

Research Article**Determinants of Sustainable Public Procurement with Probity Audit as a Mediator****Sopian:** Pancasila University, Jakarta, **Indonesia**; E-mail: sopian5121011@univpanasila.ac.id**Syahril Djaddang:** Pancasila University, Jakarta, **Indonesia**; E-mail: Syahril.Djaddang@univpancasila.ac.id**Dwi Prasetyo:** Pancasila University, Jakarta, **Indonesia**; E-mail: Dwi.prasetyo@univpancasila.ac.id**Haryono Umar:** Perbanas Institute, Jakarta, **Indonesia**; E-mail: Haryono.umar@perbanas.ac.id

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Abstract: Public procurement of goods and services that prioritizes the principle of responsible consumption is part of the implementation of sustainable development and can contribute to national economic growth. Achieving this goal requires effective internal controls in the government procurement process. This study aims to examine the influence of the effectiveness of internal controls, the independence and competence of the Internal Audit Institution (APIP), management support, and the role of external auditors on sustainable public goods and services procurement, with probity audit as the mediating variable and the electronic goods and services procurement system as well as integrity-based financial reporting as control variables. The study employs a quantitative approach using Covariance-Based Structural Equation Modeling (CB-SEM). The results indicate that the role of external auditors, probity audits, and the electronic goods and services procurement system have a significant direct effect on sustainable public goods and services procurement. The effectiveness of internal controls and the role of external auditors also have a significant effect on probity audits and, indirectly, on sustainable procurement through probity audits. Conversely, the independence of the Internal Audit Institution (APIP), the competence of APIP, and management support do not have a significant effect through this mediating mechanism. This study supports institutional theory, contingency theory, and the Three Lines Model, and emphasizes the importance of APIP independence and competency enhancement without leadership intervention in the performance of oversight functions.

Keywords: Public Goods/Services Procurement; Sustainable Procurement; Internal Control; Probity Audit; APIP.**1. Introduction**

Sustainability in the business sector has grown significantly following the 1987 Brundtland Commission Report and the 1992 Earth Summit. These developments reflect a paradigm shift from sustainability which was initially viewed as a voluntary initiative to a strategic necessity for development. Sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Gunawan et al., 2023 ; Giri & Chapparo, 2023). This paradigm no longer emphasizes economic growth alone, but also a balance between profit, competitive advantage, and environmental sustainability (Waas et al., 2014 ; Seefried, 2015).

In the public sector, sustainability is becoming increasingly relevant because the government is one of the largest consumers of goods and services in the economy. Policies that provide greater opportunities to suppliers using domestically produced goods are expected to promote national economic equity (LKPP, 2021). Prioritizing the use of domestically produced goods in government procurement also has the potential to contribute to sustainable economic growth (Oladede, Mah, & Mongale, 2017). In fact, government spending on goods and services makes a significant contribution to Indonesia's economic indicators (Azwar, 2016). Thus, government procurement not only serves to meet organizational needs but also functions as an instrument of economic policy and national development.

The government prioritizes sustainable procurement of goods and services to promote responsible production and consumption patterns. Sustainable procurement is aimed at generating economic benefits for the public while minimizing negative environmental impacts (Presidential Regulation No. 12 of 2021). However, its implementation still faces challenges, particularly in strengthening procurement organizations, regulations, and professional human resources (LKPP, 2023). The quality of procurement is also influenced by the independence of the process and the competence of human resources. The success of e-procurement requires leadership commitment, planning, management systems, regulations, integrated information systems, standardization, and adequate technological infrastructure (Nurmandi & Kim, 2015).

Another issue is the potential for irregularities and fraud in public procurement. The public sector requires internal controls to strengthen accountability in decision-making (Jau and Liu, 2018), while the effectiveness of internal controls plays a role in ensuring that the procurement process aligns with the organization's objectives (Ou, Lydia, and Liu, 2011). The interaction between procurement and the internal audit function can also improve efficiency and risk control (Baltos, Doni, & Balodis, 2018). However, the risk of procurement abuse remains high in ministries/agencies and local governments (KPK, 2022), a finding reinforced by the BPK's audit findings regarding government goods and services procurement (BPK, 2024).

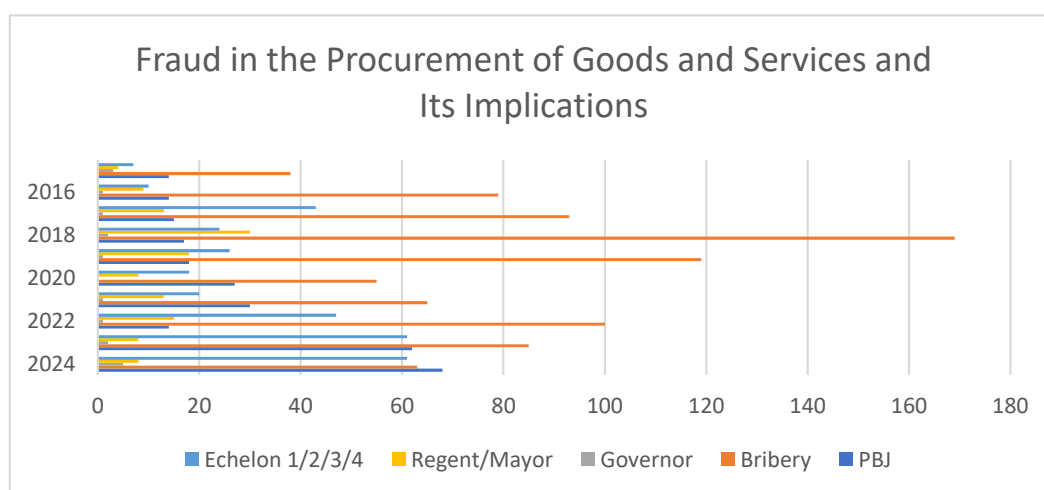


Table 1. Data on Fraud in Government Procurement of Goods and Services

Source: <https://www.kpk.go.id/id/publikasi-data/statistik/penindakan-2>

Based on Table 1, the trend in procurement fraud cases indicates that the public procurement sector still faces risks of irregularities that require serious attention. This phenomenon indicates that oversight is not sufficient if conducted only after the procurement process is complete; rather, it must be carried out preventively and throughout the procurement stages. This situation underscores the importance of effective internal controls and the implementation of probity audits as oversight mechanisms to identify and prevent potential irregularities from the earliest stages of the procurement process.

Under these circumstances, probity audits serve as a relevant oversight mechanism because they are conducted throughout the procurement process. Probity audits are designed to safeguard the procurement objective of obtaining goods and services at the best price and quality (Ng & Ryan, 2001) and have been implemented in several countries, including Australia (Ryan & Ng, 2002). Its implementation can improve transparency and efficiency (Kalb et al., 2012 ; Bawole & Ibrahim, 2017), as well as help prevent procurement fraud (Syamsuddin et al., 2023 ; Arifin & Hartadi, 2020). Its

effectiveness requires competent human resources, information technology, and an adequate budget (Ramadhan & Arifin, 2019).

In addition to oversight, electronic procurement serves as a key tool for enhancing the efficiency and transparency of government spending. This system can improve efficiency, prevent irregularities, and support sustainable procurement (Abas Azmi & Abdul Rahman, 2015; Walker & Brammer, 2009a), although its success requires management support, competent human resources, and technological infrastructure (Vaidya & Campbell, 2016). This study also uses integrity reporting as a control variable because integrity reporting can provide credible information, strengthen accountability, and support good governance (ICAEW, 2011 ; Okpala, 2012).

Based on a review by Karikari Appiah et al. (2022), this study develops a model that positions probity audit as a mediating variable. The novelty of this research lies in testing probity audit as a mechanism that explains the relationship between controls and oversight and sustainable public procurement of goods and services. Previous studies have mostly treated probity audit as a compliance instrument or an independent variable to prevent irregularities (Ng & Ryan, 2001 ; Ryan & Ng, 2002 ; Detkova et al., 2018). Thus, this study seeks to explain how the effectiveness of internal controls and the role of oversight actors can be translated into sustainable public procurement practices through the mechanism of probity audits.

2. Literature Review

Institutional Theory

Institutional theory explains that organizations adapt their structures, policies, and practices to pressures from the institutional environment through coercive, mimetic, and normative mechanisms (DiMaggio & Powell, 2000). In government procurement of goods and services, coercive mechanisms are primarily reflected in the obligation to comply with government-established procurement regulations and procedures. Meanwhile, mimetic mechanisms encourage organizations to adopt practices deemed successful through benchmarking or learning from other organizations, while normative mechanisms develop through professional standards and accepted work practices within the procurement environment (Loosemore et al., 2021 ; Grob & Benn, 2014). This perspective provides a basis for the idea that compliance, professionalization, and sustainable procurement practices are shaped by institutional pressures.

Contingency Theory

Contingency theory holds that the effectiveness of an organizational mechanism depends on the fit between the approach used and the conditions faced. Fiedler (2006) asserts that an approach that is effective in one situation does not necessarily yield the same effectiveness under different conditions. In the oversight of goods and services procurement, the contingency perspective suggests that control mechanisms must take into account the complexity of procurement, the level of risk, organizational characteristics, human resource competencies, and support from relevant parties. Karikari Appiah et al. (2022), indicate that the effectiveness of internal audits requires the involvement of external auditors and management support. Thus, probity audits can be understood as oversight mechanisms whose implementation is tailored to the characteristics and risks of procurement.

Three Lines Model

The Three Lines Model explains the division of roles in an organization's risk management and controls, which includes operational management, the risk and compliance function, and internal audit (IIA, 2020). The first line is responsible for managing risks in operational activities; the second line monitors risks and compliance; while the third line provides independent assurance regarding the

effectiveness of governance, risk management, and controls (Tawfik et al., 2023 ; Vousinas, 2021). In government procurement, the APIP, as an internal oversight function, can conduct probity audits to provide assurance during the planning, implementation, monitoring, handover, payment, and maintenance processes. This perspective positions probity audits as a bridging mechanism between risk management and internal controls.

Effectiveness of Internal Controls

Internal control is a process designed and influenced by management and all human resources to provide reasonable assurance regarding the achievement of operational effectiveness and efficiency, the reliability of reporting, and compliance with regulations (Moeller, 2011). Its effectiveness is influenced, among other factors, by auditor competence, the quality of internal audits, management support, the control environment, and the relationship between auditors and management (Barišić & Tušek, 2016 ; Pooe et al., 2022b). In the context of government procurement, internal control serves as a crucial tool for identifying, preventing, and mitigating the risk of irregularities.

APIP Competencies

APIP competencies encompass the knowledge, expertise, skills, education, experience, training, and attitudes required to perform oversight functions professionally (Markowitsch & Plaimauer, 2009 ; Salman et al., 2020). Competencies include not only hard competencies but also soft competencies, such as communication skills and professional conduct. Education, practice-based training, experience, and continuous professional development are necessary to enhance auditors' ability to perform their duties (Baharud-din et al., 2014 ; Bautista-Mesa et al., 2018).

APIP Independence

Independence is an attitude of objectivity, honesty, autonomy, and freedom from pressure from other parties in carrying out audit functions. Independence serves as the foundation for the effectiveness of internal audit because it enables auditors to maintain the objectivity and credibility of audit findings (Al-Akra et ; Holland & Lane, 2012). Independence can be reflected through objectivity, a legal basis, as well as policies and procedures that support the professional performance of audit functions (Karikari Appiah et al., 2022).

The Role of the External Auditor

External auditors play a role in strengthening accountability, compliance, and governance through audits of the management of public resources (Cordery & Hay, 2019). In the public sector, external audits include compliance audits and performance audits to provide assurance regarding the accountability of public funds. Coordination between internal and external auditors can broaden the scope of audits, reduce duplication of work, and improve audit quality (Behrend & Eulerich, 2019 ; Alzeban & Gwilliam, 2014). Such synergy is relevant in strengthening oversight of government procurement processes for goods and services.

Management Support

Management support includes the provision of human resources, budgets, information technology, education, training, and facilities necessary to carry out internal audit functions effectively (Tackie, Marfo-iyadom, & Achina, 2016). This support enables auditors to enhance their competencies and carry out oversight activities more effectively (Savčuk, 2007). In the procurement of goods and services, management support is also part of the organizational conditions that enable effective interaction between internal and external auditors and effective risk management (Anin, Essuman, Asare-Baffour, Manu, & Asamany, 2022).

Probity Audit

A probity audit is an independent oversight process aimed at ensuring that every stage of procurement is carried out consistently, honestly, transparently, and in accordance with applicable regulations (Bernardi & Hilton, 2023 ; Shead, 2008). Oversight during the planning and implementation processes allows deviations to be identified and prevented at an earlier stage (Ng & Ryan, 2001 ; Syamsuddin et al., 2023). The implementation of real-time probity audits can also support transparency, efficiency, and procurement governance (Bawole & Ibrahim, 2017 ; Kalb et al., 2012). Therefore, probity audits are relevant as a preventive mechanism in government goods and services procurement.

Electronic Goods and Services Procurement System

Electronic procurement is the use of internet-based information and communication technology in the implementation of government goods and services procurement stages (Croom & Brandon-Jones, 2007). This system can improve market efficiency and reduce costs, as well as minimize opportunities for direct interactions that could potentially lead to irregularities. Its implementation requires the integration of information systems, technological infrastructure, project management, and management support (Vaidya & Campbell, 2016). A study also shows that e-procurement can help mitigate irregularities, while Walker & Brammer, (2009b), link it to sustainable procurement.

Financial Statement Integrity.

The integrity of financial statements relates to the reliability, transparency, and credibility of the information used in decision-making (ICAEW, 2011). Integrity can be reflected through compliance with accounting standards and the application of the principle of conservatism (Nurullah, Khamisah, & Kesuma, 2022). Governance, audit committees, internal audits, and external audits also play a role in strengthening reporting integrity (Okpala, 2012 ; Shbeilat, 2018). In the context of this study, the integrity of financial statements is used as a control variable because the quality of financial information can support accountability and governance in government procurement of goods and services.

Sustainable Public Goods and Services Procurement.

Public procurement is the process by which the government acquires goods or services from external providers to support the activities of public organizations (Walker & Brammer, 2019 ; Lăzăroiu et al., 2020). Sustainable Public Procurement integrates economic, social, and environmental aspects into procurement decisions (E.Commission, 2020). Its implementation involves attention to cost efficiency, the use of domestic products, environmental protection, human resource competence, management support, and information technology. These various factors are necessary to ensure that procurement not only meets government needs but also delivers value for money and sustainable benefits for society.

3. Conceptual Framework Of Research

The scale for measuring the effectiveness of internal controls is adopted from Turetken et al. (2020), Getie Mihret & Wondim Yismaw (2007) , Getie Mihret & Zemenu Woldeyohannis (2008) , Al-Twaijry et al. (2003) , Ahmad et al. (2009). Measurements of probity audit refer to Ryan & Ng (2002), Sustainable Public Procurement (SPP) at Meehan & Bryde (2011) , electronic public procurement at Abas Azmi & Abdul Rahman (2015), and integrity in financial reporting at Krambia-Kapardis et al. (2016) and (Saha, 2022).

The effectiveness of internal controls supports the optimization of procurement processes, compliance with regulations, and the reduction of risks, fraud, and waste (Karikari Appiah et al., 2022). These functions also provide independent and objective assurance and strengthen risk management, controls, and organizational governance (Gormly, 2014 ; Grandia et al., 2015 ; Jermisittiparsert et al.,

2019 ; Murungi et al., 2019). Based on this reasoning, H1 is proposed: that the effectiveness of internal controls has a positive effect on SPP; H2: that it has a positive effect on probity audit; and H12: that it has a positive effect on SPP through probity audit.

The role of external auditors is necessary to ensure accountability in the use of public funds and to strengthen coordination with internal auditors. Such cooperation supports audit coverage, risk identification, reduction of work duplication, and audit efficiency (A. M. Ali et al., 2010 ; Colbert, 2002 ; Said Suwaidan & Qasim, 2010). The relationship between internal and external auditors is also important in providing benefits to the organization and stakeholders (Alzeban & Gwilliam, 2014 ; Munro & Stewart, 2011). Therefore, H3 tests the positive influence of external auditors on SPP, H4 on audit probity, and H13 on the influence of external auditors on SPP through audit probity.

The independence of the Internal Audit Institution (APIP) is a crucial element in the effectiveness of internal audits because it enables auditors to act objectively, professionally, and free from undue pressure (Al-Akra et al., 2016 ; Baharud-din et al., 2014). Access to documents, data, and information supports the conduct of independent oversight (Al-Twajiry et al., 2003). Auditor objectivity is reflected in decision-making based on analyzed evidence (Onza et al., 2015 ; Nurdiono & Gamayuni, 2018). Thus, H5, H6, and H14 test the effect of APIP independence on SPP, audit probity, and SPP through audit probity.

APIP competencies include the education, professional qualifications, training, experience, and skills necessary to conduct audits effectively (Bailey, 2010 ; Tackie et al., 2016 ; Ahmad et al., 2009). Competence also contributes to organizational performance (Getie Mihret & Zemenu Woldeyohannis, 2008 ; O. A. Ali & Owais, 2012). Based on this, H7, H8, and H15 test the effect of APIP competence on SPP, audit probity, and SPP through audit probity.

Management support provides resources, funding, training, certification, and conditions that enable auditors to carry out their responsibilities effectively (Tackie et al., 2016 ; Alzeban & Sawan, 2013). Such support can also strengthen auditors' independence and objectivity by minimizing interference with control processes (Endaya & Hanefah, 2016). Therefore, H9, H10, and H16 test the effect of management support on SPP, probity audit, and SPP through probity audit.

Audit probity is used to strengthen transparency and accountability in the use of public funds and to ensure that the procurement process complies with procedures. Oversight from the planning stage through implementation to handover can help minimize irregularities and enhance accountability (Ryan & Ng, 2002 ; Cordery & Hay, 2019 ; Mattei et al., 2021; Syamsuddin et al., 2023). Consequently, H11 examines the positive effect of probity audits on SPP.

Meanwhile, electronic public procurement supports transparency, accountability, competition, efficiency, monitoring, auditing, and real-time access to information (Gardenal, 2013 ; Abas Azmi & Abdul Rahman, 2015 ; Croom & Brandon-Jones, 2007 ; Svidronova & Mikus, 2015). The integrity of financial reporting is also related to corporate governance, audit committees, and coordination between internal and external audits in preventing fraud and strengthening accountability (Okpala, 2012 ; Mertzanis et al., 2024 ; Shbeilat, 2018).

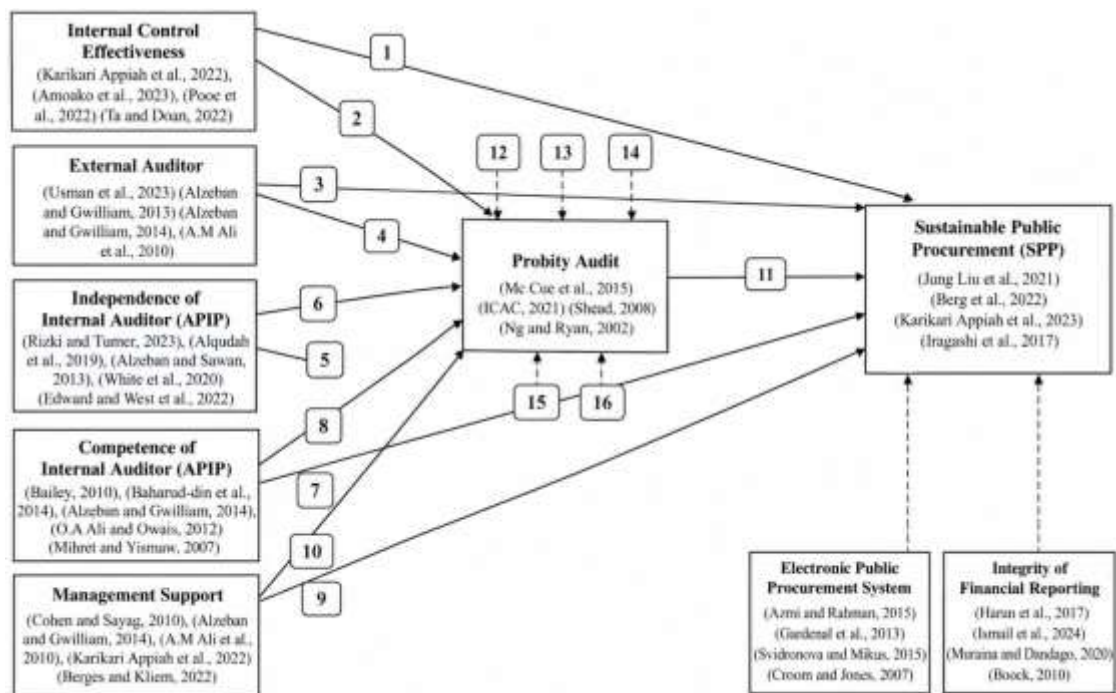


Figure 2. Research Framework

4. RESEARCH METHOD

This study employs a quantitative approach with a survey design to test the relationships among variables based on the developed theory. The quantitative approach is used to objectively identify relationships and influences among variables and to empirically test the theory (Cresswell, 2014 ; Setiadi et al., 2025). The survey was conducted by collecting data via a questionnaire from a sample representative of the population, so that the research results can be used to describe the characteristics and relationships among the research variables (Groves et al., 2009 ; Sugiyono, 2019). The study population consists of Government Internal Oversight Agencies (APIP) at the Ministry of Finance, the Financial and Development Supervision Agency (BPKP), the Ministry of Public Works and Public Housing (PUPR), the Ministry of Manpower, and local governments. The sample was selected using purposive sampling, with the criteria that APIP members must have a minimum of two years of service, hold at least the position of First Auditor, and have audit experience. Based on 44 research indicators, the required sample size ranged from 220 to 440 respondents. Research data were obtained from 337 APIP members who met the criteria and could be analyzed empirically.

The operationalization of variables was carried out by translating research concepts into dimensions and indicators that can be empirically measured (Sekaran & Bougie, 2009 ; Sugiyono, 2019). The research variables include the effectiveness of internal control, APIP competence, APIP independence, external auditors, management support, audit probity, sustainable procurement of goods and services, the electronic procurement system, and the integrity of financial reporting. Each construct is measured using a number of indicators relevant to theoretical concepts and previous research, employing an interval scale. The research instrument consists of a questionnaire developed based on the constructs and indicators from previous studies. The questionnaire is designed to collect data on the relationship between internal control, audit probity, and sustainable procurement of goods and services. Measurements used a Likert scale to capture respondents' attitudes, perceptions, and evaluations of each indicator (Sugiyono, 2019). Analysis employed Covariance-Based Structural Equation Modeling

(CB-SEM) to test causal relationships, mediation, and model fit based on the developed theory. Electronic procurement systems and financial reporting integrity were used as control variables.

Data collection was conducted in coordination with APIP leaders at ministries/agencies and local governments. Requests for participation were formally submitted through the relevant institutions, while the distribution of questionnaires to local government APIPs was facilitated by the KPK's Coordination and Supervision Team for Corruption Prevention. The questionnaire was first pilot-tested with peers to ensure clarity of wording and technical aspects. Data collection took place from January to March 2025 using Google Forms and yielded 337 APIP respondents who met the minimum sample requirements. The study participants consisted of 337 APIP members from ministries/agencies and local governments. Respondent characteristics included gender, age, education level, job rank, and length of service. The respondent composition consisted of 70% men and 30% women. By age, the majority were in the 41–50 age range, accounting for 36%. Educational attainment was dominated by Bachelor's/Diploma IV degrees at 52.6% and Master's degrees at 45.7%. By years of service, the 3–5 year group constituted the largest proportion, at 47.8%.

Data analysis was conducted using descriptive statistics and structural equation modeling. Descriptive statistics were used to describe respondent characteristics and data distribution. Instrument validation included convergent validity, discriminant validity, composite reliability, and Cronbach's alpha. Model evaluation included the coefficient of determination, effect size, predictive relevance, and goodness of fit. Hypothesis testing was conducted to identify the relationships among variables, including the mediating role of audit probity. The analysis was performed using a SEM approach to test the theoretical model developed by (Setiadi, 2026).

5. Results and Discussion

Research Results

Research data were collected via a questionnaire and analyzed using SmartPLS 4.0. The analysis included an evaluation of the measurement and structural models through validity and reliability tests, as well as an examination of the relationships among variables. After eliminating indicators and outliers, all constructs met the measurement criteria and were subsequently used in the structural model testing.

Validity Tests

Validity testing was conducted using outer loadings and Average Variance Extracted (AVE). In the initial stage, most indicators had outer loadings above 0.40, but some remained below 0.60. After evaluation and the removal of data categorized as outliers, the results of the second stage showed that most indicators had outer loadings above 0.60. The AVE values for all constructs in the second stage were also above 0.50, namely Competence 0.598, Independence 0.509, Management 0.535, External Auditor 0.673, APIP Effectiveness 0.644, SPBE 0.572, Integrity Reporting 0.778, Audit Probity 0.640, and Sustainable PBJ 0.690 (See Table 1)

Table 1. Outer Loading Values and AVE for Stages 1 and 2

No	Variable	Indicator	Outer Loading 1	AVE 1	Outer Loading 2	AVE 2	Notes After
1	Competency	Competency 1	0.81763	0.5694	0.83186	0.59765	Valid
		Competency 2	0.80995		0.82092		Valid
		Competency 3	0.81058		0.82158		Valid
		Competency 4	0.72801		0.77522		Valid
		Competency 5	0.57913		0.58854		Needs evaluation

2	Independence	Independence1	0.72307	0.4479	0.77475	0.50926	Valid
		Independence2	0.62642		0.65364		Needs evaluation
		Independence3	0.57078		0.60736		Needs evaluation
		Independence4	0.61805		0.64871		Needs evaluation
		Independence 5	0.78530		0.85387		Valid
3	Management Support	Management1	0.78898	0.5381	0.77906	0.53524	Valid
		Management2	0.45369		0.47720		Needs evaluation
		Management 3	0.76245		0.75264		Valid
		Management4	0.80152		0.80654		Valid
		Management5	0.79916		0.79028		Valid
4	External Auditor	External Auditor 1	0.84273	0.6625	0.86359	0.67301	Valid
		External Auditor 2	0.84971		0.85126		Valid
		External Auditor 3	0.84551		0.84810		Valid
		External Auditor 4	0.73665		0.73036		Valid
		External Auditor 5	0.78913		0.80118		Valid
5	Effectiveness of APIP/PIP	APIP/PIP Effectiveness 1	0.78272	0.5878	0.79119	0.64398	Valid
		APIP/PIP2 Effectiveness	0.78684		0.81639		Valid
		Effectiveness of APIP/PIP3	0.73159		0.80217		Valid
		Effectiveness of APIP/PIP4	0.81748		0.84688		Valid
		Effectiveness of APIP/PIP5	0.70992		0.75283		Valid
6	SPBE	SPBE1	0.58537	0.5634	0.60027	0.57150	Needs evaluation
		SPBE2	0.70370		0.70146		Valid
		SPBE3	0.88694		0.87931		Valid
		SPBE4	0.68801		0.71116		Valid
		SPBE5	0.84817		0.85217		Valid
7	Integrity Reporting	Reporting1	0.86433	0.7726	0.88563	0.77780	Valid
		Reporting2	0.82270		0.93859		Valid
		Reporting3	0.92462		0.91847		Valid
		Reporting4	0.93497		0.93021		Valid
		Reporting5	0.70656		0.71748		Valid
8	Probity Audit	Probity Audit 1	0.76211	0.5951	0.78438	0.64012	Valid
		Probity Audit 2	0.87680		0.89889		Valid
		Probity Audit 3	0.77446		0.80032		Valid
		Probity Audit 4	0.78255		0.83235		Valid
		Probity Audit 5	0.64341		0.66633		Needs evaluation
9	Sustainable Public Procurement	PBJ1	0.82270	0.7405	0.78984	0.69019	Valid
		PBJ2	0.83711		0.81891		Valid
		PBJ3	0.85265		0.81748		Valid
		PBJ4	0.89821		0.86996		Valid
		PBJ5	0.87027		0.83931		Valid
		PBJ6	0.87985		0.84682		Valid

Source: compiled by the researcher

Reliability Test

Based on Table 2, the post-analysis data show that all constructs have a Composite Reliability > 0.70 and a Cronbach's Alpha > 0.70; thus, in terms of internal reliability, all constructs meet the criteria used in the evaluation of the measurement model. One aspect that requires special attention is the Probity Audit, as its HTMT value is 0.92907. If a conservative threshold of 0.90 is used, this value indicates that the discriminant validity of the Probity Audit construct still needs to be further examined. Meanwhile, the other constructs listed have HTMT values below 0.90.

Table 2. Reliability Tests for Stage 1 and Stage 2

No	Variable	CR Stage 1	CA Stage 1	HTMT Stage 1	CR Phase 2	CA Phase 2	HTMT Phase 2
1	Competency	0.8585	0.87287	0.7864	0.87195	0.87505	0.80909
2	Independence	0.7850	0.83917	0.8793	0.82361	0.83805	0.87121
3	Management Support	0.8074	0.83878	0.8906	0.80596	0.84068	0.88458
4	External Auditor	0.9002	0.90889	0.6281	0.90389	0.91151	0.61497
5	APIP/PIP Effectiveness	0.8747	0.89023	—	0.90019	0.89916	—
6	SPBE	0.8635	0.85859	0.7456	0.86645	0.86366	0.74971
7	Integrity Reporting	0.9451	0.94204	0.7961	0.94559	0.94382	0.80461
8	Probity Audit	0.8741	0.89047	0.9400	0.89456	0.89283	0.92907
9	Sustainable PBJ	0.9452	0.94784	0.6862	0.93056	0.94459	0.68927

Source: compiled by the researcher

The results of the factor outer loading test, presented graphically and in tabular form, can be described as follows:

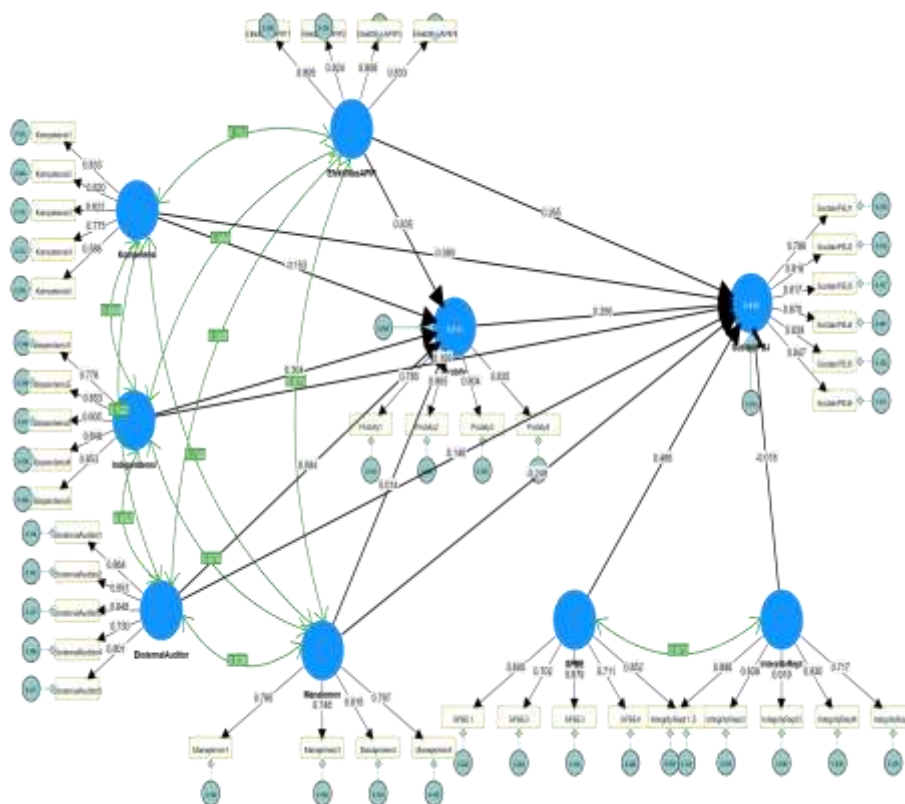


Figure 3. Data Analysis Results

Table 3. Results of Construct Validity and Reliability Tests

Construct	Indicator	Outer Loading	CA	CR	AVE	Description
APIP Effectiveness	APIP Effectiveness 1	0.809	0.890	0.890	0.670	Valid & Reliable
	Effectiveness of APIP2	0.824				Valid
	Effectiveness of APIP3	0.808				Valid
	APIP4 Effectiveness	0.833				Valid
External Auditor	External Auditor 1	0.864	0.912	0.904	0.673	Valid & Reliable
	External Auditor 2	0.851				Valid
	External Auditor 3	0.848				Valid
	External Auditor 4	0.730				Valid
	External Auditor 5	0.801				Valid
Independence	Independence 1	0.776	0.838	0.823	0.509	Valid & Reliable
	Independence 2	0.653				Considered
	Independence 3	0.605				Considered
	Independence 4	0.649				Considered
	Independence 5	0.853				Valid
Integrity Reporting	Integrity Rept 1	0.886	0.944	0.946	0.778	Valid & Reliable
	Integrity Rept 2	0.939				Valid
	Integrity Rept 3	0.919				Valid
	Integrity Rept 4	0.930				Valid
	Integrity Rept 5	0.717				Valid
Competency	Competency 1	0.833	0.875	0.872	0.598	Valid & Reliable
	Competency 2	0.820				Valid
	Competency 3	0.822				Valid
	Competency 4	0.775				Valid
	Competency 5	0.588				Considered
Management	Management 1	0.780	0.864	0.864	0.615	Valid & Reliable
	Management 3	0.748				Valid
	Management 4	0.810				Valid
	Management 5	0.797				Valid
Audit Probity	Probity 1	0.785	0.899	0.897	0.695	Valid & Reliable
	Probity 2	0.905				Valid
	Probity 3	0.804				Valid
	Probity 4	0.835				Valid
SPBE	SPBE1	0.600	0.864	0.866	0.572	Considered
	SPBE2	0.702				Valid
	SPBE3	0.879				Valid
	SPBE4	0.711				Valid
	SPBE5	0.852				Valid
SustainPBJ	SustainPBJ1	0.789	0.945	0.930	0.689	Valid & Reliable
	SustainPBJ2	0.818				Valid
	SustainPBJ3	0.817				Valid
	SustainPBJ4	0.870				Valid
	SustainPBJ5	0.839				Valid
	SustainPBJ6	0.847				Valid

Source: compiled by the researcher

The results in Table 3, from the measurement model evaluation, show that most indicators have an outer loading of ≥ 0.70 , while the Cronbach's Alpha and Composite Reliability values for all constructs are above 0.70. The AVE values for all constructs also exceed 0.50, with the lowest value being 0.509 for the Independence construct. Several indicators with outer loadings below 0.70 namely Competence5, Independence2, Independence3, Independence4, and SPBE1 need to be considered

based on their contribution to construct validity. Overall, the research constructs have met the criteria for reliability and convergent validity.

Discriminant Validity Test

Discriminant validity was assessed using the Heterotrait-Monotrait (HTMT) index and the Fornell-Lacker test. The recommended values for the discriminant validity test and the Fornell-Lacker test indicate that a good criterion is a value below 0.90 (Shumacker & Lomax, 2010 ; Sihombing & Arsani, 2022) . The validity test results show that all variable elements have values below 0.90.

Table 4. Results of the HTMT and Fornell-Larcker Discriminant Validity Tests

Construct	APIP Effectiveness	External Auditor	Independence	Integrity Reporting	Competence	Management	Audit Probity	SPBE	SustainPBJ
APIP Effectiveness	0.818	0.588	0.862	0.808	0.800	0.875	0.892	0.725	0.649
External Auditor	0.598	0.820	0.701	0.585	0.533	0.619	0.644	0.728	0.608
Independence	0.888	0.692	0.713	0.776	0.863	0.871	0.828	0.733	0.655
Integrity Reporting	0.882	0.713	0.692	0.882	0.679	0.764	0.801	0.686	0.582
Competence	0.792	0.522	0.856	0.773	0.773	0.765	0.719	0.680	0.558
Management	0.875	0.636	0.870	0.740	0.784	0.740	0.814	0.742	0.584
Audit Probity	0.888	0.633	0.841	0.809	0.698	0.809	0.834	0.781	0.698
SPBE	0.673	0.756	0.733	0.673	0.756	0.756	0.756	0.756	0.735
SustainPBJ	0.453	0.408	0.437	0.270	0.341	0.376	0.417	0.484	0.830

Source: compiled by the researcher

The test results in Table 4 show that the HTMT values between constructs are below the 0.90 threshold, thus generally meeting the criteria for discriminant validity. The highest HTMT value is 0.892 for the relationship between APIP Effectiveness and Audit Probity, but it is still below the 0.90 threshold. Meanwhile, the Fornell-Larcker diagonal values are higher than the correlations of the related constructs, so the Fornell-Larcker criteria are also met. Thus, the research constructs can be empirically distinguished and are suitable for use in structural equation modeling.

Table 5. Model Fit Test (Goodness of Fit)

No	Goodness-of-Fit Index	Result	Criteria/Value Threshold	Notes
1	RMSEA (<i>Root Mean Square Error of Approximation</i>)	0.074	≤ 0.08	Meets the criteria
2	CFI (<i>Comparative Fit Index</i>)	0.876	≥ 0.90	Does Not Meet
3	Chi-Square/ df (<i>Normed Chi-Square</i>)	2.752	≤ 3.00	Meets the criteria
4	NFI/TLI* (<i>Tucker-Lewis Index</i>)	0.818	≥ 0.90	Does Not Meet
5	SRMR (<i>Standardized Root Mean Square Residual</i>)	0.275	≤ 0.10	Does Not Meet

Source: compiled by the researcher

Based on Table 5, the Goodness of Fit results indicate that some indices have met the criteria. The RMSEA value of 0.074 and the Chi-Square/ df value of 2.752 meet the established thresholds. However, the CFI of 0.876, the TLI of 0.818, and the SRMR of 0.275 do not yet meet the criteria. Thus, the model fit is not yet fully optimal, so the interpretation of the model must take into account all indicators and the underlying theoretical framework.

Table 6. R-Square Test Results

Variable	R-Square
Probity	0.813
SustainPBJ	0.440

The R² value for Probity Audit of 0.813 (81.3%) indicates that the model explains 81.3% of the variation in the Probity Audit variable, while 18.7% is influenced by other factors outside the model. Meanwhile, the R² value for Sustainable Goods and Services Procurement of 0.440 (44%) indicates that the model explains 44% of the variation in this variable, while 56% is explained by other factors outside the model.

Structural Model Testing

The results of testing the independent and control variables against the dependent variable can be summarized as follows:

Table 7. Structural Model Test

Variable	Coefficient	Probability (P-value)
Effectiveness of APIP → Probity	0.835	0.000**
Effectiveness of APIP → SustainPBJ	0.265	0.118
External Auditor → Probity	0.094	0.041*
External Auditor → SustainPBJ	0.146	0.015**
Competence → Probity	-0.153	0.077
Competence → SustainPBJ	-0.080	0.271
Independence → Probity	0.304	0.069
Independence → SustainPBJ	0.109	0.330
Management → Probity	0.014	0.456
Management → SustainPBJ	-0.249	0.061
Probity → SustainPBJ	0.256	0.025*
IntegrityRept → SustainPBJ	-0.018	0.412
SPBE → SustainPBJ	0.466	0.000**

*significant at the 5% level

**significant at the 1% alpha level

The results of testing the independent variables against the dependent variable with the mediating variable can be summarized as follows:

Table 8. Mediation Structural Model Test

Variable	Coefficient	Probability (P-value)	Uplison Test
Effectiveness of APIP → Probity → SustainPBJ	0.214	0.000** and 0.025*	Moderate
External Auditor → Probity → SustainPBJ	0.024	0.041* and 0.025*	Low
Independence → Probity → SustainPBJ	0.078	0.069 and 0.025**	Low
Competence → Probity → SustainPBJ	-0.039	0.077 and 0.025**	Low
Management → Probity → SustainPBJ	0.004	0.456 and 0.025**	Low

*significant at the 5% alpha level

**significant at the 1% alpha level

Source: compiled by the researcher

To measure the strength of the indirect effect, the Uplison calculation was used (Ogbeibu et al., 2021) with the following calculation method:

$$v = \beta^2MX \cdot \beta^2YM \cdot X$$

where v β^2MX is the square of the path coefficient from X to M , $\beta^2YM \cdot X$ is the square of the path coefficient from M to Y , and V is a measure of the mediation effect classified as low (< 0.01), moderate ($0.01 - 0.074$), high ($0.074-0.175$), and very high (>0.175).

Table 9. Uplison Model Test

Variable	Coefficient X	Coefficient M	U	Criteria
APIP Effectiveness -> Probity -> SustainPBJ	(0.835) ²	(0.256) ²	0.046	Moderate
External Auditor -> Probity -> PBJ Sustainability	(0.094) ²	(0.256) ²	0.001	Low
Independence -> Probity -> SustainPBJ	(0.304) ²	(0.256) ²	0.006	Low
Competence -> Probity -> SustainPBJ	(-0.153) ²	(0.256) ²	0.002	Low
Management -> Probity -> SustainPBJ	(0.014) ²	(0.256) ²	0.000	Low

The structural model that can be constructed based on the data processing results can be described as follows:

Direct modeling:

$$Probity\ Audit\ (PA)_i = 0.835EPIPi + 0.094EAi + 0.304IPIPi - 0.153KPIPi + 0.014DM + \varepsilon_i$$

$$Sustainable\ PBJ = 0.265EPIPi + 0.146EAi + 0.109IPIPi - 0.080KPIPi - 0.249DMi + 0.466SPBEi - 0.018IR + \varepsilon_i$$

Indirect modeling:

$$Sustainable\ PBJ_i = 0.214\ PA*EPIPi + 0.024\ PA*EAi + 0.078\ PA*IPIPi - 0.039\ PA*KPIPi + 0.004\ PA*DM + \varepsilon_i$$

Discussion

The research results indicate that the effectiveness of the government's internal control has a positive and significant effect on probity audit, with a coefficient of 0.835 and a p-value of 0.000. These findings suggest that the more effective the implementation of internal oversight functions, the stronger the application of probity audit. This effectiveness is reflected in APIP's compliance with oversight standards, risk-based planning, communication of oversight results to leadership, updates to work procedures, and regular interaction with management. Collaboration between APIP, management, and external auditors is necessary to strengthen oversight without compromising the independence of each party. However, the effectiveness of internal controls does not have a significant effect on sustainable public procurement of goods and services, with a coefficient of 0.265 and a p-value of 0.118. This finding indicates that the existence of internal oversight does not automatically result in sustainable procurement. Based on the interview results, there are two main issues: oversight activities that are not yet fully substantively risk-based, and recommendations from oversight findings that have not received adequate follow-up from management. These conditions can reduce APIP's motivation to carry out oversight optimally.

Furthermore, the role of external auditors has a positive and significant effect on probity audit, with a coefficient of 0.094 and a p-value of 0.041. External auditors play a role through cooperation with internal auditors, information exchange, discussions on audit planning, and collaboration in

achieving audit objectives. This role also has a significant effect on sustainable public procurement of goods and services, with a coefficient of 0.146 and a p-value of 0.015. This finding highlights the importance of external auditors' contributions in identifying control weaknesses and providing recommendations for improvement. Conversely, the competence of the APIP does not have a significant effect on audit probity or sustainable public procurement of goods and services. The effect on audit probity has a coefficient of -0.153 with a p-value of 0.077, while the effect on sustainable procurement has a coefficient of -0.080 with a p-value of 0.271. Interview results indicate that the limitations of the Internal Audit Agency including insufficient staffing, mismatched educational backgrounds, inadequate training, heavy workloads, and budget constraints pose challenges to the development of APIP competencies. APIP independence also does not show a significant influence on probity audits or sustainable public procurement of goods and services. The coefficient for probity audits was 0.304 with a p-value of 0.069, while for sustainable procurement it was 0.109 with a p-value of 0.330. These conditions are related to structural bureaucratic challenges, the relationship between APIP and the auditee, pressure from leadership, and limitations in the scope of oversight.

Overall, the research findings indicate that strengthening probity audits is more closely linked to the effectiveness of internal controls and external support for auditors, while the success of sustainable procurement of goods and services requires more than just the existence of an oversight function. Risk-based oversight, consistent follow-up on recommendations, capacity building for APIP, resource support, and the strengthening of institutional independence are necessary for oversight to bring about tangible improvements in government procurement governance.

6. Conclusion

The research findings indicate that the effectiveness of government internal controls has a positive and significant effect on probity audits but does not have a direct effect on sustainable procurement of goods and services. However, the effectiveness of internal controls does influence sustainable procurement through probity audits as a mediator. This indicates that probity audits serve as a crucial mechanism for translating the effectiveness of internal controls into more sustainable procurement oversight. The role of external auditors was found to have a positive and significant effect on both probity audits and sustainable procurement of goods and services. The influence of external auditors on sustainable procurement through probity audits was also found, albeit at a low level. These findings highlight the importance of collaboration between external auditors and the APIP in strengthening oversight and ensuring that procurement processes align with governance principles.

Conversely, the independence of APIP does not have a significant effect on probity audits, sustainable procurement of goods and services, or mediating relationships through probity audits. This situation is related to structural bureaucratic constraints, particularly the fact that inspectors remain under the coordination of the regional secretary, as well as the potential for pressure or transfers when oversight activities conflict with the interests of regional leaders. APIP's competence also does not have a significant impact on probity audits, sustainable procurement, or relationships established through probity audits. One factor explaining this situation is the imbalance between the volume of work and the number of APIP personnel, which limits opportunities to participate in ongoing professional education and training.

Management support does not show a significant influence on probity audits or sustainable procurement of goods and services. The leadership's limited understanding of internal control responsibilities is one factor contributing to constraints on budgetary support and the number of APIP personnel. Meanwhile, probity audits have a positive and significant impact on sustainable public

goods and services procurement through oversight at the planning, supplier selection, implementation, handover, and maintenance stages. Furthermore, the Electronic Goods and Services Procurement System (SPBE) has a positive and significant effect on sustainable procurement because it provides prospective suppliers with more proportional opportunities to compete fairly. Conversely, the integrity of financial reports does not have a significant effect on sustainable procurement of goods and services.

Theoretically, this study reinforces institutional theory, contingency theory, and the Three Lines Model. Practically, this study recommends integrating probity audits into the entire procurement cycle, strengthening the competence and independence of APIPs, increasing resource support, optimizing the SPBE, and strengthening the role of external auditors. Moving forward, future research should incorporate the vendors' perspective and distinguish the characteristics of local government APIPs from those of ministries and agencies.

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