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Article

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Factors influencing non-tax revenue sustainability in Indonesian government institutions: the mediating role of accountability

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ABSTRACT

Non-tax revenue (NTR) is a source of national revenue that has significantly grown over the last two decades in Indonesia. Apart from the achievement of NTR in the national budget which shows a positive trend, there are still accountability issues that were disclosed by the Supreme Audit Agency in the audit findings of the central government's financial reports. This study aims to analyze the factors that promote the sustainability of NTR as potential central government revenue by placing accountability as a mediating variable. This quantitative research uses a survey approach to collect data by distributing questionnaires across central government institutions. Respondents who are the object of research are civil servants who work in State Ministries/Institutions with certain criteria. The data collected for this study were 353 respondents, mainly from the 20 national government agencies that were the largest NTR generators in the last three years. The partial Least Square-Structural Equation Modeling (PLS-SEM) was utilized to analyze the data. The results of the study show that government internal control and accountability have proven to be favorable for creating NTR sustainability. Accountability is an effective mediating factor for sustainable leadership and human resource (HR) competencies in supporting the strengthening of NTR sustainability. This research provides policy implications for central government institutions to strengthen accountability by internalizing accountability principles in NTR management, enhancing the internal control level, and formulating talent management for better government officer promotion design

IMPACT STATEMENT

This research explores factors influencing non-tax revenue sustainability across Line Ministries and Agencies in Indonesia by incorporating accountability as a mediating variable in our model. The study also develops new measurements of sustainability and accountability within a non-tax revenue context. Findings provide that government internal control directly influences non-tax revenue sustainability. Meanwhile, sustainability leadership and human resource competency affect non-tax revenue sustainability through accountability. Our research reveals that non-tax revenue accountability matters in explaining non-tax revenue sustainability. This research proposes a new measurement of non-tax revenue sustainability by adding three dimensions, namely strategic planning, spending management, and budgeting performance quality. The measurement is proven better than the old model recommended by International Public Sector Accounting Boards (2013). The study also indicates that a new measurement for non-tax revenue accountability is more robust than Han and Perry's (2019) model, by incorporating two dimensions, of political and spiritual aspects. Our research provides insights for central government institutions to maintain individual accountability to promote non-tax revenue sustainability for better national budget quality.

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1. Introduction

Accountability and organizational performance are issues often debated in public policy research (Han & Hong, 2019). Accountability is seen as an important factor in driving public sector effectiveness. Employee views on accountability also affect their performance (R. C. Dewi & Riantoputra, 2019). In the governance of non-profit organizations, accountability is very important (Tacon et al., 2017). However, research examining the relationship between accountability and public sector performance is still rarely conducted (Han & Hong, 2019). Public sector accountability is also an issue that has not been raised much in research in Indonesia (Rizky & Setiawan, 2019). One of the important public sector issues to observe in Indonesia is the association between accountability and performance in non-tax revenue (NTR) across line ministries and agencies (LMAs).

Accountability and performance within the NTR context in Indonesia are not always moving together in the same direction. Notably, there are still some accountability issues in NTR management across LMA. Based on BPK's Audit Reports (LHP) in the last 7 years, there have been some non-compliance findings in the field of NTR for many years in numerous national government organizations (LMA). The number of LMAs that commit these violations and their nominal value varies from year to year. In principle, the audit findings of non-compliance with laws and regulations in the field of NTR can be grouped into several categories, such as NTR is not collected, NTR is late/non-paid, NTR is used directly or NTR is collected without a legal basis and other issues. The audit findings in question are one of the obstacles in efforts to optimize NTR. Dinarjito (2017a) argues that the current optimization efforts are more likely to increase the achievement of NTR realization, but on the other hand, their management has not received more attention, especially for LMA that collect or provide NTR services. Thus, the linkage between the quality of NTR management according to the corridor of statutory provisions becomes important in terms of its impact on the performance of LMA in optimizing the NTR target.

The fact that accountability is not in line with the performance of NTR achievements is contrary to the argument Han and Hong (2019) which states that accountability is important in encouraging organizational effectiveness. The NTR realization progress which continues to improve despite problems in NTR management also contradicts the research results of Sarwasusila et al., (2021) which found that the effectiveness of NTR management drives the financial performance of government agencies. Based on this phenomenon, in-depth observation of the impact of accountability on NTR management performance is essential. Whether NTR accountability is meaningful for NTR sustainability is one of key concerns in this research.

This study aims to analyze factors influencing NTR sustainability (as an organization performance indicator) and the role of accountability as a mediating variable. This research also develops new measurement for NTR sustainability and NTR accountability which were not extensively discussed in prior works. Consequently, this current study provides following contributions to the existing literature.

First, this research makes a bridge gap in the NTR sustainability literature which is still rare discussed before. Previous studies have focused more on macro aspects and has not paid much attention to the sustainability of NTR at the micro level. NTR sustainability determinants are still limited to discussion in prior studies. We can find studies on the sustainability of state revenues in the last ten years, among others, in research that discusses the relationship between state income and spending (P.-F. Chen, 2016; Dada, 2013; Kurniawan, 2015), regional income sustainability (Ajadi et al., 2020; Muda et al., 2017), fiscal sustainability during the Great Depression (Mahdavi, 2014), support for transparency and accountability for regional financial sustainability (Ferry & Murphy, 2018), and government debt sustainability (Ghosh et al., 2013; Maebayashi & Konishi, 2021). Research observing the sustainability of NTR as an indicator of the performance of central government organizations is a research gap that can be filled to make new contributions to scientific development.

Second, in terms of the role of accountability variables, many researchers have attempted to reveal several variables that are thought to be determinants of the level of accountability, although not all of them have used the individual/employee level accountability approach. The factors found by these researchers included the accounting system (Sattu et al., 2020), human resources competence and leadership (Yusar & Mulyani, 2020), social-culture (Simpson et al., 2020), internal control and leadership

(Alam et al., 2019), ethical leadership and collaboration (Rachmawati & Salendu, 2022), transparency (López & Fontaine, 2019), ethical leadership (White & Rezanía, 2019), regulation or administration (Nirwana & Haliah, 2018), internal audit and utilization of information technology (Mardinan et al., 2018), governance (Gunawan, Hamming, Zakaria, & Djamareng, 2017; Irvan et al., 2017; Tiwari, 2017). This primary data research was conducted using various methods such as surveys, interviews, and case studies using respondents who were Civil Servants (PNS) at the central and regional levels. However, none of these various studies have specifically observed the level of accountability for NTR management at the individual employee level in government work units. Our second contribution is dealing with the development of NTR accountability measurement by using employee level approach by adopting study Han and Perry (2019). In their study, Han and Perry (2019) promoted sub-sequent research to develop their model and implement in the context of developing countries or public sector organization.

Third, when analyzing the determinants of NTR accountability, this research also seeks to reveal the impact of the several variables above and the NTR accountability variables on NTR sustainability. The significant contribution of NTR to the APBN in recent years is interesting to look at closely regarding the characteristics of the managing organization at the micro level. Various studies have revealed various consequences and impacts of accountability on organizational performance. Several of these studies reveal the factors that have influenced accountability so far related to organizational characteristics such as leadership, human resources, information technology, and internal control (Aleksandrov et al., 2020; Gunawan, Hamming, Zakaria, Djamareng, et al., 2017; Han, 2020; Hwang, 2013; Irvan et al., 2017; Jantz et al., 2015; Khafid & Nurlaili, 2017; Nirwana & Haliah, 2018; Sattu et al., 2020). However, none of the aforementioned works of literature have specifically revealed the influence of organizational characteristics on the accountability and sustainability of state revenues.

This study aims to investigate the influence of sustainable leadership, HR competencies, information systems, and internal controls on NTR accountability. In previous research, there has not been much specific testing of these four variables on NTR accountability. Previous studies have examined the impact of several variables on organizational accountability in general, such as Lee (2017) and Suriyankietkaew & Avery (2016), other variables on public sector organizational accountability. In addition, this study places NTR accountability as a mediating variable in examining the impact of sustainable leadership, HR competencies, information systems, and internal control on the sustainability of NTR. Research that places accountability as a mediating variable, among others, can be found in previous studies, namely private employee accountability (Kang et al., 2022) university accountability (Muktiadji et al., 2020); accountability of local government civil servants (Silalahi & Sinambela, 2017); and perceptions of student accountability (White & Rezanía, 2019), but no one has looked at NTR accountability specifically.

Fourth, an important and essential contribution in current study is the development of NTR sustainability indicators that have never existed before. This issue is closely related to fiscal sustainability in the APBN structure. Measuring fiscal sustainability includes looking at debt capacity. Meanwhile, in terms of NTR sustainability, debt capacity is considered less relevant. This is because the NTR management agency (LMA) cannot withdraw loans like the central or regional government. Therefore, this research proposes the addition of three dimensions, namely strategic planning (proposed by León, 2001), expenditure management (mandated by NTR law), and budgeting performance (stipulated by public finance law), as substitutes for debt capacity. These three additional dimensions are considered essential elements in NTR management.

Finally, our meaningful contribution and the next novelty in this research is to develop a measurement of NTR accountability by looking at the five dimensions developed by Han & Perry (2019) and combining them with NTR accountability indicators in the statutory provisions in the field of NTR (Law Number 9 of 2018). Apart from these five dimensions, measuring accountability also looks at two other dimensions, namely political and spiritual. Achilli et al., (2021) argue that spirituality is an important element in accountability. Meanwhile, Baykurt (2022) stated the importance of considering political aspects in assessing government accountability. NTR accountability is measured through observations of individuals (felt accountability or employee accountability).

The measurement of the NTR sustainability variable will be seen from the direct and indirect influence of the determining factors. Meanwhile, the determinants of NTR accountability are expected to provide a new perspective regarding the causes of NTR management violations which have always

been the main audit findings of central government financial reporting. Furthermore, empirical evidence regarding the determinants of NTR sustainability is expected to provide an important contribution to the development of research on NTR management, which is still limited in established literatures.

To achieve our research objectives, our study conduct survey by distributing questionnaires to selected respondents across LMAs. The respondents must meet a number of criteria such as education background, years of experience both as government officers or assigned in NTR field, and also must work in certain LMAs. We would like to ensure that our respondents are public servants who have very good knowledge and experience regarding NTR issues.

This study is presented as follows: [Section 2](#) discuss the paper's background, explaining why this research context is important. [Section 3](#) provides the theoretical framework for our research. Literature review and hypothesis development will be discussed in [Section 4](#). The next structure is [Section 5](#) which introduces the research design. [Section 6](#) then explores the empirical findings and analysis. Finally, we summarize the results, contributions, and implications in [Section 7](#).

2. Background

Public sector accountability Indonesia is an interesting and long-standing debate in current literature. This study is valuable for budget policy makers because government revenue enhancement efforts are always facing non-compliance issues (Abdul Wahab et al., 2018). However, established literature has paid little attention to discuss the topic regarding NTR across LMAs. The fruitful of this topic can be elaborated in the following explanation

Firstly, NTR is a component of central government revenue in the National Budget (APBN) whose existence is increasingly important (Dinarjito, 2017b). The essence of NTR in the APBN, among others, can be seen from its performance which has consistently grown in the last two decades. Since 2005, the realization of NTR has always been above IDR 100 trillion with an average growth of 10.5 percent in the 2005-2019 period (Wibowo et al., 2021). We can see the increasingly encouraging contribution of NTR in the APBN can be viewed from various aspects. The Ministry of Finance of the Republic of Indonesia (MoF) reported that in terms of target achievement, the realization of NTR has always exceeded the target set in the APBN in the last ten years. This shows that NTR still has considerable potential to be explored in the future with a growth positive trend (Pramugar & Sinaga, 2021). The favorability of NTR in APBN is not only in the target performance itself but also in the growth of NTR by objects or revenue sources. Despite that natural resources revenue has dominated the NTR proportion for decades, other sources of NTR such as mandatory public service provision (such as revenue from driver's licenses and passport services), government asset utilization, and quasi-public goods served by government agents (such as educational and health services) have shown a significant rise. Moreover, NTR performance can be highlighted from a revenue contributor perspective. In light of this, we may say that at least 95 percent of NTR realization has been generated by twenty line ministries and agencies in the last five years.

Secondly, NTR plays a role in governing various sectoral policies through the regulatory function, especially to boost the economy, increase investment, and strengthen competitiveness (M. of F. Republik Indonesia, 2020). This is also in line with the concept of new public management (NPM) which implies the need for government organizations to adopt the best managerial practices from the private sector to produce the best performance for the organization. The performance measurement of NTR management is feasible to be developed as a basis for evaluating the performance of government agencies that manage NTR. Performance indicators for NTR can be used as a measure of fiscal sustainability because NTR is an important part of the APBN. Fiscal sustainability in the NTR sector can be considered a measure of the performance of NTR management because it does not only look at the income aspect but also the service aspect which is the identity of NTR.

Thirdly, NTR achievement is becoming one of the indicators of the central government agencies' performance. In recent years, the increasingly overwhelming performance of NTR has been coherent with the increasingly improved quality of financial reports issued by line ministries/agencies (LMA). Financial reports are seen as a mechanism for public accountability (Rutherford, 2000). Accountability at the level of central government agencies is often seen in the quality of the financial reports they

prepare. In this case, public accountability is the provision of information and disclosure of government financial activities and performance to parties with an interest in financial reports (Mardiasmo, 2009). From the government side, bureaucrats are expected and assumed to be responsible for their actions and performance to the public and different organizations (Paudel & Gupta, 2019). In addition, in the era of democracy, because people want to control the actions of public officials, they (or their representatives) make these officials have to answer, explain, and be able to accept sanctions (Mulgan, 2000).

In line with the government's efforts to continue to improve accountability, the Indonesian Supreme Auditor (BPK)'s audit opinion on LMA has improved significantly. Since the accrual basis was fully implemented in numerous LMA starting FY 2015, the number of LMA granting unqualified opinions has increased from 65.1% in 2015 to 97.7% in 2020, although it decreased slightly at level 95.4% in 2021. On the other hand, LMA receiving disclaimer opinions have also decreased to the point that there are no more LMA gaining disclaimer opinions since 2020. The improved opinion of LMA's financial reporting indicates an enhancement in the quality of financial reports and reflects an increase in the accountability of state financial management at the organizational level.

3. Theoretical literature review

3.1. *New public management (NPM) in the NTR context*

The NPM concept developed as a government effort to apply management principles in the private sector to strengthen public services (Hood, 1991). The term NPM, which was introduced by Hood (1991), was further developed by Osborne and Gaebler in 1992 (Gaus et al., 2017) with the term reinventing government. This concept has been successfully implemented in several developed countries such as New Zealand, England, and Australia although it has not been completely replicated in several other developed countries such as America and Canada (Singh & Slack, 2022). This theory developed along with the reform process in the public sector. The urge for rulers to apply managerial principles that adhere to the principle of efficiency and abandon an inflexible work culture is the essence of NPM.

This NPM doctrine is, among other things, what encourages the Indonesian Government to carry out bureaucratic reform, although, in practice, it needs to be adapted to the Indonesian context (Gaus et al., 2017). Bureaucratic reform is a necessity in developing countries as an effort to realize good governance (Rajib et al., 2019). In addition, government organizations are public entities whose main funding comes from the government budget, so accountability demands are something that must be fulfilled (Tran et al., 2020).

The NPM concept is a multi-dimensional concept (Hood, 1995), therefore it involves several theories. One relevant theory is agency theory as introduced by Jensen & Meckling, (1976). The NPM concept is a good approach to understanding agency theory in the public sector (Tran et al., 2020). One of the characteristics of NPM is the formation of an autonomous body in the public sector which is relatively necessary to realize tiered accountability to echelon units above (Kalimullah et al., 2012). Agency theory in the public sector is relevant considering that bureaucrats who are entrusted with running the wheels of government must explain the performance they have achieved to the public through members of parliament. Explanation of performance is one of the core concepts of NPM. The NPM doctrine which emphasizes performance measurement makes agency theory important to apply in the public sector. As parties are given a mandate by the people (agents), bureaucrats may have different incentives from the public as the principal party. The government is obliged to be accountable for the performance of public service delivery as an embodiment of one of the principles of good governance, namely accountability.

In line with the process of continuous bureaucratic reform, the NPM concept is relevant in increasing the accountability of NTR management. Central government institutions (LMA) as NTR collector agencies are required to continuously improve the quality of public services. This is a form of responsibility of government agencies that have obtained funding allocations from the APBN which are funded from state revenues collected from the public. Officials involved in the public service process are often faced with situations where they must immediately make decisions that may conflict with organizational policies. The emergence of findings that are often disclosed by the BPK in the form of delays in the deposit of NTR and collection of NTR without a legal basis, is a form of discretion from officials that is not in

line with the norms of NTR management. Therefore, the NPM concept is important in analyzing NTR accountability practices. The better the Ministries/Institutions apply the NPM principle, the better the agency's performance will be in realizing the NTR target as one of the government's performance parameters. This NPM is also relevant in explaining why Public Service Agency (BLU) is a government agency, expected to be able to practice as a private entity. The application of NPM by BLU will greatly support the BLU organization in carrying out its mission as a special vehicle for ministries/agencies as NTR managers.

3.2. Stakeholders theory

Stakeholders theory generally states that managers must make decisions by considering the interests of all stakeholders (Baumfield, 2016; Hörisch et al., 2020). This theory was previously introduced by Freeman (1984) and Parmar et al. (2010). Stakeholders are defined as any individual or group that can influence or be influenced by an organization (Freeman, 1984, p. 46). This theory can explain how the relationship between organizations and society can influence accountability in the public sector (Dhanani & Connolly, 2012).

Stakeholders in the context of NTR management are quite diverse. At the micro level, each government officer who is in charge of managing NTR must pay attention to the interests of various stakeholders. Internal stakeholders come from direct supervisors, heads of offices, and colleagues/colleagues. Public servant who is in handling NTR management must be able to divide their time and attention to fulfill all their interests. Internal stakeholders usually want quick completion of work and continuous innovation or improvement of business processes.

On the other hand, NTR management bureaucrats are also faced with the interests of external stakeholders, including the public who use NTR services, the Ministry of Finance as the NTR regulator, and the supreme auditor as the external auditor. All of these stakeholders have different needs from each other, so they require alertness from every government employee who has the mandate to manage NTR. The community wants efficient NTR services at an affordable cost. The Ministry of Finance requests that all NTR management agencies pay attention to all provisions regulated in the NTR Law, including the provision of sanctions for government employees who violate the regulations. The supreme auditor wants audit recommendations to have serious attention from all NTR management agencies to be followed up and reported regularly.

In line with other research on factors that contribute to accountability in the public sector, this research focuses on internal organizational resources such as leadership, human resource competency, internal control, and the use of information technology in increasing accountability in NTR management within LMA.

An organization must maintain relationships with its stakeholders by disclosing information to stakeholders and accommodating their needs and desires. When associated with public entities, the government is likened to a company that operates with attention to the benefits that will be provided to the community as stakeholders. These stakeholders put pressure on public sector organizations, among others, to always uphold ethics (Avery et al., 2011). The government must provide financial management information and accommodate the needs and desires of stakeholders. NTR management has two aspects, namely service and fiscal. Stakeholder theory emphasizes the need for NTR management agencies to provide excellent services to the community and optimize NTR revenues from the services they provide to meet NTR targets approved by the legislative.

3.3. NTR policy and sustainability concept

Economic growth achievement with sustainability has become one of strategic issues among G-7 countries (Doğan et al., 2022). NTR as a part of economic stimulus in Indonesia needs to be paid attention more seriously to support its existence in the future. The NTR management aspect is closely related to fees to the public for goods and services and is based on statutory provisions. NTR reform began with the emergence of Law Number 20 of 1997 which for more than twenty years inspired the birth of

various NTR management norms. One of the interesting norms in Law 20/1997 is that government agencies that collect NTR can use some of the funds to carry out activities related to NTR collections. This provision is emphasized and clarified in Law Number 9 of 2018 which is a replacement law for Law 20/1997. In the provisions of Article 33, it is stated that the use of part of the NTR funds can be proposed by Ministries/Institutions for carrying out NTR management and/or improving the quality of NTR management, other activities; and/or optimization of NTR. The Minister of Finance gives approval or rejection to the proposal by considering the state's financial condition, fiscal policy, and LMA's funding needs. In this case, what is meant by LMA's funding needs is the funding needs of LMA as the NTR management agency for NTR services as the main priority.

Literature on public finance and public choice shows that government bureaucracy is inefficient because bureaucrats can exploit their monopoly position to force citizens as consumers into the demand curve with a scheme of charging everything to citizens or being released altogether (Sun & Jung, 2012). In contrast to managers in the private sector who can maximize corporate profits, bureaucrats cannot profit from any profits their organizations may generate. In practice, NTR management can provide financial benefits for some bureaucrats. This is possible because of the existence of a permit mechanism for the use of part of the NTR funds collected by LMA. The use of these funds can be in the form of purchasing goods that provide incentives for some employees involved in managing NTR.

An alternative view of bureaucratic behavior is the theory of 'fiscal illusion' (Sun & Jung, 2012). This theory suggests that when government revenues are unobserved or not fully observed by taxpayers, government costs are perceived to be cheaper than they are. Thus, from a politician's perspective, the existence of fiscal illusions allows politicians to choose revenue mechanisms that maximize the extent to which spending can be increased without attracting public attention. Meanwhile, at the same time, this kind of revenue mechanism will tend to encourage consumption that is greater than the taxpayer's optimal point by hiding the facts about the actual costs of public services (Wagner, 1976 in Sun 2009).

NTR management in Indonesia has experienced dynamic changes. At least, we have gone through three reforms in the NTR sector (Wibowo et al., 2021). Reform of NTR management began with the presence of Law Number 20 of 1997 concerning NTR. This law is considered the initial foundation for NTR reform in subsequent years. An important principle campaigned for in Law Number 20 of 1997 is that all state revenues outside of taxes are essentially Non-Tax State Revenues (NTR). This was intended to encourage Departmental and Non-Departmental leaders at that time (now LMA) not to carry out their management of state revenues obtained from the implementation of their duties and functions. In return, some of the funds deposited as NTR into the state treasury can be requested back by the government agency managing NTR to the Ministry of Finance as the agency carrying out duties as state general treasurer.

The second phase of NTR reform was marked by the issuance of a package of laws in the field of state finance. In Law Number 17 of 2003, the term NTR was introduced with the term non-tax revenue and became one of three groups of state income in the APBN besides taxation and grants. Furthermore, the state finance law also regulates generally who has the authority to carry out NTR management. Furthermore, Law Number 1 of 2004 concerning State Treasury introduced the term BLU which would later become the *prima donna* entity for central and regional agencies in adopting the principles of service efficiency, as predicted in the NPM concept.

We can find the meaning of fiscal sustainability in some pieces of literature with very diverse explanations. There are at least two big concepts in fiscal sustainability, namely related to solvency ratio and inter-temporal budget (Malito, 2014). Fiscal sustainability is also often associated with several perspectives such as the government debt burden that must be borne (Blanchard, 1990; Domar, 1944; IMF, 2002; OECD, 2009), the ability to maintain wealth (Buiter et al., 1985), and the ability to provide services and funding commitments (IPSASB, 2013). The most basic definition of fiscal sustainability is balanced public finances, where the government covers its expenditure from its revenues while reducing its dependence on loans and borrowings (Bird, 2003). Efforts to maintain fiscal sustainability depend on the availability of accurate information about past and future revenues and expenditures. In other words, the government needs to clearly define accountability and establish financial management practices to enforce these rules (Gooptu, 2005). In this context, financial sustainability can be defined also as the

government's ability to provide services today without compromising its ability to do so in the future, and it is a broader concept consisting of three interrelated dimensions: services, revenues, and debt (Rodríguez Bolívar et al., 2018).

Fiscal sustainability according to the Indonesian Government is defined as the government's ability to maintain state finances in a credible position and be able to provide services to the community in the long term, by paying attention to expenditure and income policy factors, taking into account debt repayment costs and socio-economic and environmental factors in the future (BPK Republik Indonesia, 2021). This definition is in line with the concept of fiscal sustainability which prioritizes a long-term perspective ((Rodríguez Bolívar et al., 2018); (IPSASB, 2013)). It was also reported that international attention regarding the disclosure of long-term fiscal sustainability reports is increasing. This can be seen from the tendency for many to start implementing and publishing long-term fiscal sustainability reports which are supported by provisions set by their governments. For example, Australia publishes long-term fiscal sustainability reports periodically every 3 years with a time horizon of 40 years (BPK Republik Indonesia, 2021).

In line with the development of the definition of fiscal sustainability above, several researchers have also discussed a plenty of fiscal sustainability indicators. Sustainable public finance indicators have gained great relevance over the last decade, especially during the global crisis in 2008 (Malito, 2014). According to him, these indicators are often grouped into 2 large poles, namely budget constraints and sustainability thresholds. The ratio developed concerning budget constraints is the ratio of debt to macroeconomic indicators such as the ratio of gross domestic product and the ratio of gross national income. The indicators related to the fiscal sustainability threshold are usually described in terms of fiscal distress, debt compliance risk, and aging-induced fiscal risk.

Meanwhile, León (2001) equates fiscal sustainability with financial sustainability. The realization of financial sustainability in an organization or entity there are 4 pillars, namely: strategic and financial planning, income diversification, good administration and finance, and creating own income. Fiscal sustainability indicators are developed to identify a comprehensive set of measures for institutional development that are relevant to an organization's financial sustainability (Munford, 2020). There are 12 indicators divided into 4 dimensions (León, 2001) to show fiscal sustainability, namely leadership and strategic vision (3 indicators), ability to earn income (3 indicators), and financial administration capacity (6 indicators).

On the other hand, IPSASB (2013) states that long-term financial sustainability should provide information on three interrelated dimensions, namely income, services, and debt. These three dimensions are related to continuity over time, namely focusing efforts on the need to provide public services to balance the financial resources obtained with the consumption of resources or service costs (Pezzey et al., 2002). Meanwhile, several other references use financial report information to calculate several ratios as a measure of financial sustainability, namely operating surplus/deficit, rates coverage, sustainability ratio, current ratio, and interest coverage (PwC, 2006). Fiscal sustainability indicators that rely solely on financial report information have weaknesses because financial reports contain historical value (Subires & Bolívar, 2017). The dimensions of fiscal sustainability according to IPSASB (2013) in the Recommended Practice Guideline include services, income, and debt. Fiscal sustainability is formed when the entity can meet the needs of public services without increasing tax levies or incurring debt. Conversely, if the fulfillment of public services is carried out by increasing tax revenue and increasing debt, fiscal unsustainability is created (IPSASB 2013).

Several authors tried to develop various measurements for fiscal or financial sustainability. Previous researchers developed measures of fiscal sustainability of a country or local government, many using macroeconomic indicators (such as Nations, (2001) and Worldbank (2005), financial report information such as suggested by Rodríguez Bolívar et al., (2018) and Muda et al., (2017)) and mixed data between financial and non-financial (IPSASB, 2013; León, 2001). There are no indicators mentioned above that specifically discuss the measurement of NTR sustainability. In the context of the sustainability of NTR for government institutions, macroeconomic measures such as GNI and the percentage of debt to GDP cannot be applied. This is because these data are more macro, while the continuity of NTR at LMA is at the sub macro level

Based on the description above, there is no a single indicator that provides a specific description of the sustainability of NTR. The fiscal sustainability indicators that are considered to be closer to the concept of fiscal sustainability are the indicators introduced by IPSASB (2013). This is because the dimension of fiscal sustainability launched by IPSASB (2013), prioritizes services compared to income and debt. NTR

services should not be created because of additional levies or debts, but are charged according to people's purchasing power with the principle of justice.

Certain services provided by ministries/agencies may be subject to a tariff of Rp.0 or zero percent. This means that as far as possible, public services do not impose additional burdens on the community, except for types of services or permits that are regulatory, such as NTR from the use of natural resources. However, the dimensions of service, income, and debt do not fully describe the sustainability of NTR at government offices. This is because ministries/institutions such as NTR management agencies are budget users who cannot collect debt. In the context of the state finance law, state debt in the form of financing debt can only be paid by the Minister of Finance as the State General Treasurer. Therefore, it is necessary to develop another dimension that can replace the debt dimension to better reflect the sustainability of NTR.

In this study, the dimension of fiscal sustainability offered in the RPG will be applied in the context of NTR management by proposing adjustments to the debt dimension. Entities that manage NTR are ministries/institutions that do not have the authority to withdraw financing loans or long-term debt. Therefore, the dimensions that will be developed as a substitute for debt are the dimensions of strategic planning, spending, and quality of budgeting. These three dimensions are seen as more relevant in explaining the sustainability of NTR because they are directly related to the business processes of NTR management. This is shown, among other things, by the existence of a link between strategic planning, LMA' spending, and quality of budgeting with efforts to optimize NTR by statutory provisions. Also, the three dimensions are relevant to the measurement proposed by León, (2001)

3.4. Felt accountability concept within the NTR framework

Prior studies argue that accountability is a virtue and normative concept (Acheampong et al., 2023). Accountability in principle can be seen from all levels of analysis, namely the organizational level (such as Frink and Klimoski (1998), meso-level (Frink et al., 2016), and multi-level constructs (Lerner & Tetlock, 1999). Research on accountability at the organizational level has been extensive (Olsen, 2013; Schillemans, 2016). Debates in public administration have increased our understanding of accountability at the organizational level, but evidence from studies in the behavioral sciences shows that what individuals feel about accountability, is not always the same (Frink & Klimoski, 1998).

This research will concentrate on micro-level accountability. In particular, the focus of this review will center on the main form of micro-level accountability that has received the most research attention, namely felt accountability. Felt accountability, which is often called simply accountability, refers to an individual's perception of his or her accountability (Frink & Klimoski, 1998).

Measuring NTR accountability is carried out using an employee accountability approach and combined with statutory regulations in the field of NTR and other related laws and regulations. These other regulations include Law Number 25 of 1999 concerning Public Services, Law Number 14 of 2008 concerning Openness of Public Information, Law Number 15 of 2004 Auditing and Accountability for State Financial Management, and Law Number 28 of 1999 concerning State Administration that is Free and Clean from Corruption, Collusion, and Nepotism. Measuring employee accountability refers to a measure previously developed by Han & Perry, (2019) in the form of several statements related to individual feelings. When compared with the indicators put forward by several other researchers such as Hochwarter et al., (2007); Overman et al., (2020); Schillemans et al., (2020), Han & Perry, (2019) measure has advantages. The eight indicators introduced by Hochwarter et al., (2007) are unidimensional factors (Hall et al., 2006). Meanwhile, the eight indicators developed by Overman et al., (2020) are divided into 2 dimensions, namely the legitimacy dimension and the expertise dimension. The nine indicators developed by Schillemans et al., (2020) are divided into three dimensions, namely expected accountability, forum legitimacy, and forum expertise.

The three above studies did not consider the influence of organizational accountability systems on individual accountability as proposed by Han & Perry (2019). Consideration of the influence of the organizational accountability system becomes relevant in this study considering that accountability is positioned as a mediating variable.

The dimensions developed by Han & Perry (2019) can be observed in every stage of NTR management from planning, and implementation, to accountability. The planning aspect is an accountability practice carried out

by public officers before carrying out NTR collection-based services (pre-service). This includes not only the NTR planning process but also matters related to service preparation such as government officers' understanding of the quality of public services and their responsibility to provide the best service or performance. The implementation aspect is a public service practice that collects NTR (within service). The third aspect is matters relating to the recording, reporting, and evaluation of the performance of NTR management carried out by public servants (post-service).

In the conclusion of their research, Han & Perry (2019) argue that the accountability measurement scale they have developed needs to be evaluated for its use in different countries, to obtain a global measure. Moreover, they suggest testing these indicators into the accountability of government and non-profit institutions. Therefore, this study seeks to develop individual accountability indicators using Han & Perry's (2019) dimensions which are adjusted in the context of the NTR framework in Indonesia. Furthermore, NTR accountability indicators were also developed with two other dimensions, namely politics and spirituality. The political dimension is suggested by Baykurt (2022) and Romzek & Dubnick (1987), while spirituality is suggested by Achilli et al., (2021)).

The fourth dimension, the political aspect, is the effort of the NTR management agency to be able to meet the expectations of stakeholders, especially external stakeholders such as the parliament and supreme auditor body (political dimension). The fifth dimension, spirituality is noble values that government employees adhere to following their respective religious beliefs and contain universal values such as hard work and honesty (spirituality dimension). The performance evaluation dimension is an individual performance perspective in the management of NTR which is bound by a performance contract between the bureaucrats and their immediate supervisors (performance evaluation dimension). Accountability indicators developed by Hochwarter et al., (2007a), Overman et al. (2020), and Schillemans et al. (2020), but with the division of dimensions by the context of NTR management mentioned above.

4. Empirical literature review and hypotheses development

4.1. Sustainable leadership and NTR sustainability

Leadership style has an impact on organizational performance. This aligns with the NPM framework where organizational leaders are expected to prioritize output performance over processes. Performance measurement becomes crucial in implementing private sector management principles in government agencies. Positive effects of leadership style on organizational performance can be found in the study by Wardiana & Hermanto (2019) and also N. K. Dewi et al., (2023). In their observation of village performance, Wardiana & Hermanto (2019) discovered that leaders who instill trust and create a positive work atmosphere provide a positive boost to organizational performance. We are familiar with various types and models of leadership. Diverse leadership models have different impacts on organizational performance. In research on the influence of various leadership types on organizational performance, Al Khajeh (2018) revealed that transactional, charismatic, and bureaucratic leadership harm organizational performance. Meanwhile, transformational and democratic leadership models foster a conducive atmosphere to support organizational effectiveness. Autocratic leadership, on the other hand, does not have any impact on entity performance. Therefore, there is still an opportunity to develop other leadership models that may have a positive and consistent long-term impact on government agency performance. The observed leadership style in this research is sustainable leadership.

The sustainable leadership model proposed by Avery et al., (2011) turns out to have a significant impact on achieving the financial performance of business entities. This can be seen in the improved financial performance of small and micro enterprises in Thailand as a result of strengthening sustainable leadership Suriyankietkaew & Avery (2016). The positive influence of sustainable leadership on organizational performance is also evident in the government sector in America, as evidenced by Lee (2017). The concept of sustainable leadership is considered relevant in supporting efforts to achieve long-term government agency performance, such as sustained non-tax revenue (NTR) in the long run. This is because sustainable leadership is not only short-term-oriented but also has a long-term perspective.

Based on the above explanation, the first hypothesis in this research is as follows:

H₁: Sustainable leadership has a positive impact on NTR sustainability.

4.2. Sustainable information system and NTR sustainability

The role of information technology in supporting organizational effectiveness is beyond doubt. This is primarily because the presence of information systems facilitates leaders in making high-quality decisions based on reliable and timely information supply. This ideal condition can be met if the organization possesses a mature and quality information system. The impact of information systems on performance can be observed in studies such as Hasan Al-Mamary et al., (2014). The implementation of information systems in supporting organizational effectiveness is influenced by three elements: technology characteristics, organizational factors, and the organization's personnel.

The role of information systems in state revenue collection performance has been demonstrated in several African countries such as Kenya (Otieno et al., 2013) and Ethiopia (Tiwari, 2017). The use of information technology, especially when utilizing sustainable information system concepts, is expected to introduce a range of applications that facilitate long-term user needs. However, it cannot be denied that the presence of information systems or information technology does not necessarily guarantee a positive effect on the organization, as evidenced by the research on the performance of public service agencies' financial reporting by Hakim & Wibowo (2021).

Referring to prior studies, our second hypothesis proposed in this research:

H₂: Sustainable information systems positively influence NTR sustainability.

4.3. Human resource competency and NTR sustainability

According to agency theory, government bureaucrats at the implementation level are the frontline in providing public services to the community. In practice, these bureaucrats often have discretion or freedom to make policies that may not align with the written policies of their organization. Some earlier studies have revealed the significant role of employee competence in improving organizational performance (Arlini et al., 2014; Fachri & Mediaty, 2019; Wardiana & Hermanto, 2019). However, it turns out that the elements of human resource competence do not always have a uniform effect in supporting performance. Pasae et al., (2021) found that knowledge and skills have a positive effect on performance. Conversely, employee experience and behavior do not impact performance achievement. In the context of NTR management, the ability of civil servants to support NTR management tasks includes not only knowledge and skill support but also soft skills such as employee behavior. Based on these factors, the hypotheses in this study are as follows:

H₃: Human resource competence has a positive effect on NTR sustainability.

4.4. Internal control and NTR sustainability

Several studies have highlighted the significant role of internal control in individual and organizational performance. Good quality internal control supports organizational performance, as evident in studies by Mardinan et al., (2018), Debora, (2018), and Utomo & Efendi, (2019). Organizational performance in the public sector can manifest as budget efficiency or the effectiveness of revenue target achievement. However, it is acknowledged that ineffective internal control may not have a positive impact on organizational performance. Y. A. Dewi et al., (2021) revealed that the internal control applied in the Nagari Village, Agam District, did not contribute to the performance of village fund management. This condition is strongly suspected to be due to the multitude of regulations that Nagari Village had to comply with, resulting in conflicting regulations that did not support each other.

In the context of NTR management, the internal control function is carried out by each NTR management unit in each Ministry/Agency (LMA). When each work unit fulfills the internal control function as mandated by Government Regulation No. 60 of 2008, the government agency responsible for managing NTR can effectively perform its public service duties. Ultimately, this will ensure the achievement of the state revenue targets in the State Budget (APBN), especially the NTR targets for each LMA. This also aligns with the NPM theory, which emphasizes the essential nature of measuring government agency performance. Internal control is one of the mechanisms designed to ensure that government agency performance can be achieved.

Therefore, based on the discussion above, the eighth hypothesis proposed in this research is:

H₄: Internal control positively affects the sustainability of NTR

4.5. The role of accountability on NTR sustainability

Several studies on the positive impact of accountability on organizational performance can be found in various literature, both international (Dooren et al., 2010; Dubnick, 2011; Romzek & Ingraham, 2009) and domestic (Furqan et al., 2020; Sattu et al., 2020). The positive influence of accountability on performance is also evident in the study by Risakotta & Akbar (2019), which examined the performance of the Maluku Provincial Government. Furthermore, Han (2020) in his observation of public sector accountability in the United States, found that the absence of accountability results in unsatisfactory organizational performance.

However, Pertiwi & Wibowo (2022) discovered that financial reporting accountability in central government agencies did not have a significant impact on the performance of public services using the NTR expenditure proxy. This finding is intriguing, considering that good accountability is a manifestation of good governance. Good governance should ideally lead to the delivery of quality and satisfactory public services to the community.

Organizations with increasingly better accountability should stimulate performance. Conversely, weaknesses or the absence of accountability can lead to disasters. Consistent with the theory of good governance, organizational effectiveness can be achieved through the improvement and strengthening of governance. Accountability is one form of good governance within an organization. Conversely, the lack of financial accountability in a government agency can create opportunities for corrupt practices (Hasan & Siti, 2014). The more corruption there is, the more threatened the state's future revenue continuity becomes. Therefore, accountability is a prerequisite that must be met to achieve sustained good performance.

Based on the above explanation, the final hypothesis in this research is

H₅: NTR accountability has a positive impact on the NTR sustainability.

In this study, we propose NTR accountability as a mediating factor because some determinants in NTR sustainability are also incorporated with supporting elements for accountability. Various studies disclosed that some variables like leadership, information systems, human resource competency, and internal control not only promote financial sustainability as discussed earlier but also have contributions to accountability enhancement (Alam et al., 2019; Arlini et al., 2014; Diansari et al., 2023).

Regarding accountability, Alam et al., (2019) found a positive influence of leadership quality on accountability in Malaysia. This finding aligns with the study by Sendjaya & Pekerti, (2010), which discovered that strong and ethically-behaved leaders can lead organizations in fostering an environment of accountability among employees. The impact of leadership style on accountability can also be observed in the works of Mardinan et al., (2018) and White & Rezania (2019).

Several previous studies have found the role of information technology utilization in accountability, particularly in the form of enhancing the quality of financial reports (Mardinan et al., 2018; Paddery, 2018; Sholehah & Sulistyawati, 2018; Winidyaningrum & Rahmawati, 2010). These findings reinforce earlier research conducted by Sagara (2015) when observing accountability in Lebak Regency. Y. A. Dewi et al., (2021) also discovered the significant role of information systems in improving village accountability in Agam Regency.

The studies conducted by Arlini et al., (2014); Ekayanti et al., (2018); Gunawan, Haming, Zakaria, & Djamareng, (2017) have demonstrated that to achieve quality asset management within a government agency, the placement of employees in asset management is crucial. This is because qualified employees can enhance the quality of asset management within an institution. Therefore, employee competence plays a significant role not only in asset management but also in other aspects of state finances, such as NTR.

The impact of internal controls on government accountability in the form of financial report quality has been found in several literature sources (Agustina & Setyaningrum, 2020; Pamungkas et al., 2018;

Rahayu & Fidiana, 2018). In their research, they discovered the crucial role of internal controls in supporting the strengthening of accountability. Internal controls also promote financial management accountability (Kewo, 2017). However, internal controls may not always support accountability if not properly implemented. This was found in research related to the quality of BLU financial reports by Hakim & Wibowo, (2021) and research on village fund accountability in. Y. A. Dewi et al., (2021).

Therefore, we develop a hypothesis regarding accountability's role in mediating many factors to contribute to NTR sustainability improvement (completed hypotheses displayed in Figure 1) as follows:

- H₆: Sustainable leadership has a positive impact on NTR sustainability through accountability
- H₇: Sustainable information system has a positive effect on the NTR sustainability through accountability
- H₈: Human resources competency has a positive influence on NTR sustainability through accountability
- H₉: Internal control positively affect the NTR sustainability through accountability

5. Research design

5.1. Population, sample, and data collection technique

Our approach for this research is an explanatory model that is meaningful for analyzing how one variable relates to other variables through hypotheses examination (Creswell et al., 2012; Hartono, 2015). The research data was generated through the distribution of questionnaires. The population of this survey research consists of thousands of bureaucrats entrusted with managing NTR in government ministries and agencies (LMA). The sampling of respondents for this study was done using non-probability sampling with a purposive sampling technique. Non-probability sampling is a sampling technique in which members of the population do not have an equal chance of being selected (Chandrarin, 2017). The non-probability technique was chosen because not all members of the population have relevant criteria to answer the research questions. Therefore, the sample was taken with specific criteria through purposive sampling.

The criteria for selecting the sample include two stages: the selection of institutions and the selection of respondents. The ministries and agencies selected as samples in this research have the following criteria: (i) LMA that have legislation governing the types and rates of NTR, (ii) LMA that have permission from the Ministry of Finance to use NTR funds, (iii) priority is given to LMA that have been among the top 20 contributors to NTR in the last three years.

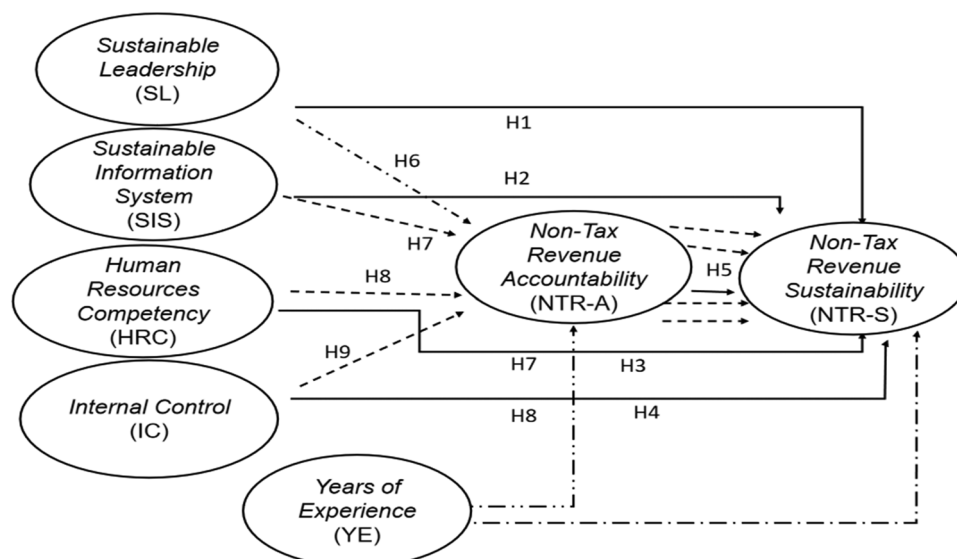


Figure 1. Research framework and hypotheses.

Table 1. Operationalization of research variables.

Variable's name, Code, and Role	Definition of Operation	Dimensions, Indicators, Code	Sources
NTR sustainability, NTR-S, endogenous	The NTR sustainability is a condition in which NTR remains a priority in the execution of the tasks and functions of ministries/ agencies, continues to be one of the main contributors to the State Budget (APBN), and requires budget allocation in the Ministry and Agency Work Plans and Budgets (WPB)	Strategic Planning (5 indicators, NTR-S01-NTR-S05) 1. Service capacity (7 indicators, NTR-S06-NTR-S12) 2. Revenue capacity (6 indicators, NTR-S13-NTR-S18) 3. Expenditure management (5 indicators, NTR-S19-NTR-S23) 4. Performance of budget execution quality (NTR-S24-NTR-S27)Total indicators in this variable = 27 items	1. Developed from the dimension of leadership and strategic vision by León (2001) 2. Developed from the dimension of service capacity proposed by IPSASB (2013) 3. Developed from the dimension of revenue capacity proposed by IPSASB (2013) 4. Developed from regulation concerning NTR 5. Developed from regulation concerning monitoring and evaluation of budget execution at LMA
NTR Accountability, NTR-A, exogenous, endogenous, and intervening	The NTR accountability indicates employee accountability represents concept of accountability focuses on what is perceived by individual civil servants who manage NTR in complying with the formal provisions governing NTR accountability	Atributability (5 indicators, NTR-A01-NTR-A05) 5. Observability (3 indicators, NTR-A06-NTR-A08) 6. Evaluability (3 indicators, NTR-A09-NTR-A11) 7. Answerability (3 indicators, NTR-A 12- NTR-A 14) 8. Consequentiality (5 indicators, NTR-A 15- NTR-A 19) 9. Political aspect (4 indicators, NTR-A20-NTR-A23) 10. Spirituality aspect (4 indicators, NTR-A24-NTR-A27)Total indicators in this variable = 27 items	6. Developed from Han & Perry, (2019) and regulation concerning NTR 7. Developed from Han & Perry, (2019) and regulation concerning NTR 8. Developed from Han & Perry, (2019) and regulation concerning NTR 9. Developed from Han & Perry, (2019) and regulation concerning NTR 10. Developed from Han & Perry, (2019), regulation concerning NTR, and regulation concerning public servant's performance assessment 11. Developed from Ahyaruddin & Akbar, (2017), Bovens, (2006) 12. Developed from Fares and Noordien (2016); Mennita & Priyanto (2022) 13. Developed from Lee (2017) and regulation concerning NTR
Sustainable leadership, SL, exogenous	Sustainable leadership is a leadership concept aimed at ensuring that the management of Non-Tax State Revenue can continue to be carried out in the long term.	Cohesive diversity (3 indicators, SL01-SL03) 11. Organizational justice (4 indicators, SL04-SL07) 12. Employee Development (4 indicators, SL08-SL11) 13. Progress orientation (3 indicators, SL12-SL14) 14. Work-life balance (3 indicators, SL15-SL17)Total indicators in this variable = 17 items	14. Developed from Lee (2017) and regulation concerning NTR 15. Developed from Lee (2017) and regulation concerning NTR 16. Developed from Lee (2017) and regulation concerning NTR 17. Developed from Lee (2017) and regulation concerning NTR
Sustainable information system, SIS, exogenous	A sustainable information system is a condition that the NTR system could serve for long-lasting at a satisfactory level	Quality (8 indicators, SIS01-SIS08) 15. Usage (4 indicators, SIS09-SIS12) 16. Benefit (3 indicators, SIS13-SIS15) 17. Sustainable (5 indicators, SIS16-SIS20)Total indicators in this variable = 20 items	18. Developed from Abdulkareem & Ramli, (2021); Ariyanto et al., (2022); DeLone & McLean, (2003); Indriani et al., (2020); Petter et al., (2008) 19. Developed from Abdulkareem & Ramli, (2021); Ariyanto et al., (2022); J. V. Chen et al., (2015); DeLone & McLean, (2003); Indriani et al., (2020); Petter & McLean, (2009); Ziemba, (2019)
Human resource competency. HRC, exogenous	Employee competency (HR) shows the ability and expertise of employees in understanding and mastering something, in this case competency in managing NTR both hard and soft skills.	Technical competency (11 indicators, HRC01-HRC11) 18. Managerial competency (8 indicators, HRC12-HRC19) 19. Social-cultural competency (HRC20-HRC22)Total indicators in this variable = 22 items	20. Developed from Arlini et al., (2014); Haryati, (2018); Mustapha, (2018) 21. Regulation concerning the handbook of civil servant's competency in Indonesia 22. Regulation concerning the handbook of civil servant's competency in Indonesia
Internal control, IC, exogenous	An integral process of actions and activities carried out continuously by leadership and all employees to provide adequate confidence in achieving organizational goals through effective and efficient activities, reliability of financial reporting, security of state assets, and compliance with laws and regulations	Control environment (4 indicators, IC01-IC04) 20. Risk assessment (4 indicators, IC05-IC08) 21. Control activity (3 indicators, IC09-IC11) 22. Information and communication (3 indicators, IC12-IC14) 23. Internal control monitoring (3 indicators, IC15-IC17)Total indicators in this variable = 17 items	Government regulation concerning the Government Internal Control System

(Continued)

Table 1. Continued.

Variable's name, Code, and Role	Definition of Operation	Dimensions, Indicators, Code	Sources
Working experience, WE, exogenous, control variable	The tenure of public servants working for government entities	Two indicators: 24. Years of experience as government as government officer 25. Years of experience assigned in the field of NTR Total indicators in this variable = 2 items The total indicators for all variables are 132 items	Bartram (2021); Kalaiwanen et al., (2021)

Furthermore, respondents from the selected LMA must: (i) have worked in government institutions for a minimum of 5 years, (ii) have worked in the field of NTR for a minimum of 2 years, (iii) have a minimum education level of a three-year college.

The sample size in this research follows the criteria recommended by Hair et al., (2014), known as the '10 times rule.' The 10 times rule means that the sample size required for data analysis using the Structural Equation Method-Partial Least Squares (SEM-PLS) model should be at least 10 times the sum of the largest number of formative indicators. The highest number of those indicators in our study is 27 items, so the minimum sample size should be 270 respondents. According to Kline (2005), a sample size is considered to be large if it is over 200 samples. In this study, after distributing questionnaires to selected government institutions as stated above, we got 353 returned questionnaires which were further processed and analyzed.

5.2. Variables and measurement

We use four independent variables, namely sustainable leadership (SL), sustainable information system (SIS), human resources competency (HRC), and external control (IC). This study places NTR accountability (NTR-A) as a mediating variable and NTR sustainability (NTR-S) as a dependent variable. All variables in our research were measured by using the Likert scale 1 to 5 where 1=strongly disagree; 2=disagree; 3=doubt; 4=agree; and 5 strongly agree. The explanation of the variables used in this research is presented in Table 1.

The testing of theories/hypotheses in this research is carried out using Structural Equation Modeling (SEM), which is a multivariate analysis technique used to analyze complex relationships between variables. SEM is used to examine and validate a model (Hair et al., 2019). The primary requirement for using SEM is to construct a hypothesis model consisting of structural and measurement models in the form of a path diagram based on theoretical justification. This research employs validity and reliability testing. Validity testing is used to assess whether a questionnaire is valid or not. According to Hair et al. (2019), a questionnaire is considered valid if the questions within it are capable of measuring what we intend to measure. Reliability testing is used to measure a questionnaire, which serves as an indicator of a variable or construct. A questionnaire is considered reliable if respondents' answers to the questions in the questionnaire are consistent over time.

6. Empirical results and discussion

6.1. Empirical results

6.1.1. Respondents profile

The research data was obtained through the distribution of questionnaires prepared using an online platform. The distribution of questionnaires was carried out through an official letter to several relevant institutions such as the Directorate General of Budget, Directorate General of Treasury, and Directorate General of State Assets. These three institutions are unit echelon I under the Ministry of Finance of Republic of Indonesia which have stakeholders from various LMA as NTR collecting agencies. The questionnaire data filled out by respondents were received by the researcher during the period from April 3 to June 20, 2023. The respondents who filled out the questionnaire during that period amounted to 363

individuals, with 353 questionnaires are considered as completed forms. The distribution of respondents is quite good because there is representation from each LMA that is among the top 20 NTR generators, although in varying numbers. The largest number of respondents comes from the Ministry of Health, totaling 53 individuals or 15 percent of the total respondents, while the second highest is the Ministry of Finance with 48 individuals or 13.6 percent.

6.1.2. Validity and reliability tests

Before testing the hypotheses, we conducted the validity and reliability tests. This study utilizes four independent variables, one intervening variable, one dependent variable, and one control variable, with a total of 132 indicators. The initial stage in processing primary data is to assess the validity of whether all 132 indicators can be used for hypothesis testing. In the SEM-PLS application, the validity of indicators can be observed through the magnitude of loading factors. Hair et al. (2019) explained that loading factors that can be used as a reference for assessing the validity of primary data in SEM models range from 0.5 to 0.7. Meanwhile, indicator reliability is assessed using Cronbach's alpha, with a minimum value of 0.7 considered a good measure (Kwong & Wong, 2019). Table 2 below presents a summary of the outer loading of indicators used in our study.

Based on the information in Table 2 above, the total number of valid indicators is 107 items. These valid indicators were subsequently subjected to reliability testing, and the results were excellent as all variables had Cronbach's alpha scores above 0.7, with some even exceeding 0.94. The results of the multicollinearity test indicated that the VIF scores for each indicator remained below 10, indicating the absence of multicollinearity issues among the independent variables.

6.2. Hypotheses test results

Table 3 displays the testing results of our hypotheses. We can see that sustainable leadership (SL), sustainable information systems (SIS), and human resource competency (HRC) do not have positive impacts

Table 2. Outer loading.

Variables	Indicators			Validity (<i>outer loading</i>)	Reliability (Cronbach's alpha)
	Total	Valid	Not Valid		
NTR sustainability (NTR-S)	27	13	14	0.614-0.818	0.963
NTR accountability (NTR-A)	27	19	8	0.562-0.820	0.948
<i>Sustainable Leadership (SL)</i>	17	17	0	0.639-0.871	0.966
<i>Sustainable Information System (SIS)</i>	20	20	0	0.619-0.849	0.973
Human resource competency (HRC)	22	20	2	0.556-0.871	0.963
Internal control (IC)	17	17	0	0.701-0.879	0.969
Working experience (WE)	2	1	1	0.998	1.000
Total indicators	132	107	25		

Table 3. Hypotheses testing result.

Hypotheses	Symbol	Coefficient	Std Dev	t-stat	p-values	Conclusion
H ₁	SL → NTR-S	0.103	0.068	1.523	0.128	Not supported
H ₂	SIS → NTR-S	-0.027	0.051	0.533	0.594	Not supported
H ₃	HRC → NTR-S	0.005	0.066	0.080	0.936	Not supported
H ₄	IC → NTR-S	0.300	0.075	4.006	0.000	Supported
H ₅	NTR-A → NTR-S	0.473	0.072	6.602	0.000	Supported
H ₆	SL → NTR-A → NTR-S	0.167	0.038	4.418	0.000	Supported as mediating
H ₇	SIS → NTR-A → NTR-S	0.037	0.019	1.937	0.053	Not supported
H ₈	HRC → NTR-A → NTR-S	0.2000	0.046	4.346	0.000	Supported as mediating
H ₉	IC → NTR-A → NTR-S	0.052	0.032	1.600	0.110	Not supported
Non-hypothesis	WE → NTR-S	0.010	0.031	0.310	0.757	Not supported
Non-hypothesis	WE → NTR-A → NTR-S	0.031	0.012	2.607	0.009	Supported as mediating

Note. R-squared for these hypotheses tests is 0.675 for $n=353$.

on NTR sustainability (NTR-S). Thus, H_1 , H_2 , and H_3 are not supported respectively. Meanwhile, internal control (IC) and NTR accountability (NTR-A) positively influence NTR-S, hence, H_4 and H_5 are accepted. It indicates that these two variables are matter in explaining NTR-S variability. Based on a path analysis, we obtain information from Table 3 that NTR-A does have a role as a mediating variable in the positive effect of SL and HRC on NTR-S respectively. Therefore, H_6 and H_8 are confirmed in this study. On the other hand, SIS and IC do not have an indirect effect on NTR through NTR-A, accordingly, H_7 and H_9 are not supported. In the light of the control variable, Table 3 presents that working experience does not positively affect NTR-S but it does indirectly influence NTR-A.

Subsequently, this study is attempting to propose a new measurement for NTR-A beyond established literature and develop NTR-S from previous guidance. The old model of NTR-A is based on the study of Han & Perry (2019) whereas felt or individual accountability is measured in five dimensions (attributability, observability, evaluability, answerability, and consequentiality). This research proposes two additional dimensions, political (developed by Ahyaruddin & Akbar, (2017), Bovens, (2006)) and spiritual aspects (as suggested by Fares & Noordin (2016); Mennita & Priyanto (2022)). On the other hand, NTR-S measurement was developed by IPSASB (2013) and Leon (2001). In the IPSASB (2013) model, fiscal sustainability can be viewed from three dimensions, while Leon (2001) argues that fiscal sustainability comes from four pillars. These two models are adapted to existing NTR regulation, so that we propose 5 dimensions to measure NTR-S.

6.3. The discussion

The results of this study confirm leadership does not have a direct impact on NTR-S (Tables 4 and 5). This indicates that even though leadership may create a strengthening of accountability, a leader cannot immediately influence NTR sustainability. The findings in this study are not in line with Munford's study, which revealed that good leadership supports fiscal sustainability in non-profit organizations. This research also does not support Lee's (2017) findings regarding the important role of leadership in achieving the performance of government agencies. However, this study is consistent with the findings of Rachmawati and Salendu (2022), who did not find any impact of leadership on the performance of public sector organizations.

Based on the hypotheses test results, there was no influence of the utilization of information technology on NTR performance was found. This condition aligns with the findings of Hakim and Wibowo (2021)

Table 4. Direct vs indirect effects.

Direct effect			Coefficients	Indirect effect		Coefficients
SL	→	NTR-S	0.103	SL → NTR-A → NTR-S		0.167**
SIS	→	NTR-S	-0.027	SIS → NTR-A → NTR-S		0.053
HRC	→	NTR-S	0.005	HRC → NTR-A → NTR-S		0.200**
IC	→	NTR-S	0.300**	IC → NTR-A → NTR-S		0.052
WE	→	NTR-S	0.010	WE → NTR-A → NTR-S		0.031**

Note: ** significant at 1% level, * significant at 5% level.

Table 5. Sensitivity analysis for NTR-S variable.

Influence Tests			Coefficient	Std Dev	t-stat	p-values	Conclusion
New Model with additional dimensions- R-squared 0,675, n=353							
SL	→	NTR-S	0.103	0.068	1.523	0.128	H_1 is not supported
SIS	→	NTR-S	-0.027	0.051	0.533	0.594	H_2 is not supported
HRC	→	NTR-S	0.005	0.066	0.080	0.936	H_3 is not supported
IC	→	NTR-S	0.300	0.075	4.006	0.000	H_4 supported
NTR-A	→	NTR-S	0.473	0.072	6.602	0.000	H_5 supported
WE	→	NTR-S	0.010	0.031	0.310	0.757	Not significant
Old Model without dimensions improvement in NTR-A and NTR-S- R-squared 0.556, n=353							
SL	→	NTR-S	0.141	0.092	1.535	0.125	H_1 is not supported
SIS	→	NTR-S	0.026	0.055	0.477	0.633	H_2 is not supported
HRC	→	NTR-S	0.094	0.084	1.114	0.266	H_3 is not supported
IC	→	NTR-S	0.296	0.105	2.818	0.005	H_4 supported
NTR-A	→	NTR-S	0.267	0.078	3.389	0.000	H_5 supported
WE	→	NTR-S	0.045	0.035	1.286	0.199	Not significant

in their research on the financial reporting performance of public service agencies, which stated that the presence of information systems and information technology does not necessarily have a positive effect on organizations. In addition, the Directorate General of Budget as a NTR regulatory body has developed many supporting applications at each stage of NTR management. The author suspects that each of these applications contributes to the efforts to achieve efficient NTR management, so the role of SIMPONI in NTR sustainability cannot be observed separately.

Our study confirms that human resource competency does not have a direct impact on NTR sustainability. The five most important indicators for NTR sustainability, based on the order of outer loading values, include efficient NTR management, clarity of outputs in NTR management, effective NTR management, the implementation of minimum service standards, and the ability to provide long-term public services. These five indicators, it turns out, are not sufficiently improved by the top five competencies possessed by bureaucrats. Pasae et al. (2021) found that knowledge and skills have a positive effect on performance. Conversely, the experience and behavior of employees do not have an impact on performance achievement. This means that employee attitudes play an equally important role in organizational effectiveness.

Internal control has proven to ensure the effectiveness and efficiency of NTR management. This picture reflects that the internal control scheme designed in Government Regulation Number 60 of 2008 has been effective in safeguarding state revenue and assets. This study supports prior studies, such as Mardinan et al. (2018), Debora (2018), and Utomo & Efendi (2019) who discovered that Good quality internal control is favorable for organizational performance. The performance of the public sector can manifest as budget efficiency or the effectiveness of revenue target achievement which are relevant in the NTR context. However, our study is contrary with study by Dewi et al. (2021) who revealed the internal control did not contribute to the performance of public sector organizations from in the perspective of village fund management.

Turning to the effect of accountability, this research confirms several studies conducted by several authors such as Dooren et al. (2010), Dubnick (2011), Romzek & Ingraham (2009) and Furqan et al. (2020), and Sattu et al. (2020). The positive influence of accountability on performance is also evident in the study by Risakotta & Akbar, (2019), which examined the performance of the Maluku Provincial Government. Furthermore, Han (2020), in their observation of public sector accountability in the United States, found that the absence of accountability results in unsatisfactory organizational performance. However, this study is different from the study of Pertiwi & Wibowo (2022) which discovered that financial reporting accountability in central government agencies did not have a significant impact on the performance of public services using the NTR expenditure as a proxy.

Accountability is one form of good governance in the public sector. The lack of financial accountability in a government agency can create opportunities for corrupt practices (Hasan & Siti, 2014). The more corruption there is the greater the threat to the future sustainability of state revenue. Thus, accountability is a prerequisite for achieving sustained good performance. Han (2020), in his observation of public sector accountability in the United States, also found that the absence of accountability results in unsatisfactory organizational performance.

The practices of violations in NTR management by NTR collecting agencies, as revealed by the audits conducted by the Supreme Audit Agency (BPK), are suspected to be caused by excessive bureaucratic flexibility. Ministries and government agencies that do not violate NTR governance rules should be able to easily achieve both short-term and long-term NTR targets. Continuous violations by these agencies will have a long-term impact on NTR sustainability.

Based on Table 4, we argue that accountability plays a crucial mediating role in the influence of independent variables on NTR sustainability. This finding strengthens previous research results, such as White & Rezania (2019) when examining accountability at a university in the United States and the study by Kang et al. (2022) on companies in Taiwan. Good accountability ultimately affects organizational performance (R. C. Dewi & Riantoputra, 2019).

NTR accountability has proven to be a critical requirement for securing long-term NTR management. The role of accountability in safeguarding NTR sustainability is evident across various central government entities. However, from an NTR object perspective, accountability is more effective in achieving NTR performance in service and state property compared to other NTR objects.

The crucial role of accountability as a mediating variable is especially important for variables that do not significantly impact NTR sustainability, such as leadership (SL) and human resource competency (HRC). Leadership will have meaning for sustainable NTR management if it can encourage government officials to adhere to accountability principles. Furthermore, human resource competency can be a powerful tool in securing non-tax state revenue in the long term if it internalizes NTR accountability values.

Based on the data in [Table 4](#) above, it can be observed that sustainable leadership (SL) is more meaningful in improving NTR performance when it is achieved through the enhancement of employee accountability first. The same applies to human resource competency and work experience as civil servants. On the other hand, internal control is more potent in directly influencing NTR sustainability (0.3) compared to going through accountability, which is not significant at the 5% level. Meanwhile, sustainable information systems (SIS) do not have a significant impact on NTR sustainability, either directly or indirectly.

The positive effect of accountability on NTR sustainability either as an independent variable or a mediating variable as revealed in our study is relevant to agency theory within the NPM framework. Agency theory in the public sector is relevant considering that bureaucrats should explain the performance they have achieved to the public through members of parliament. Explanation of performance is one of the core concepts of NPM. Government officers who handle NTR management realize that their performance is evaluated by supervisors from numerous aspects. NTR performance is now considered to be one of valuable elements in assessing public officers. The more compliant government employees with NTR regulations, the more likely they show excellent individual accountability. Thus, the NPM doctrine which emphasizes performance measurement makes agency theory important to apply in the public sector.

Meanwhile, this study confirms the stakeholder theory that in the NTR management context, public servants must concern regarding the interests of surrounding stakeholders. NTR sustainability and NTR accountability have become more strategic issue to discuss not only among government institutions but also politicians from House of Representative. Persistent audit findings in NTR area attract public attention. People may doubt the seriousness of government to address these problems. On the other hand, NTR has been consistent to contribute for national budget revenue in the last decades. This means that if we would like to ensure fiscal sustainability is stable in upcoming years, NTR issues as revealed as audit findings must be handled properly. This issue is now becoming essential to overcome by government officers across LMAs who are in charge in NTR management.

6.6. Robustness check

The hypotheses test results as can be seen in [Table 3](#) are derived from the new model with seven dimensions for NTR-A and five dimensions for NTR-S. To ensure whether our new model for NTR-A and NTR-S are relatively better than the old ones, we did a sensitivity analysis. This analysis is conducted by comparing the hypotheses test results (direct effect only) in [Table 3](#) with the hypotheses test of the previous models (without any dimension improvements), as it is shown in [Table 5](#) below.

Based on the sensitivity test results in [Table 5](#), it can be stated that the new model containing novelty is superior to the old model without novelty, with the following arguments. Firstly, the R-squared of the new model (0.675) is significantly higher compared to the R-squared of the old model (0.556). Secondly, the estimated coefficient values for significant variables in the new model are higher than those in the old model. The estimated coefficient value for IC in the main model is 0.300, which is higher than the parameter value for IC in the old model, which is only 0.296. Similarly, the estimated coefficient value for NTR-A in the new model (0.473) is higher compared to the old model (0.267). Thus, this study makes a significant contribution to measurement development both in accountability and fiscal sustainability in the context of the NTR regime in Indonesia

7. Summary and conclusion

This study aims to analyze the factors influencing NTR sustainability with accountability as a mediating variable. The research also observes whether these factors have a stronger direct impact on NTR sustainability or an indirect impact through accountability as an intervening variable. The research subjects are civil servants involved in the NTR management process within LMA. Based on our observation, we

conclude that sustainable leadership, sustainable information systems, and human resource competency were not found to have a direct impact on NTR sustainability. Only internal control has been proven effective in directly promoting efficient NTR management. The crucial role of internal control in supporting NTR sustainability is also evident in various agencies, regardless of their functional unit type, whether public service agencies or not. NTR accountability has proven to be a critical requirement for securing sustainable NTR management. Based on path analysis, it is evident that only internal control has a greater direct impact on NTR sustainability compared to going through accountability. Leadership and human resource competency are more effective in achieving effective and efficient NTR management when mediated by employee accountability first. Meanwhile, information systems do not affect NTR sustainability, either directly or indirectly.

Based on the sensitivity test, it has been proven that the new measurement model for NTR accountability and NTR sustainability is superior to the previous model. The measurement model for accountability needs to include political and spiritual dimensions, while the measurement model for fiscal sustainability in the field of NTR needs to incorporate spending management and budget execution performance dimensions.

Practically, the research results contribute to NTR management agencies in strengthening accountability by internalizing accountability principles in NTR management. Moreover, NTR management agencies are expected to improve budget performance to ensure public services based on NTR fund collection are maintained. This study also suggests that to promote long-lasting NTR contributor the national budget, existing NTR regulations, to some extent, need to be revised to accommodate reward and punishment policy in the NTR framework. LMAs must maintain and strengthen internal control within institutions to support NTR sustainability. The central government agencies also need to formulate human resource development policy by adopting talent management to result in better qualified leaders in near future.

This study has several limitations. First, this research focused mainly on the top twenty of government agencies in terms of NTR contributor to the national budget. Audit problems may be present beyond our sample institutions. Second, our respondents may not be proportional to the number of NTR collector agencies. There are LMA with a small number of respondents even though they have a large number of work units. This is due to the difficulty in finding respondents willing to fill out a questionnaire containing more than a hundred statements. Third, we have not met many key persons in NTR management to discuss our study results because of limited time. Therefore, we recommend that for future research it is meaningful to examine our methodology to develop some other measurements for accountability and sustainability to apply to other areas areas a such federal tax or local government revenue. We also suggest that some other research approaches may be valuable to enrich discussions and deepen analysis such as experiment design or ethnography.

Authors' contribution

Conceptualization – P.W.; Methodology – P.W., E.M Formal Analysis – P.W., E.M.; Investigation – P.W., E.M.; Writing – Original Draft – P.W.; Writing – Review & Editing – P.W., E.M.; Supervision – E.M.; Project Administration: P.W.; Funding Acquisition for publication: P.W., E.M. All authors agree to be accountable for all aspects of the work

Disclosure statement

There are no relevant financial or non-financial competing interests to report.

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Data availability statement

Data regarding non-tax revenue performance can be accessed from official website of the Ministry of Finance of Republic of Indonesia (www.kemenkeu.go.id). Meanwhile, data relating to audit findings are available at Indonesian Supreme Auditor's official website (www.bpk.go.id). Research data regarding returned surveys from respondents and SEM-PLS output can be obtained by sending us an email to: etty.murwaningsari@trisakti.ac.id

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