

Optimizing State Asset Management: A Performance-Based Analysis of Commitment, Competence, and Budget with Moderation by Internal Control and Asset Management Information Systems

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Abstract

Purpose – This study examines the factors influencing the performance of state-owned assets (Barang Milik Negara, BMN) management in central government institutions in West Java, Indonesia. It evaluates the roles of organizational commitment, human resource competence, and budget availability, considering the moderating effects of the internal control system and the asset management information system.

Design/methodology/approach – This quantitative study employed a survey method. Data were collected through questionnaires distributed to 253 heads of work units in central government institutions in West Java. The analysis was conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS) to examine the relationships among variables and moderating effects.

Findings – The results indicate that organizational commitment does not have a significant effect on BMN management performance. Human resource competence shows a positive effect that is statistically significant at the 10% level, although the strength of this relationship is relatively weak, while budget availability has a positive and significant effect. The internal control system shows a moderating effect on the relationships between organizational commitment and budget availability and BMN management performance at the 10% level, although the strength of these effects is limited. In contrast, the asset management information system does not show a significant moderating effect but has a positive and significant direct effect on BMN management performance.

Research limitations/implications – This study is limited to central government institutions in West Java; therefore, the findings may not be directly generalizable to other regions or governance contexts. Future research may consider longitudinal approaches or examine additional factors such as regulatory frameworks and leadership styles.

Practical implications – The findings suggest that budget availability and, to a lesser extent, human resource competence play important roles in BMN management performance. Strengthening the internal control system may support the effectiveness of organizational commitment and budget management, while improving the integration and utilization of the asset management information system is necessary to enhance its contribution to asset management performance.

Social implications – Effective state-owned asset management supports public sector accountability by ensuring that government assets are utilized efficiently for societal benefit. Strengthening governance mechanisms may also contribute to increased public trust in asset utilization.

Originality/value – This study integrates agency theory, resource-based theory, and public budgeting theory to develop a comprehensive model of BMN management performance. It provides insights into the differing roles of internal control systems and asset management information systems, highlighting the interaction between governance mechanisms, organizational resources, and fiscal capacity in the public sector.

Keywords *Organizational Commitment, Human Resource Competence, Budget Availability, BMN Management Performance, Asset Management Information System, Internal Control System, Agency Theory, Resource-Based Theory, Public Budgeting Theory.*

1. Introduction

Over the last three decades, public asset management in the United States has faced persistent issues such as loss, wastage, misuse, obsolescence, failure, and damage to fixed assets. Serious accidents involving infrastructure assets have also caused damage, injuries, and fatalities (Lu, 2017), indicating the need for improved management systems. A similar pattern appears in Malaysia, where inefficiency, ineffectiveness, and mismanagement of government assets are frequently reported, while public awareness of asset misuse is increasing because procurement involves public funds, making the credibility and accountability of government officials a primary concern (Ismail *et al.*, 2019). Developing countries face similar challenges in achieving efficient public asset management, highlighting the need for reforms in asset utilization and outcome measurement (Grubisic *et al.*, 2008).

Fixed assets play a vital role in supporting government activities and public service delivery, particularly infrastructure such as transportation systems, communications, drainage, water supply, sewage systems, dams, road networks, and lighting systems, which require multidisciplinary strategies to ensure service sustainability (Lu, 2017). In Malaysia, the 2009 asset management policy emphasized the direction and implementation of state asset management, given the significant investment required to provide public facilities (Abu Backer and Wan Yusoff, 2015). In Indonesia, the enactment of Law Number 17 of 2003 on State Finance required the government to prepare the Central Government Financial Report (Laporan Keuangan Pemerintah Pusat, LKPP) for the first time in 2004, recording assets valued at Rp851.88 trillion, of which Rp465.27 trillion were fixed assets, as reported in the balance sheet, cash flow statement, budget realization, and notes to the financial statements. From 2004 to 2021, the Audit Board of Indonesia (Badan Pemeriksa Keuangan, BPK) issued a series of evolving opinions on the LKPP, ranging from disclaimer opinions (2004–2008) to modified opinions (2008–2015), and eventually unmodified opinions (Wajar Tanpa Pengecualian, WTP) from 2016 to 2021, reflecting gradual improvements in state asset management.

Although the LKPP has obtained an unmodified opinion since 2016, many state assets remain “dormant” and have not been optimally utilized (Antara, 2018), indicating that improvements in reporting quality have not fully translated into effective asset utilization. State assets are expected to be used productively to benefit the public; therefore, the Minister of Finance requested the Directorate General of State Assets (Direktorat Jenderal Kekayaan Negara, DJKN) to collaborate with ministries and agencies in promoting more productive asset use. This issue of underutilized assets also underlies the issuance of Minister of Finance Decision (Keputusan Menteri Keuangan, KMK) number 349/KM.6/2018 on the Procedures for Evaluating the Performance of State-Owned Assets (Barang Milik Negara, BMN), which assesses land and/or building performance based on six aspects: public purpose, social impact, user satisfaction, technical condition, financial feasibility, and future opportunities. In September 2020, the Audit Board of Indonesia (BPK) reported recurring issues in BMN management within ministries and agencies, including non-compliant utilization, inaccurate record-keeping, and insufficient evidence of land ownership (BPK, 2016). BPK also provided recommendations to ministers and agency heads to improve BMN management quality across work units to prevent similar issues. As state assets sourced from the state budget (Anggaran Pendapatan dan Belanja Negara, APBN), BMN must be managed productively to maintain public trust in taxation (Grubišić *et al.*, 2009; Jolicœur & Barrett, 2005). In Indonesia, following revaluation, the value of fixed assets increased from Rp1.93105 trillion to Rp5.94959 trillion, equivalent to 37.6% of the 2019 GDP of Rp15.8339 trillion (BPS, 2019), while the average government asset ownership across 32 countries reaches 67% of GDP (Bova *et al.*, 2013). Fixed assets, current assets, and other assets contributed 69% of the total LKPP balance after the 2018 BMN revaluation, highlighting the substantial role of state assets in public financial management.

According to Government Accounting Standards (SAP), BMN is recorded in the LKPP as current assets, fixed assets, and other assets, with values that continue to increase. BMN management policies are directed toward ensuring that state assets generate added value through expenditure efficiency and the potential for non-tax state revenue (Pendapatan Negara Bukan Pajak, PNBP), particularly from the utilization of idle assets based on the “highest and best use” principle (Appraisal Institute, 2008). Accordingly, state asset management has shifted from an administrative function to a more strategic approach aimed at improving effectiveness, efficiency, and accountability, making asset performance measurement increasingly important for enhancing productivity and maximizing investment returns (Parida, 2016). However, a major challenge in performance measurement lies in the absence of a structured system (Kish, 2005), alongside the need for standardized public asset performance measurement frameworks highlighted in prior studies (Puspitarini *et al.*, 2019; Attwater *et al.*, 2014; Gavrikova *et al.*, 2020; Vilarinho *et al.*, 2023). Therefore, optimizing BMN management requires collaboration between asset managers and users to achieve more efficient, effective, and accountable outcomes. Empirical studies on the management of state-owned assets (Barang Milik Negara, BMN) show inconsistent findings regarding the factors influencing asset management effectiveness. Several studies highlight the roles of organizational commitment, human resource competence, and budget availability in determining BMN performance. Rashid *et al.* (2003) in Malaysia found that organizational commitment significantly affects company performance, consistent with Sulistiawati (2016) in Indonesia, who showed that the involvement of all management levels contributes to BMN management effectiveness. However, Gunawan *et al.* (2017) in Makassar reported that organizational commitment does not directly affect asset management quality, in line with Yiing and Ahmad (2009) in an academic context. Similarly, studies by Astini (2018), Arlini *et al.* (2014), and Prihatini *et al.* (2020) found that human resource competence influences asset

management effectiveness, whereas Mardianto (2021) and Briha *et al.* (2019) reported no significant effect. More complex findings were reported by Fernandes *et al.* (2005) in Brazil, who showed that individual competence is not the main driver of performance, with work environment and employee satisfaction playing a more significant role.

Studies on the influence of budget availability on BMN management show mixed findings. Kusuma and Nyoman Djinar (2021) found that well-managed budgets support asset optimization. However, Prihatini *et al.* (2020) and Mardianto (2021) reported that compensation for asset managers does not significantly affect asset management effectiveness. In terms of the Internal Control System, Ekayanti *et al.* (2018) and Rosihan *et al.* (2017) found a positive effect on regional asset management effectiveness, whereas Syaifudin *et al.* (2020), in a study of 27 local governments in West Java, reported no significant effect. Similarly, studies on information systems show inconsistent results. Rosihan *et al.* (2017), Astini (2018), and Azhar (2017) found that information system implementation improves asset management effectiveness, while Ratmono and Rochmawati (2018), Belo *et al.* (2018), and Ismail *et al.* (2019) reported no significant impact on asset management capacity.

These contradictory findings indicate the complexity of BMN management, which may be influenced by additional contextual factors such as organizational structure, regulatory frameworks, and work environment. This inconsistency suggests that asset management effectiveness cannot be explained by a single factor but rather by the interaction of multiple components within the public asset management system.

In this study, the novelty lies in the use of a multivariate research model that enables several variables to be examined simultaneously, which has not been specifically applied in the context of BMN management. The model is developed based on prior empirical studies that have examined these variables separately and integrates them into a single conceptual framework grounded in agency theory, resource-based theory, and public budgeting theory.

In agency theory, conflicts of interest and information asymmetry typically position the agent as having greater knowledge than the principal (Jensen and Meckling, 1976). However, in BMN management, this relationship is reversed, where the principal (asset manager) holds greater information and control than the agent (asset user). This study also adopts resource-based theory (Al Marzooqi *et al.*, 2019), which classifies resources into human, technological, and financial elements, adapted to the public sector context where financial resources originate from the state budget (APBN) and must be allocated based on priorities. In addition, public budgeting theory suggests that organizational effectiveness increases when there is competition in obtaining budgets for asset optimization (Boyne, 1996). In this study, these theoretical perspectives are operationalized through the independent variables of organizational commitment, human resource competence, and budget availability, with BMN management performance as the dependent variable.

The novelty of this study also lies in the selection of moderating variables, namely the Internal Control System and the Asset Management Information System, which have more commonly been treated as independent variables in prior studies (Ismail *et al.*, 2019). The Internal Control System is considered important because the government adopted the Government Internal Control System (Sistem Pengendalian Internal Pemerintah, SPIP) following Government Regulation No. 60/2008 to address issues such as dormant assets and recurring audit findings by the Audit Board of Indonesia. From an agency theory perspective, strengthening the Internal Control System functions as a supervisory mechanism to reduce conflicts of interest and information asymmetry between asset managers (principals) and asset users (agents), thereby supporting more accountable asset management aligned with public interests.

Similarly, the Asset Management Information System, which evolved from the BMN Accounting System (Sistem Akuntansi BMN, SABMN) in 2008, is positioned as a moderating variable because it is not a direct organizational resource but influences the relationship between independent and dependent variables. From a resource-based theory perspective, this system reflects the government's strategy in leveraging technology to enhance the effectiveness of state asset management. Through the Asset Management Information System, asset recording, monitoring, and optimization can be carried out more accurately and transparently, thereby strengthening the effectiveness of public asset management policies.

However, in the implementation of both systems, a major challenge lies in limited budgets and suboptimal resource allocation. From the perspective of public budgeting theory, this constraint reflects fiscal limitations and political considerations in government budget setting for state asset management. In this context, the effectiveness of the Internal Control System and the Asset Management Information System depends not only on system efficiency but also on how government budgeting policies are designed to support BMN optimization while maintaining fiscal discipline.

The moderating variables in this study conceptually resemble contingency variables (Liana, 2009), which can strengthen or weaken the relationships among the main variables in the research model. The integration of agency theory, resource-based theory, and public budgeting theory into a multidimensional framework provides a more comprehensive understanding of control systems and asset optimization. From an agency theory perspective, internal control systems play a key role in reducing conflicts of interest in public asset management through supervision and control mechanisms.

From a resource-based theory perspective, technology and competence play an important role in improving asset efficiency, particularly through the Asset Management Information System. Meanwhile, public budgeting theory emphasizes that effective fiscal policies are essential to ensure the sustainability and efficiency of budget allocation in BMN management. Therefore, by proposing an integrated conceptual model, this study contributes to the literature by demonstrating how these three theoretical perspectives can be combined to enhance the efficiency of state asset management in the public sector.

2. Literature Review

2.1. Theoretical Perspectives on Public Asset Management

In academic discussions on the application of agency theory in the public sector, debates persist regarding its relevance and limitations beyond private entities. Jensen and Meckling (1976) originally developed agency theory to explain principal-agent relationships in a corporate context, where conflicts of interest arise because agents may pursue their own interests. However, some scholars argue that its application in the public sector is less straightforward, as the relationship between the public as principals and the government as an agent is more complex than that between shareholders and corporate management (Hill and Jones, 1992).

In the context of state asset management, this complexity requires adaptation of agency theory, as the government not only acts as an agent of the public but also operates within intergovernmental relationships, such as those between the Ministry of Finance and technical ministries in managing State-Owned Assets (Barang Milik Negara, BMN). Temizel (2015) highlights that the public sector has characteristics—such as bureaucratic structures, strict regulations, and public welfare objectives—that cannot be fully explained by conventional agency theory. Accordingly, inter-ministerial relationships in BMN management can be likened to the interaction between a Chief Financial Officer (CFO), represented by the Minister of Finance, and a Chief Operating Officer (COO), represented by technical ministers, although this analogy requires institutional adjustment. Despite these limitations, proponents such as Glynn and Murphy (2008) argue that the core principles of agency theory remain relevant, particularly in explaining the need to monitor and control government actions to ensure alignment with public interests.

The debate becomes more complex when resource-based (RB) theory (Barney, 1991) is incorporated into the analysis of BMN management, as it emphasizes that the effectiveness of public assets depends on the government's ability to possess and utilize resources that are valuable, rare, difficult to imitate, and supported by organizational capacity. However, Mathur *et al.* (2014) argue that in the public sector, resource availability alone is insufficient without clear organizational support and policies to ensure effective asset management. In this context, the key issue is whether constraints in BMN management arise primarily from information asymmetry among asset users or from weak bureaucratic commitment to implementing optimal asset management principles. Panda and Leepsa (2017) note that information asymmetry can distort decision-making in the public sector, while Eisenhardt (2018) highlights that differences in risk attitudes between principals and agents may further complicate asset management. However, in BMN management, information asymmetry does not operate in the same way as in the corporate context. The principal, namely the Ministry of Finance as the asset manager, often possesses more information than the agents, namely technical ministries as asset users. Therefore, BMN management involves not only reducing information asymmetry but also ensuring coordination and compliance among institutions responsible for managing state assets. According to public budgeting theory, as proposed by Lewis (1952), scarce resources should be allocated in a way that maximizes benefits to society. However, the gap between this theoretical ideal and practical reality presents a challenge for optimizing state asset management. In practice, budgeting is often shaped by political considerations and bureaucratic priorities, which may reduce efficiency. In the context of BMN, central government fiscal policies can also direct funding toward objectives beyond operational needs.

These conditions suggest that public budgeting theory alone may not be sufficient to address the complexities of asset governance and should be complemented by agency theory and resource-based theory. Beyond this theoretical debate, BMN management also faces operational challenges, requiring effective supervision of resources and sustainable financing arrangements to improve efficiency and performance in the public sector.

These three theories—agency theory, resource-based theory, and public budgeting theory—each contribute to improving state asset management. Agency theory explains how controlling the relationship between asset managers and users helps ensure alignment with public interests. Resource-based theory highlights

the importance of effectively managing human, technological, and financial resources to support asset performance. Meanwhile, public budgeting theory emphasizes the need for efficient and value-oriented allocation of BMN across sectors.

By integrating these perspectives, the government can develop a more transparent, accountable, and efficient asset governance system, supported by clear rules, adequate institutional capacity, and effective oversight to enhance BMN performance.

2.2. Hypotheses Development

The relationship among organizational commitment, human resource competence, budget availability, the Internal Control System, and the Asset Management Information System has been widely discussed in organizational theory and public asset management. Agency theory (Jensen and Meckling, 1976) suggests that the interaction between asset managers and asset users in public organizations reflects a principal-agent relationship, where conflicts of interest, information asymmetry, and differences in risk perception may hinder the optimization of state assets. However, in the context of State-Owned Asset (BMN) management, this relationship tends to be reversed, with the principal (asset manager) holding greater information and control than the agent (asset user). This condition indicates that suboptimal utilization of BMN may not only be caused by limited information but also by weaknesses in accountability mechanisms within the bureaucracy, which can affect how organizational commitment, competence, and resource allocation contribute to asset management performance. From the perspective of resource-based theory (Barney, 1991), human resource competence is an intangible asset that plays a key role in determining the effectiveness of BMN management. The quality of organizational resources—particularly human resources, technology, and budget—can serve as a differentiating factor in improving the efficiency of state asset management. However, while organizations generally have control over human resources and technology, their authority over budget management is more limited in the public sector. Public organizations operate under constrained resources and fixed allocations, including budgets for developing and managing state assets. As emphasized in public budgeting theory (Lewis, 1952), budget allocation in the public sector is driven more by priority considerations than by pure financial efficiency. In practice, budget constraints often arise not only from limited funds but also from fiscal policies and political processes. Therefore, the relationship between budget availability and BMN management is not purely direct but is shaped by broader institutional and policy factors. To address these challenges, the Internal Control System functions as a mechanism to reduce information imbalance and strengthen accountability in state asset management (Fitri, 2016). However, in the digital era, internal control alone is insufficient without the support of information technology. The Asset Management Information System therefore plays a strategic role in improving transparency, accuracy, and data-based decision-making in managing state assets. This discussion highlights the interconnection among organizational commitment, human resource competence, budget availability, and the roles of the Internal Control System and the Asset Management Information System in BMN management, which together form a complex relationship influenced by regulations, fiscal policies, and bureaucratic culture rather than a simple direct linkage. In contrast to the private sector, where asset productivity is driven by market forces and competition, BMN performance in the public sector depends on how effectively the bureaucracy adopts modern asset management practices aligned with principles of good governance.

Therefore, optimizing BMN management requires not only strengthening internal operational capacity but also improving control systems and implementing technologies that support accountability and long-term asset sustainability. Based on these considerations, this study proposes the following hypotheses:

- H1:** Organizational commitment positively affects BMN management performance.
- H2:** Human resource competence positively affects BMN management performance.
- H3:** Budget availability positively affects BMN management performance.
- H4:** The Internal Control System strengthens the effect of organizational commitment on BMN management performance.
- H5:** The Internal Control System strengthens the effect of human resource competence on BMN management performance.
- H6:** The Internal Control System strengthens the effect of budget availability on BMN management performance.
- H7:** The Asset Management Information System strengthens the effect of organizational commitment on BMN management performance.
- H8:** The Asset Management Information System strengthens the effect of human resource competence on BMN management performance.
- H9:** The Asset Management Information System strengthens the effect of budget availability on BMN management performance.

3. Methodology

3.1. Research Design

This study employed a quantitative approach using a survey method to examine the relationship between organizational commitment (ξ_1), human resource competence (ξ_2), and budget availability (ξ_3) and BMN management performance (η_1), with the Internal Control System (ξ_4) and the Asset Management Information System (ξ_5) as moderating variables. Data were collected through a questionnaire distributed to heads of central government work units in West Java using purposive sampling to ensure that respondents had the authority and experience in BMN management. This study applied an explanatory research design to test both direct effects and moderating influences among variables.

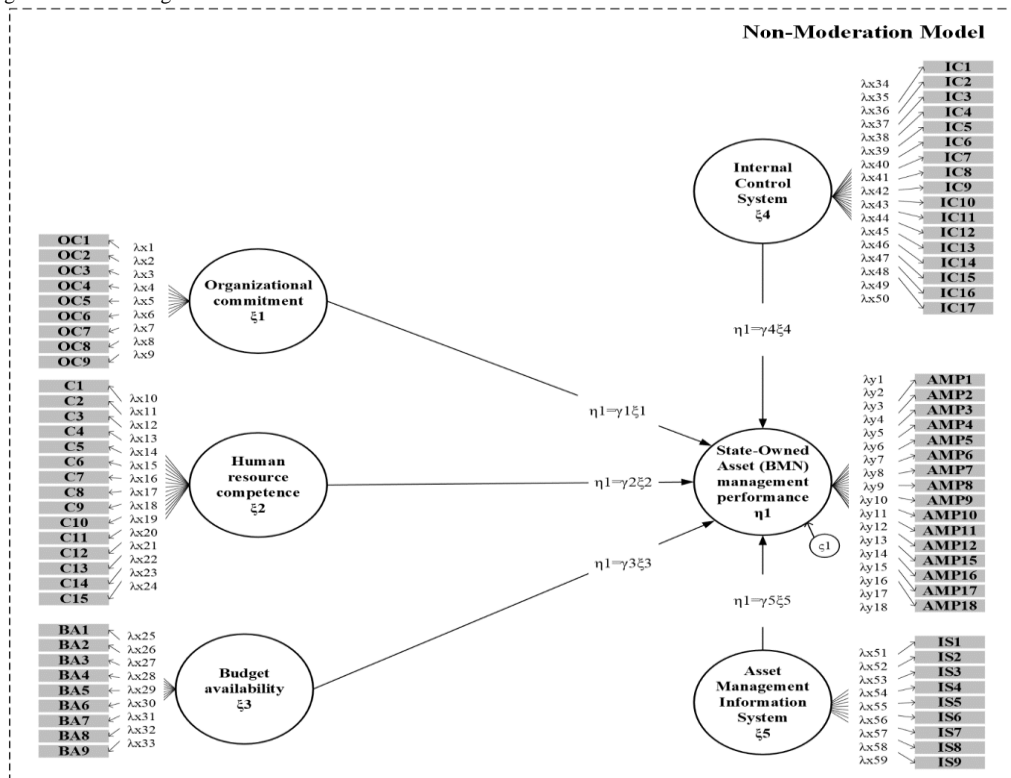


Figure 1. Structural Model Without Moderation

The model developed in this study examines organizational commitment, human resource competence, and budget availability through two approaches. First, it analyzes their direct effects on BMN management performance without considering moderating variables. Second, it evaluates how the Internal Control System and the Asset Management Information System influence these relationships. Figure 1 presents the structural model without moderation, showing the direct relationships between the independent variables and BMN management performance, while Figure 2 illustrates the moderated model, where these relationships may vary in strength or direction. In the non-moderation model, organizational commitment, human resource competence, and budget availability, along with the Internal Control System and the Asset Management Information System, are specified as independent variables directly affecting BMN management performance, as expressed in the following equation:

$$\eta_1 = \gamma_1\xi_1 + \gamma_2\xi_2 + \gamma_3\xi_3 + \gamma_4\xi_4 + \gamma_5\xi_5 + \varepsilon \dots\dots\dots (1)$$

where η_1 represents BMN management performance, while ξ_1 , ξ_2 , and ξ_3 represent organizational commitment, human resource competence, and budget availability, and ξ_4 and ξ_5 represent the Internal Control System and the Asset Management Information System, respectively.

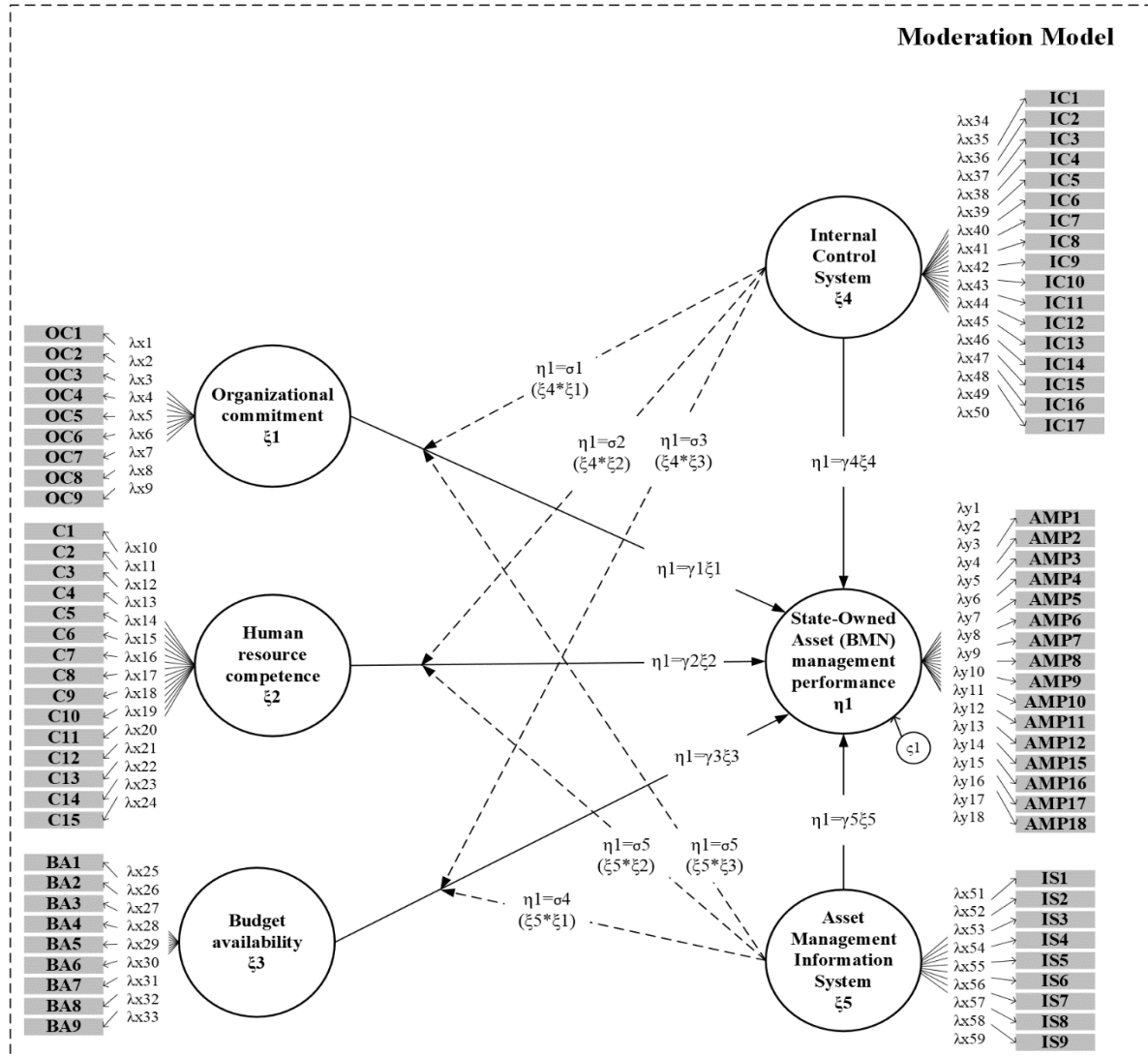


Figure 2. Structural Model with Moderation

The moderation model was developed to examine whether the Internal Control System and the Asset Management Information System strengthen or weaken the relationships between the independent variables and BMN management performance. In this model, both variables function as moderating factors that can alter the strength or direction of these relationships. The moderation model is expressed as follows:

$$\eta_1 = \gamma_1\xi_1 + \gamma_2\xi_2 + \gamma_3\xi_3 + \gamma_4\xi_4 + \gamma_5\xi_5 + \sigma_1(\xi_4 \times \xi_1) + \sigma_2(\xi_4 \times \xi_2) + \sigma_3(\xi_4 \times \xi_3) + \sigma_4(\xi_5 \times \xi_1) + \sigma_5(\xi_5 \times \xi_2) + \sigma_6(\xi_5 \times \xi_3) + \varepsilon \quad (2)$$

In this equation, σ_1 to σ_6 represent the moderation coefficients, indicating how the Internal Control System and the Asset Management Information System interact with the independent variables in influencing BMN management performance.

SEM-PLS was implemented to analyze the data, allowing for the examination of complex cause-and-effect relationships and conditional effects within the proposed model. This technique enables the simultaneous estimation of both direct and moderating relationships while remaining suitable for datasets with relatively small sample sizes. Through this approach, the study established a framework that quantifies the direct effects of organizational commitment, human resource competence, and budget availability on BMN management performance, as well as the extent to which the Internal Control System and the Asset Management Information System influence these relationships. This approach provides a clearer understanding of state asset management performance, particularly in how governance mechanisms and technological systems contribute to improving public asset management outcomes.

3.2. Population and Sample

As of early 2022, more than six hundred government officials were responsible for managing state assets across ministries and agencies in West Java Province. Specifically, 690 heads of work units under the West Java office of the Directorate General of State Assets were identified, typically holding ranks from Penata Tingkat I (III/d) to Pembina Utama Madya (IV/d). Using proportional random sampling with a 5% margin of error, 253 respondents were selected based on the Slovin formula. To ensure balanced representation, the sample was proportionally distributed across six Property and Auction Service Offices: 87 respondents from Bandung, 62 from Bogor, 36 from Cirebon, 28 from Tasikmalaya, 22 from Purwakarta, and 18 from Bekasi.

This study applied a causal analysis approach using Structural Equation Modeling (SEM) as the analytical tool. SEM requires a minimum sample size of 10 times the number of formative indicators (Hair *et al.* 2021), suggesting a range of 100–200 observations. In implementation, 260 work unit heads were invited to participate, and 257 valid responses met the research criteria for further analysis. The respondents represented 31 ministries and agencies, with the highest participation

rates from the Ministry of Finance (16.73%), Ministry of Religious Affairs (9.73%), Ministry of Law and Human Rights (8.17%), Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (7.78%), and the Central Bureau of Statistics (7.39%).

By gender, the majority of respondents were male (70.43%), while female respondents accounted for 29.57%. In terms of age distribution, 43.58% were aged 40–50 years, followed by 31.52% over 50 years and 24.90% between 30–40 years. Length of service as Echelon III officials varied, with 52.92% serving 1–5 years, 21.40% serving 6–10 years, and 25.68% having more than 10 years of experience. In terms of rank, most respondents held the Penata Tingkat I (III/d) rank (61.48%), followed by Pembina Tingkat I (IV/b) (20.23%), Pembina (IV/a) (15.56%), Pembina Utama Muda (IV/c) (1.56%), and Pembina Utama Madya (IV/d) (1.17%). Regarding competency in BMN management, 92.61% of respondents had received BMN-related training, while 7.39% had not. The most common sources of BMN knowledge were webinars (38.24%), training (26.47%), and a combination of both (13.03%). Overall, the sample composition reflects a proportionally distributed and diverse representation of BMN management across ministries and agencies in West Java Province.

3.3. Measurement Items

Organizational commitment in this study was defined as the psychological state of human resources (HR) reflecting belief, trust, and acceptance of organizational goals and values, including the willingness to work for and remain within the organization (Steers, 1977; Buchanan, 1974; Sulistiawati, 2016; Meyer and Allen, 1991). Human resource competence was defined as individual abilities, skills, and knowledge that form core characteristics, measured through educational background, work experience, technical expertise, capability, and job appreciation (Axley, 2008; Al Marzooqi *et al.*, 2019; Ekayanti *et al.*, 2018).

Budget availability was defined as the financial resources allocated from the State Budget (APBN) to support asset maintenance and development, measured based on funding sources, allocation, and management mechanisms (Idris and Konadi, 2012). The Internal Control System was defined as a process influenced by all organizational components to ensure goal achievement, encompassing the control environment, risk assessment, control activities, information and communication, and monitoring (COSO, 1994; Le and Tran, 2018).

Meanwhile, the Asset Management Information System refers to applications managing asset data, including type, value, managing institution, regulations, and development potential, aiming to provide accurate information for optimal asset planning and management (Sulistiawati, 2016; Aslan, 2014).

BMN management performance is measured by the extent to which state assets contribute to public service efficiency, evaluated through public interest, social impact, stakeholder satisfaction, financial feasibility, technical condition, and future asset utilization potential (AAMCoG, 2008; Attwater *et al.*, 2014; Kaganova and Telgarsky, 2018; Kishk *et al.*, 2005; Varcoe, 2002). Evaluating BMN performance is a critical element in ensuring effectiveness, efficiency, and accountability in state asset management, supporting the quality of public services provided to society.

4. Results

4.1. Data Analysis

The results of the descriptive analysis indicate that respondents demonstrate strong organizational commitment, reflected in confidence and acceptance of organizational goals, with an average score of 4.48, falling between the “agree” and “strongly agree” categories. The highest-scoring indicator is acceptance of organizational goals and willingness to work hard, with a mean score of 4.61. This finding aligns with previous research showing that organizational commitment has a positive and significant relationship with organizational performance, where higher commitment enhances overall effectiveness (Dafiq and Solihat, 2023).

Human resource competence, as a key factor in asset management, recorded an average score of 4.48, with indicators such as diligence and service orientation achieving the highest score of 4.67. This suggests that work unit leaders possess a high level of competence in managing state-owned assets (BMN). Previous studies support this finding, indicating that employee competence significantly influences performance, particularly when combined with job satisfaction and organizational commitment (Janah *et al.*, 2023).

Budget availability recorded an average score of 4.27, with the highest indicator being budget management capability (4.40), indicating that budget allocation for BMN management is carried out transparently and in accordance with planning. Previous research found that budget participation is closely related to managerial performance, with organizational commitment acting as a mediating factor in budget management effectiveness (Paryati, 2021).

The Internal Control System recorded an average score of 4.50, with the control environment as the highest-rated indicator at 4.63, indicating that organizations have implemented ethical standards and performance evaluations in asset management. Previous studies indicate that internal control systems significantly affect managerial performance, although their effectiveness may be influenced by environmental uncertainty (Zakiah *et al.*, 2024).

The Asset Management Information System recorded the highest overall score among all variables, with an average of 4.57, and system integration achieving the highest indicator score at 4.63. This indicates that the use of information technology in BMN management has been well implemented and supports data-driven decision-making. Prior research on asset management highlights the importance of strategic information management in improving organizational performance (Maletić *et al.*, 2020).

BMN management performance, as the dependent variable, recorded an average score of 4.32, with the public purpose indicator achieving the highest score at 4.58, indicating that BMN has been utilized to support organizational functions. Previous research found that organizational commitment positively influences individual performance in the public sector, where higher commitment leads to improved employee productivity (Sabir *et al.*, 2021).

Overall, these results indicate that work unit leaders have a positive perception of the factors influencing BMN management performance, with the Asset Management Information System and the control environment of the Internal Control System emerging as the most prominent contributors to improving state asset management effectiveness.

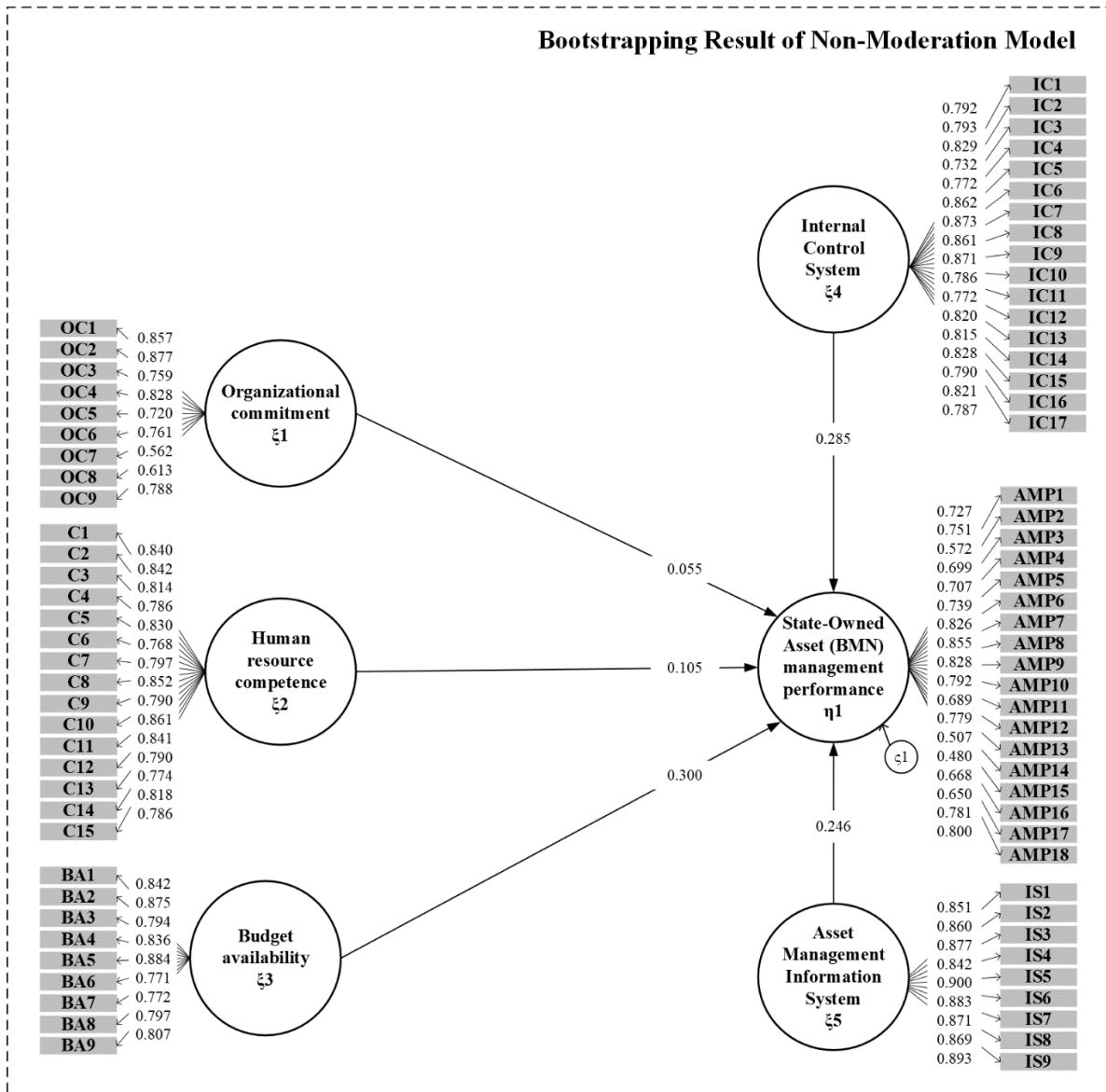
4.2. Evaluation of SEM-PLS Model Criteria

The measurement (outer) model was assessed to determine whether each indicator adequately measured its corresponding construct. Convergent validity was evaluated using factor loadings, with all indicators exceeding the threshold of 0.70, indicating a strong contribution to their respective constructs (Hair *et al.*, 2019). In addition, the Average Variance Extracted (AVE) values for all constructs were above the recommended threshold of 0.50, indicating that more than half of the variance of each indicator was explained by its construct. Indicators with factor loadings below 0.50 were removed to improve the quality of the measurement model, resulting in a more reliable and valid model.

Discriminant validity was assessed using cross-loadings and the Fornell–Larcker criterion. The cross-loading results showed that each indicator was more strongly associated with its corresponding construct than with other constructs, indicating adequate discriminant validity (Henseler *et al.*, 2015). To further confirm these results, the Heterotrait–Monotrait (HTMT) ratio was examined. The HTMT values for all construct pairs were below 0.85, confirming that the model achieved a satisfactory level of discriminant validity.

The reliability of the constructs was assessed using Cronbach’s Alpha (CA) and Composite Reliability (CR), with all constructs exceeding the threshold of 0.70, indicating high internal consistency in the measurement model (Henseler *et al.*, 2015). Reliability improved after the removal of low-loading indicators, suggesting that the measurement model met the required robustness and was suitable for further analysis.

After validating the outer model, the inner model was evaluated to examine the relationships among constructs and the predictive capability of the structural model. Multicollinearity was assessed using the variance inflation factor (VIF), with most constructs showing values below the threshold of 5, indicating no multicollinearity issues (Hair *et al.*, 2012). However, organizational commitment and BMN management performance showed a VIF value of 6.082, which slightly exceeds the recommended threshold. Previous studies suggest that VIF values above 10 are generally considered problematic (Narimawati *et al.*, 2020); therefore, the observed value is still within an acceptable range.



R-square analysis indicates that the endogenous variable in this study is well explained by the exogenous variables. In the model without moderation (Figure 3), the R² value for BMN management performance is 0.774, indicating that 77.4% of its variance is explained by organizational commitment, human resource competence, and budget availability. After incorporating moderating variables (Figure 4), namely the Internal Control System and the Asset Management Information System, the R² value increases to 0.798.

This increase of 2.4% suggests that the moderated model has slightly higher predictive power, as additional variance in BMN management performance is explained by the interaction effects between independent and moderating variables. These findings support the view that the moderation model provides a more comprehensive explanation of the factors influencing BMN management performance (Sarstedt *et al.*, 2020).

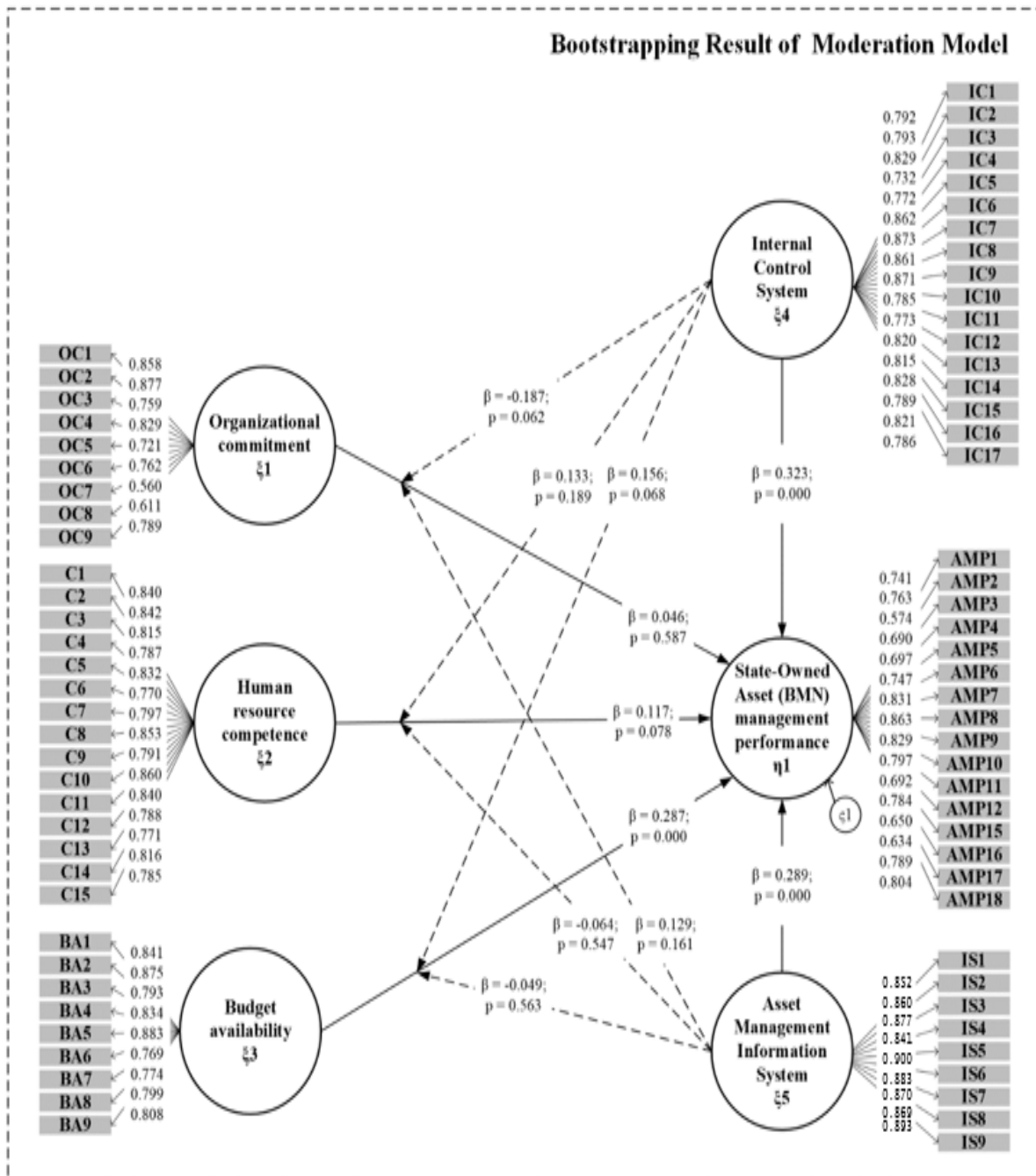


Figure 4. Bootstrapping Results of the Model with Moderation

The predictive relevance (Q^2) results indicate that all constructs have positive values, confirming that the model demonstrates adequate predictive relevance in explaining relationships among variables (Shmueli *et al.*, 2016). PLS-Predict was used to assess the model's predictive performance, and the results show that most indicators have lower Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) values compared to linear regression, indicating better predictive capability. However, certain indicators, such as AMP1, show lower predictive performance and may require further refinement in future research.

The goodness-of-fit (GoF) was evaluated using the Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI). The SRMR value of 0.069 is below the 0.08 threshold, indicating that the model meets the fit criteria (Henseler and Sarstedt, 2013). However, the NFI value of 0.602 is below the commonly suggested benchmark of 0.80. Nevertheless, prior studies indicate that NFI values range between 0 and 1, with values closer to 1 reflecting better model fit (Narimawati *et al.*, 2022). Therefore, while the model shows acceptable fit based on SRMR, the NFI result suggests that there is still room for improvement.

Based on the evaluation of the outer and inner models, the results indicate that the model meets the required testing criteria and is suitable for analyzing relationships among variables. The findings confirm that the model demonstrates acceptable validity, reliability, and explanatory power. Therefore, the model provides a useful framework for understanding BMN management and may serve as a reference for future research and policy considerations.

4.3. Hypothesis Testing

Given the exploratory nature of this study, a significance level of 10% ($p < 0.10$) was adopted for hypothesis testing. This decision was made considering that, in the context of public sector policy, statistical significance is evaluated not only based on theoretical considerations but also on practical relevance, while still accounting for sample size and data variability (Saifuddin, 2005). The path analysis results indicate that not all independent variables have a statistically significant effect on BMN management performance. Organizational commitment ($\beta = 0.046$, $p = 0.555$) does not have a significant effect, indicating that the level of commitment of work unit heads is not directly associated with BMN management performance. Human resource competence ($\beta = 0.117$, $p = 0.073$) shows a positive effect that is statistically significant at the 10% level, although the strength of this relationship is relatively weak, while budget availability ($\beta = 0.287$, $p < 0.001$) has a positive and statistically significant effect. These results suggest that budget availability plays a more substantial role in explaining BMN management performance,

while the effect of human resource competence is present but less robust.

The moderation analysis indicates that the Internal Control System shows a moderating effect on the relationship between independent variables and BMN management performance at the 10% significance level. Specifically, the interaction between budget availability and the Internal Control System ($\beta = 0.156, p = 0.061$) and between organizational commitment and the Internal Control System ($\beta = -0.187, p = 0.062$) are statistically significant, although the strength of these effects is relatively limited. In contrast, the interaction with human resource competence ($\beta = 0.133, p = 0.176$) is not statistically significant.

The results also indicate that the Asset Management Information System does not show a statistically significant moderating effect on the relationships between organizational commitment, human resource competence, and budget availability and BMN management performance, as reflected by p-values exceeding 0.10. This suggests that, although the Asset Management Information System supports BMN management processes, its role as a moderating variable is not supported in this model.

In contrast, the direct effects of the Internal Control System ($\beta = 0.323, p = 0.001$) and the Asset Management Information System ($\beta = 0.289, p < 0.001$) on BMN management performance are positive and statistically significant. These findings indicate that the implementation of internal control systems and the use of asset management information systems are associated with higher BMN management performance. Overall, the results suggest that, beyond human resource competence and budget availability, governance mechanisms—particularly internal control systems and information systems—play an important role in improving state asset management performance, primarily through their direct effects rather than as moderating factors.

5. Discussion

This model examines the relationships between organizational commitment, human resource competence, and budget availability and BMN management performance, with the Internal Control System and the Asset Management Information System included as moderating variables. The SEM-PLS results indicate that budget availability has a positive and statistically significant effect, while human resource competence also shows a positive effect that is statistically significant at the 10% level, although the strength of this relationship is relatively weak. In contrast, organizational commitment does not have a statistically significant effect on BMN management performance.

These findings suggest that, although work unit heads may understand and accept organizational goals, organizational commitment alone is not sufficient to improve BMN management performance. Instead, budget availability plays a more substantial role, while the influence of human resource competence is present but less robust. This is consistent with prior studies emphasizing the importance of financial capacity and resource management in supporting asset management outcomes (Jensen and Meckling, 1976; Barney, 1991; Varcoe, 2002).

The moderation analysis indicates that the Internal Control System shows a moderating effect on the relationships between organizational commitment and budget availability and BMN management performance that is statistically significant at the 10% level, although the strength of these effects is relatively limited. However, it does not moderate the relationship between human resource competence and BMN management performance, suggesting that formal control mechanisms may not directly strengthen the effect of competence and may in some cases, limit flexibility in asset management processes (Sundaramurthy, 2003; Ismail *et al.*, 2019).

In contrast, the Asset Management Information System does not show a statistically significant moderating effect on the relationships examined, as indicated by p-values exceeding 0.10. However, it has a positive and statistically significant direct effect on BMN management performance, indicating that its contribution is more evident in directly supporting asset management processes rather than strengthening the relationships between other variables. This finding contrasts with previous studies that emphasize the importance of comprehensive information systems in supporting asset optimization decisions (Rymarzak and Trojanowski, 2013; Grubišić *et al.*, 2009).

Overall, the findings suggest that budget availability plays a significant role in BMN management performance, while the effect of human resource competence is present but less robust. The Internal Control System contributes by supporting the effectiveness of budget management and organizational commitment, although its moderating effects remain limited, whereas the Asset Management Information System contributes primarily through its direct effect. These results highlight the need to further improve the effectiveness and integration of the Asset Management Information System in BMN management processes to enhance its contribution to asset management performance.

6. Conclusion

The results confirm that the structural equation model used in this study effectively explains the significant impact of human resource competence and budget availability on BMN management performance, whereas organizational commitment does not show a significant effect. The moderation effect of the Internal Control System is only significant in the relationship between organizational commitment and budget availability with BMN performance, while the moderation effect of the Asset Management Information System is not significant in the inter-variable relationships.

These findings highlight that the Internal Control System plays a crucial role in reinforcing the impact of organizational commitment on BMN performance, indicating that without effective oversight mechanisms, organizational commitment alone is insufficient to improve performance. Furthermore, the Asset Management Information System functions more as a direct predictor that enhances BMN management performance rather than a moderating variable influencing the relationships between exogenous variables. This study contributes to the validation of agency theory and resource-based theory in the context of public asset management. It confirms that human resource competence and budget availability are strategic resources that support BMN management effectiveness, aligning with resource-based theory principles that emphasize the importance of organizational resource quality in achieving goals. Additionally, this research strengthens the understanding of principal-agent relationships in the public sector, where differences in information and understanding between ministries as principals and work units as agents can influence state asset management effectiveness. From a practical perspective, these findings provide insights for work unit heads to improve BMN management effectiveness by strengthening the Internal Control System and optimizing the use of the Asset Management Information System.

However, this study has several limitations. First, the data reflect conditions at the time of the research, meaning that the relevance of the findings may change over time, particularly in response to policy shifts and evolving organizational dynamics in the public sector. Second, this study employed a quantitative survey approach, which may introduce respondent bias, especially as most questionnaires were distributed online.

Future research may consider adopting a mixed-method or longitudinal approach to capture changes in BMN management over time. In addition, future studies could examine other factors, such as organizational culture, leadership style, and regulatory conditions, to provide a more comprehensive understanding of their influence on public asset management performance.

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