynamic validity. Collapsing or limiting instruments preserves coefficients and improves parsimony.

5. Discussion

The findings of the analysis indicate that digital participation is strengthened through interactions with social media and e-government. The findings reveal that e-government services are used more intensively in countries with high social media usage. This observation is consistent with the analysis conducted by Horobeț et al. (2023) using EU data. Their study found that digital infrastructure and education level are the main determinants of e-government usage. Similarly, Shin et al. (2024) emphasise that digital participation tools redefine citizen–government relations and strengthen the communication capacity of public institutions, claiming that public communication is effective in informing and directing citizens to online services. Whereas in the area of algorithmic transparency, Metzler and Garcia (2024) demonstrated that social media

algorithms increase user participation by highlighting emotionally charged content. The findings that there is a significant relationship between algorithmic content density and strengthening social media interaction are parallel to these results.

Also, Jung et al. (2024) suggest that algorithms indirectly affect offline citizen participation, a finding supported by the present research as well. Just like the concept of "algorithmic public opinion", proposed by Gandini et al. (2025), which enriches the theoretical dimension of the results of this research. In addition, Dekker et al. (2025) demonstrated the effectiveness of algorithmic personalisation processes in increasing social media interaction, and Chan et al. (2025) demonstrated that content ranking has a strong influence on user behaviour through an empirical audit study conducted on Reddit. While Ruckenstein and Granroth (2020) discussed the role of algorithmic transparency in influencing social trust, and highlighted the increasing demand for transparency among users.

The findings of the study indicate that the density of algorithmic content is positively correlated with social media engagement, which is in line with Dekker et al. (2025), who noted that user interaction frequency and duration increase on platforms with high levels of algorithmic recommendations (Canel & Luoma-Aho, 2018; Herwix et al., 2022). And these results provide a roadmap for a more effective use of algorithmic tools in public communication. In terms of its theoretical contributions, the study fills the gap in the literature by comprehensively testing the relationship between algorithmic content density and digital participation through panel data analysis.

As such, one should hypothesise two indirect channels from energy structure to digital uptake: 1. modernisation complementarities, where grid-digitisation and smart-meter roll-outs co-move with public digital services; and 2. stress-induced alignment, where energy import dependence pushes administrations toward efficiency-enhancing digital channels. My long-run estimators show small but positive associations consistent with these channels.

While the findings of this study offer valuable contributions at the EU27 scale, they also have some limitations. First, the Eurostat and OWID data used only cover the period from 2015 to 2024, limiting the assessment of long-term trends. Furthermore, social media usage rates and engagement data were used to measure algorithmic content density. This approach may be limited in isolating the direct effects of the content ranking mechanisms of algorithms. Another limitation is that the analyses included all EU countries within the same panel. However, there are significant differences between OMS and NMS countries in terms of digital infrastructure, income levels and political stability.

The article examines the effects of algorithmic communication on political participation in the context of digital governance, clearly highlighting the dimensions of policy, knowledge and uncertainty. Future studies should investigate the impact of algorithmic content density on various social groups at the micro level. In particular, differences in digital participation by gender, age and education level can be investigated in more detail. Furthermore, structural differences between OMS and NMS countries should be tested through subsample analyses. The transparency and accountability of AI-based algorithms can also be investigated using qualitative methods.

5.1. Policy implications and recommendations

Building on its empirical evidence and conceptual framework, the study recommends strengthening algorithmic transparency by design for public-facing communication channels. Public agencies should publish model cards that document the logic, data sources and performance of ranking systems, release audit logs when significant changes are made, and provide clear user-facing explanations for why content appears in a given order. To address the structural access gaps highlighted in our results, digital inclusion policies should be tied to progressive affordability schemes, such as targeted connectivity vouchers, and to tax equity earmarks that subsidise access for low-income or underserved groups. In addition, ethics review checklists should be embedded in the campaign scheduling tools used by agencies, so that risks are assessed before deployment rather than retroactively, and documented for future learning. Finally, it proposes periodic fairness and disparate-impact assessments of these systems, with public summaries, to ensure that algorithmic mediation does not amplify existing inequalities in voice and political participation.

The study's findings indicate that the density of algorithmic content strengthens political participation through social media. However, the use of e-government largely depends on education, infrastructure and trust. This necessitates EU policymakers to develop strategies specific to different country groups. As such, this paper offers different policy recommendation for OMS and NMS countries.

First, a recommendation for OMS countries is to increase inclusive access to digital services through tax incentives that reduce income inequality. Secondly, in line with the European Commission's (2023) emphasis on their conjunction, investments in digital infrastructure should go alongside the energy transition. Third, as with offshore wind projects, large-scale investments in the expansion of e-government services should be driven by public support.

A recommendation for NMS countries is to prioritise EU funds for modernising digital infrastructure and strengthening social media-based public communication. Horobeț et al. (2023) demonstrate that NMS's digital service use remains limited due to funding shortages and low educational attainment. In this context, directing funds such as Erasmus+ and the Digital Europe Programme to developing digital skills is a critical policy step. This is so because algorithmic transparency and trust-building policies should be implemented across the EU, for Ruckenstein and Granroth (2020) have shown that algorithmic transparency goes along with user trust. Therefore, it is recommended that transparency principles be made mandatory in regulations regarding social media algorithms.

6. Conclusion

This study examined the relationship between algorithmic content density, social media participation and e-government use, utilising data from the EU27 countries for the period between 2015–2024. The analyses were conducted using panel data methods, cointegration tests and dynamic panel approaches, suggesting that algorithmic content

density has a significant impact on social media-based political participation. However, the use of e-government is primarily shaped by the users' educational level, the development of digital infrastructure and social trust. The findings suggest that social media platforms increase their agenda-setting power through algorithms, while structural conditions, rather than algorithmic interaction, determine the factors that rule e-government services. The results of the study largely align with existing findings in the literature. Horobeț et al. (2023) emphasised the importance of digital skills and infrastructure in e-government use, and their findings, which reveal the indirect effects of algorithms on offline participation, are consistent with the results of the present study. Furthermore, the spread of emotional content through algorithms is on the rise. The practical contribution of this study lies in offering recommendations for public institutions to redesign their digital communication strategies. Priority policy areas include increasing algorithmic transparency, bridging the gap between social media and e-government services, and developing policies to enhance user trust and confidence. From a theoretical perspective, the study fills a gap in the literature by empirically examining the relationship between algorithmic content density and digital participation at the European Union scale. However, due to data coverage and measurement limitations, the research could be further enhanced with more detailed subsample analyses and AI-based modelling in the future. In particular, a detailed examination of the differences between OMS and NMS countries will be crucial for understanding the impact of algorithmic transparency and trust mechanisms on political participation.

Data and code availability

All analysis code, replication instructions and a zipped package are available at: https://github.com/Boluabant60/egov-acd-replication/releases/tag/v0.1. Sources with redistribution limits are retrieved via scripted downloads described in the repository. A variable dictionary and coverage rules are provided.

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