Risk-based VAT planning model: optimizing compliance and VAT savings

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Abstract

This study develops a risk-based VAT tax planning model that emphasizes tax compliance as a mediating variable in optimizing tax savings in construction companies. Using a sequential explanatory mixed-method design, quantitative data were collected through questionnaires from 60 respondents representing medium-sized construction firms in the City of Tangerang, followed by a focus group discussion with tax consultants to support model interpretation. Sixteen hypotheses were tested using path analysis. The results indicate that all VAT planning components timely VAT reporting, optimization of input tax crediting, delay in tax invoice issuance, postponement of input tax crediting, and the selection of restitution or compensation schemes, have a significant effect on tax compliance. However, only strategic variables, namely delaying tax invoice issuance and selecting restitution or compensation schemes, have a significant direct effect on optimizing tax savings. Other administrative strategies affect tax savings indirectly through tax compliance. Tax compliance itself has a significant positive effect on VAT savings optimization and partially mediates the relationship between VAT planning practices and tax savings. This study introduces a risk-based, compliance-oriented VAT planning model that supports sustainable VAT savings and recommends integrating compliance risk management into VAT planning and administrative practices.

Keywords: *vat tax planning, tax compliance, vat savings optimization*

Introduction

Value Added Tax (VAT) is an important source of state revenue, contributing continuously to the state budget (APBN). The construction sector is a major contributor due to its substantial contract values and complex transaction structures involving planning, implementation, and oversight services. However, there are a number of challenges to VAT management in this industry, including inconsistent input and output VAT recording, delays in the administration of e-invoices, and inadequate internal controls, which lead to poor tax planning efficacy and a high risk of non-compliance. A more cautious approach to tax management is needed due to the VAT rate policy adjustment from 10% to 11% in 2022 and the anticipated increase to 12% in 2025 (Agasie & Zubaedah, 2022).

Previous study has placed more attention on administrative compliance elements or macroeconomic analysis. Kirana & Widodo (2023) highlights the application of VAT before and after the Tax Harmonization Law No. 7 of 2021, but has not yet tied it to tax planning techniques.Zulfiani, Arief, & Rambe (2021) evaluates the implementation of VAT tax planning descriptively but does not include risk management. Meanwhile Mega Putri (2024) ocuses more on the influence of VAT rates on the economy and consumption, without examining operational procedures in construction enterprises. The effect of e-

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Invoice/E-SPT deployment on PKP compliance (Liing et al., 2023) and the connection between tax incentives, audits, and VAT revenues where compliance has been shown to be a significant determinant are other pertinent issues (Bagus et al., 2022). This points to a research gap in the creation of a model that uses tax compliance as an intervening variable to incorporate risk management into tax planning. This can increase efficiency and tax compliance, especially when it comes to VAT (Suryani, 2021; Suwandi et al., 2024). To examine the causal relationship between risk-based VAT planning components, such as Timely VAT Reporting Deposits, Maximizing Input Tax Crediting, Delaying Tax Invoice Creation, Delaying Input Tax Crediting, and Selection of VAT Restitution or Compensation Schemes towards VAT Savings Optimization, both directly and through the mediation of tax compliance that will be developed, this research model was developed empirically using path analysis with tax compliance as an intervening variable (mediator).

This research focuses on identifying important VAT risks in Indonesian construction enterprises that influence the effectiveness of tax planning, and explores the key components of a risk-management-based VAT tax planning model to VAT savings optimization. Additionally, the association between risk-based tax planning and VAT savings optimization is mediated by tax compliance, according to this study. In addition, this study intends to investigate how risk management is incorporated into tax planning and the mediating function of tax compliance while taking into account the real-world requirements of the construction industry.

The aims of this study are to identify important VAT risks in construction enterprises, establish the basic components of a risk-management-based VAT tax planning model, and analyze the function of tax compliance as an intervening variable. By combining the ideas of tax planning, risk management, and tax compliance into a unified empirical framework, this study makes a theoretical contribution. It is anticipated that the research's practical implications will assist construction firms in creating regulation-adaptive tax planning methods. Policy-wise, this study might provide data-based input to the government to design more effective and balanced VAT laws.

Unlike prior studies that examine VAT compliance or tax planning in isolation, this study integrates tax risk management and compliance within a unified empirical framework to explain VAT savings optimization in the construction sector. By incorporating tax compliance as a mediating mechanism, the proposed risk-based VAT planning model provides new empirical evidence on how administrative VAT practices can generate sustainable tax savings through compliance-driven strategies in an emerging economy context

Value-Added Tax (VAT) planning refers to a series of administrative and strategic actions undertaken by firms to optimize VAT obligations within the framework of prevailing tax regulations. VAT planning includes managing reporting timing, optimizing input tax credits, postponing tax invoice issuance, deferring input tax crediting, and selecting appropriate restitution or compensation schemes. Prior studies indicate that VAT administrative strategies can influence tax efficiency and corporate financial performance when implemented within regulatory boundaries (Suryani, 2021; Suwandi et al., 2024).

Tax compliance reflects the extent to which taxpayers fulfill their obligations in accordance with tax laws and administrative requirements. In the VAT context, compliance involves timely reporting, accurate calculation of output and input VAT, and proper

documentation of taxable transactions (Bagus et al., 2022). Higher compliance levels reduce the risk of sanctions and disputes and support effective tax administration (Gunawan & Rosid, 2025).

Timely VAT reporting (TR) strengthens administrative discipline and reduces discrepancies in VAT filings. Consistent reporting behavior demonstrates adherence to regulatory requirements and may enhance corporate tax compliance (Bagus et al., 2022). From a compliance theory perspective, compliant behavior arises when firms operate within a structured tax administration system supported by a clear fiscal strategy (Suandy, 2016). Normative deterrence theory further predicts that certainty of sanctions and administrative nudges encourage timely tax payments and reporting. Experimental evidence in Indonesia shows that intervention letters significantly increase compliance with tax fine payments, consistent with findings by Yogama, Gray, & Rablen (2024)that enforcement certainty reduces VAT payment delays. Moreover, the implementation of digital reporting systems such as e-Invoice and e-SPT has been shown to positively affect the compliance of Taxable Entrepreneurs (Liing et al., 2023), while weak VAT management reduces compliance quality (Gunawan & Rosid, 2025). Therefore, timely VAT reporting is expected to positively influence tax compliance.

H1: Timely VAT reporting has a positive effect on tax compliance.

Optimization of input tax credits (ITC) improves the accuracy of VAT calculation and reduces misstatement risks. Proper management of input tax crediting may support more compliant reporting behavior (Suryani, 2021). A clear and verifiable input tax crediting mechanism lowers dispute risks and strengthens compliance incentives. Cross-country evidence suggests that digitalization and e-invoicing systems improve the traceability and accuracy of input VAT credits, thereby causally enhancing VAT compliance. Marzuki (2022) emphasizes that structured crediting procedures within the tax period minimize reporting errors and encourage administrative compliance. In line with compliance theory, effective VAT documentation systems and fiscal strategies foster compliant behavior (Suandy, 2016), whereas weak VAT management practices reduce compliance quality (Gunawan & Rosid, 2025). Accordingly, optimization of input tax credits is expected to positively influence tax compliance.

H2: Optimization of input tax credits has a positive effect on tax compliance.

Compliance theory explains that compliant behavior occurs when a company has a well-structured tax administration system and a clear fiscal strategy (Suandy, 2016). In the context of VAT reporting, the timing of tax invoice issuance constitutes part of managerial fiscal strategy. Delaying tax invoice issuance (TID) within the legally permitted period can function as a fiscal timing strategy that requires disciplined documentation and reporting processes. Research Maria Fabiola Da Liing et al. (2023)shows that the implementation of e-Invoice and e-SPT positively affects the compliance of Taxable Entrepreneurs, while Gunawan & Rosid (2025) emphasize that weak VAT management reduces compliance quality. From a deterrence and compliance perspective, certainty of procedures and enforcement reduces reporting delays and non-compliance in VAT payments (Yogama et al., 2024). When properly administered within regulatory boundaries, TID may strengthen internal monitoring and encourage more structured reporting behavior (Suwandi et al.,

2024). Thus, strategically managed and legally compliant tax invoice timing is expected to enhance overall tax compliance.
H3: Delaying tax invoice issuance has a positive effect on tax compliance.

A clear and verifiable input tax crediting mechanism lowers the effective tax burden and reduces disputes, thereby increasing compliance incentives. Cross-country evidence suggests that digitalization and e-invoicing systems which enhance the accuracy and traceability of input tax credits causally improve VAT compliance. Marzuki (2022) emphasizes alternative crediting procedures within the tax period that minimize errors and promote administrative compliance. Postponement of input tax crediting (ICD) within allowable limits may assist firms in aligning tax reporting with financial cycles and strengthening internal VAT control mechanisms (Bagus et al., 2022). When supported by proper documentation and systematic recording, such postponement can improve reporting accuracy and reduce correction risks. Moreover, policy evidence indicates that well-managed credit and refund systems strengthen compliance incentives, whereas weak administration may encourage arrears and non-compliance (Pessoa, Okello, Swistak, & De Pau, 2021). Therefore, the structured and regulated postponement of input tax crediting is expected to positively influence tax compliance.
H4: Postponement of input tax crediting has a positive effect on tax compliance.

The selection of VAT restitution or compensation schemes (RS) represents a strategic fiscal decision that must comply with procedural regulations. Appropriate scheme selection may improve administrative compliance (Gunawan & Rosid, 2025). A credible, expeditious, and risk-based VAT refund scheme strengthens the "compliance bargain," whereby taxpayers are more willing to report transactions accurately if excess VAT is refunded in a timely manner (Pessoa et al., 2021). Policy and quasi-experimental evidence indicate that effective refund management reduces incentives for manipulative practices, while poor refund systems encourage arrears and non-compliance. Consistent with compliance theory, structured administrative systems and clear fiscal strategies promote compliant behavior (Suandy, 2016). Therefore, appropriate restitution or compensation scheme selection is expected to positively influence tax compliance.
H5: Compensation schemes has a positive effect on tax compliance.

Timely VAT reporting improves transparency and reduces discrepancies between output and input VAT, potentially contributing to VAT savings optimization (Suryani, 2021). From a tax planning theory perspective, structured payment timing and administrative arrangements can reduce fiscal uncertainty without violating tax regulations (Suandy, 2016). The implementation of electronic mechanisms such as e-Invoices and e-SPT enhances VAT administration, reduces the risk of fines and adjustments, and improves administrative efficiency. Empirical evaluation of Indonesia's e-taxation system shows increased compliance and efficiency following e-Invoice digitalization (Mahatma & Abbas, 2023). As effective tax planning improves tax efficiency and financial performance (Istighfara & Biduri, 2024), timely VAT reporting is expected to contribute directly to VAT savings optimization.
H6: Timely VAT reporting has a positive effect on VAT savings optimization.

Optimizing input tax credits ensures that all eligible credits are claimed, which may reduce effective VAT burdens and enhance VAT savings (Bagus et al., 2022). Tax planning theory emphasizes that proper utilization of input VAT constitutes a legitimate strategy to minimize tax burdens (Suandy, 2016). Input tax crediting represents the most direct technical instrument for reducing VAT liability. She, Sun, & Yan (2025)demonstrate that effective credit and refund mechanisms reduce cash flow pressures and improve operational efficiency, thereby enhancing firms' capacity to optimize VAT savings. Consistent with findings that effective tax planning improves tax efficiency (Istighfara & Biduri, 2024), input tax credit optimization is expected to positively influence VAT savings.
H7: Optimization of input tax credits has a positive *effect on VAT savings optimization.*

Delaying tax invoice issuance within legal boundaries may affect VAT recognition timing and improve short-term liquidity, contributing to VAT savings (Suwandi et al., 2024). The timing of tax invoice issuance influences the recognition period of output VAT and the distribution of VAT burdens across accounting periods, thereby functioning as a strategic cash flow management tool (Latifa, Ritchi, & Tanzil, 2023; Amang, & Nurwanah, 2025). In line with tax planning theory, transaction timing arrangements constitute a legitimate fiscal strategy for reducing short-term tax burdens without violating regulatory provisions (Suandy, 2016). Therefore, strategic timing of tax invoice issuance is expected to enhance VAT savings optimization.
H8: Delaying tax invoice issuance has a positive effect on VAT savings optimization.

Strategic postponement of input tax crediting may help firms manage VAT liabilities more efficiently, influencing VAT savings outcomes (Suryani, 2021). Within allowable regulatory limits, postponing the recognition of input tax credits enables firms to align VAT obligations with cash flow conditions and operational cycles, thereby improving liquidity management and reducing short-term financing costs. Empirical evidence suggests that effective VAT management practices contribute to fiscal efficiency and reduce unnecessary tax burdens (Bagus et al., 2022). Moreover, sound credit and refund governance frameworks are associated with lower administrative distortions and improved financial performance, indicating that structured credit management may enhance overall tax efficiency (Pessoa et al., 2021). Taken together, these arguments indicate that the strategic and regulated postponement of input tax crediting may directly contribute to VAT savings optimization by improving liability timing, minimizing correction risks, and enhancing cash flow flexibility.
H9: Postponement of input tax creditinghas a positive effect on VAT savings optimization.

Selecting an appropriate restitution or compensation scheme may reduce overpayment risks and improve liquidity, thereby enhancing VAT savings optimization (Gunawan, 2017). A fast and reliable VAT refund process reduces cash flow pressures and funding costs, enabling firms to realize VAT savings more effectively. She et al. (2025)show that accelerated refund processes increase investment and reduce operational cost burdens, indirectly reflecting improved VAT savings performance. Consistent with tax planning theory, structured utilization of refund mechanisms constitutes a legitimate strategy for optimizing tax efficiency (Suandy, 2016). Given that effective tax planning enhances

financial performance (Istighfara & Biduri, 2024), appropriate restitution scheme selection is expected to positively influence VAT savings.
H10: Compensation schemes has a positive effect on VAT savings optimization.

Tax compliance reflects the taxpayer's ability to fulfill all tax obligations, including registration, calculation, payment of taxes owed, settlement of arrears, and resubmission of tax returns (Adikara & Rahayu, 2022).It encompasses both formal compliance such as timely reporting and document completeness and material compliance, namely the accurate payment of tax liabilities. A high level of compliance enhances transparency in VAT administration and reduces the risk of sanctions, corrections, administrative disputes, and additional financing costs arising from delays or problematic claims (Bagus et al., 2022). Empirical evidence further shows that stronger compliance improves fiscal efficiency by increasing VAT revenue and reducing tax avoidance practices (Ekawarti, Widyastuti, Alfiana, & Summagat, 2025), while improvements in corporate administrative practices are associated with greater fiscal discipline and lower inefficiencies (Pratama & Muhammad, 2025). Accordingly, firms with higher tax compliance are better positioned to implement VAT savings strategies such as timely crediting, orderly restitution submission, and avoidance of penalties thereby enhancing VAT savings optimization.
H11: Tax compliance has a positive effect on VAT savings optimization.

From a mediation perspective, tax compliance may function as an operational mechanism through which VAT planning strategies translate into VAT savings outcomes (Suwandi et al., 2024). Timely reporting may influence VAT savings indirectly through improved compliance behavior. he integration of risk-based tax planning with tax compliance further suggests that a sound fiscal strategy will only be effective when supported by strong administrative compliance. Although timely VAT reporting reflects structured administrative discipline, its contribution to VAT savings depends on whether reporting accuracy and payment discipline are consistently maintained. Research by Gunawan & Rosid (2025) shows that weak tax standard operating procedures lead to fiscal inefficiency, whereas compliance strengthens the relationship between tax planning and performance. Therefore, timely VAT reporting is expected to enhance VAT savings not only directly, but also indirectly through strengthened tax compliance, which ensures accurate reporting, reduces penalties, and minimizes financing costs arising from administrative errors.
H12: Tax compliance mediates the relationship between TR and VAT savings optimization.

Optimization of input tax credits may enhance VAT savings through compliance-driven reporting accuracy (Suryani, 2021). Input tax crediting constitutes a technical VAT planning instrument; however, its effectiveness in generating savings depends on compliance in documentation, verification, and reporting. Theoretically, compliance strengthens the transmission of administrative practices into financial outcomes, as accurate credit realization requires both formal completeness and material correctness. Empirical evidence indicates that acceleration and certainty in input-credit processes improve corporate liquidity and investment capacity (Brusco, Piek, & Velayudhan, 2024). Furthermore, refund and credit policies are shown to enhance firm performance and development capacity (She et al., 2025). Therefore, optimized input tax crediting is expected to contribute to VAT

savings more effectively when supported by high tax compliance.
H13: Tax compliance mediates the relationship between optimization of input tax credits and VAT savings optimization.

Tax invoice delay strategies may contribute to VAT savings through strengthened compliance practices (Bagus et al., 2022). Delaying tax invoice issuance within legal limits may serve as a timing strategy for managing VAT recognition and short-term liquidity. Nevertheless, such timing strategies only translate into real financial benefits when accompanied by disciplined compliance in documentation and reporting. Companies with weak tax procedures tend to experience inefficiencies despite planning strategies (Suwandi et al., 2024). Compliance ensures that invoice timing adjustments remain within regulatory boundaries and do not trigger sanctions or corrective actions. Accordingly, the impact of tax invoice delay strategies on VAT savings is expected to occur indirectly through strengthened tax compliance.
H14: Tax compliance mediates the relationship between delaying tax invoice issuance and VAT savings optimization.

Postponement of input tax crediting may influence VAT savings indirectly through compliance mechanisms (Gunawan, 2017). The strategy of delaying input tax credit recognition can assist firms in aligning VAT reporting with financial cycles and liquidity management considerations, thereby creating potential fiscal flexibility. However, the effectiveness of this strategy depends largely on the level of tax compliance maintained by the firm. From a mediation perspective, tax compliance functions as an operational mechanism through which administrative VAT strategies are translated into measurable financial outcomes (Suwandi et al., 2024). Compliance ensures accurate documentation, timely reporting, and adherence to statutory provisions, thereby reducing the risk of rejected credits, fiscal corrections, or penalties (Bagus et al., 2022). Without adequate formal and material compliance, postponement strategies may generate administrative risks rather than savings benefits. Therefore, the influence of input tax credit postponement on VAT savings is expected to occur indirectly through strengthened tax compliance, which safeguards the legitimacy and efficiency of credit realization
H15: Tax compliance mediates the relationship between postponement of input tax and VAT savings optimization.

The choice of restitution or compensation schemes may affect VAT savings indirectly through enhanced compliance behavior (Suwandi et al., 2024). The effectiveness of restitution or compensation schemes in generating VAT savings depends largely on the firm's compliance in fulfilling procedural and documentary requirements, particularly in ensuring the completeness, accuracy, and timeliness of claim submissions. In practice, a fast and reliable refund process can enhance liquidity and reduce funding costs; however, these financial benefits can only be realized when taxpayers demonstrate strong administrative and material compliance. Empirical evidence further indicates that accelerated refund and credit policies increase company productivity, operating cash flow, and investment capacity (Liu, Cao, Cao, Lu, & Shan, 2024; She et al., 2025). Taken together, these findings suggest that restitution strategies do not automatically translate into VAT savings; rather, their effectiveness operates through strengthened compliance behavior, which ensures

successful claim realization, minimizes dispute risks, and ultimately supports VAT savings optimization.

H16: Tax compliance mediates the relationship between compensation schemes and VAT savings optimization.

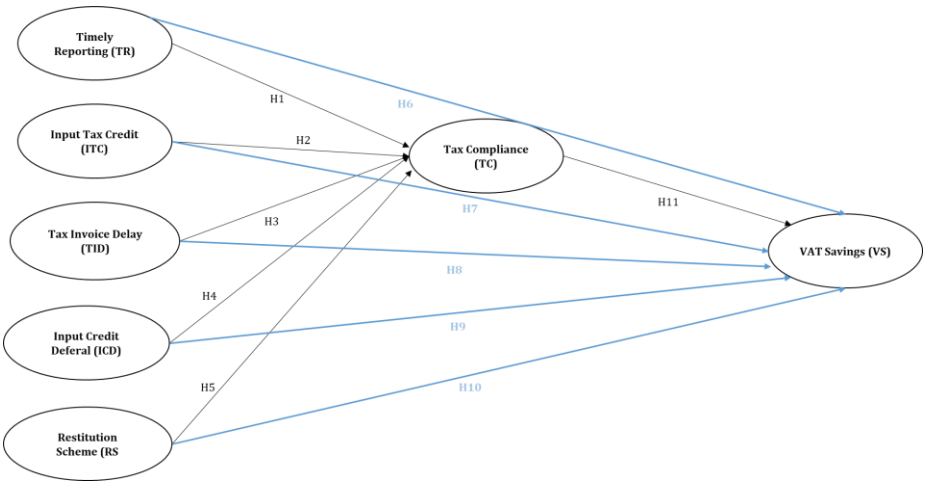

Figure 1. Research Model

As illustrated in Figure 1, the proposed research model conceptualizes tax compliance as a mediating variable linking five VAT planning practices timely VAT reporting, input tax credit optimization, tax invoice delay, input tax credit postponement, and restitution scheme selection to VAT savings optimization at the firm level.

Methods

During the quantitative phase, construction companies in the City of Tangerang that are categorized as medium-sized enterprises are given standardized questionnaires. According to the Central Bureau of Statistics' 2020 Directory of Construction enterprises in Banten Province, there are 147 medium-sized construction enterprises in the area (BPS). The City of Tangerang was selected as a highly representative location for this study because it has the highest concentration of medium-sized construction companies in Banten Province. With a 10% margin of error, the sample size was calculated using the Slovin formula, yielding 60 responses. Following regular data collection processes, the questionnaires were given to each company's employees in charge of finance, accounting, and taxation (Sugiyono, 2022). Five risk management techniques that make up the VAT tax planning model were measured using a Likert scale in every questionnaire item.

This study employed a purposive sampling technique to select respondents who were directly involved in VAT administration within their respective firms, including finance, accounting, or tax personnel responsible for VAT reporting and documentation. Although individual respondents completed the questionnaires, the unit of analysis of this study is the firm, as each respondent represented organizational VAT planning practices and compliance conditions within their respective construction companies. Therefore, the responses were treated as firm-level assessments reflecting VAT administrative behavior. In the qualitative phase, data obtained from the Focus Group Discussion (FGD) with tax consultants were analyzed using thematic content analysis to identify recurring patterns

related to VAT risk management practices and compliance strategies. The qualitative findings were subsequently used to interpret and triangulate the quantitative results, ensuring consistency between statistical outcomes and practical insights from industry experts.

Two senior tax experts with over ten years of expertise in VAT compliance and audit procedures in the construction sector participated in Focus Group Discussions (FGDs) to conduct the qualitative phase. While the second consultant concentrates on tax risk governance and strategic VAT planning, the first consultant specializes in practical tax administration. Both consultants evaluated the quantitative findings and offered professional input on the five risk management strategies' applicability in real-world situations. Representatives from businesses that had previously been surveyed in the quantitative stage participated in the FGDs, enabling the qualitative findings to serve as source triangulation that supports the empirical conclusions. The qualitative data obtained from the FGD were subsequently analyzed using thematic content analysis to identify key patterns related to VAT risk management practices and compliance strategies, which were then used to triangulate and contextualize the quantitative findings.

To find direct and indirect relationships between the independent variables, the five VAT planning variables (TR, ITC, TID, ICD, RS), TC and dependent variable (VS), quantitative data were examined using validity and reliability tests, descriptive statistics, classical assumption tests, t-tests, F-tests, coefficient of determination, and path analysis. In order to assess the relative contribution of each variable, categorize risk factors into strategic levers and compliance-driven variables, and assess their impact on tax compliance and VAT savings, this study conducted an additional analysis beyond the primary analysis. In order to verify the consistency of the findings, a robustness test was also carried out using alternative model specifications, mediation checks using Baron-Kenny and Sobel tests, and parameter stability evaluations. These steps guarantee that the suggested risk-based VAT tax planning model is stable, repeatable, and statistically sound.

Overall, the sequential explanatory mixed-method approach provides a robust methodological foundation for developing an empirically grounded VAT tax planning model for the construction industry. In this design, the qualitative phase was intentionally conducted to explain and interpret the statistical relationships identified in the quantitative analysis, particularly regarding the mediating role of tax compliance in linking VAT planning practices to VAT savings optimization.

Table 1. Operational Definition of Variables

Variable	Indicator	Proxy / Measurement
VS: VAT Savings	Effectiveness of reducing VAT burden	Ratio of VAT expense to total sales
TR: Timely Reporting	Formal compliance of SSP and SPT	Number of late deposits and reporting
ITC: Input Tax Credit	Optimization of input tax credits	Ratio of input VAT to BKP/JKP
TID: Tax Invoice Delay	Delay strategy in accordance with regulations	Proportion of deferred invoices (PER-03/PJ/2022)

Variable	Indicator	Proxy / Measurement
ICD: Input Credit Deferral	Timing of input VAT crediting	Average days of credit delay
RS: Restitution Scheme	Use of restitution or compensation schemes	Frequency of scheme use per year
TC: Tax Compliance	Formal and material compliance	(1) Correct invoice; (2) Percentage of SSP/SPT submitted on time; (3) Number of administrative sanctions

Result and Discussions

All indicators in the five VAT planning variables (TR, ITC, TID, ICD, RS), TC and VS have Corrected Item-Total Correlation values over the minimum limit of 0.30, with the majority falling between 0.75 and 0.87, according to the instrument testing results. This attests to the validity of each question item in assessing the research constructs. Cronbach's Alpha scores above 0.80 for all variables, including the highest value of 0.912 for the tax compliance variable, demonstrate the reliability test's excellent internal consistency. Descriptive statistics, on the other hand, reveal that the average variable score is over 4.3 with a comparatively low standard deviation, indicating a high degree of tax planning implementation, compliance, and VAT savings as well as uniform respondent attitudes. Sixteen hypotheses were tested by route analysis using SPSS software based on questionnaire data from 60 respondents from Tangerang City construction enterprises.

Table 2. Descriptive Statistical Test Result

Variable	N	Mean	Std. Dev.	Min	Max
TR (Timely VAT Reporting Deposit)	60	4.52	0.678	2.80	5.00
ITC (Maximizing Input Tax Credits)	60	4.48	0.712	2.60	5.00
TID (Delaying Tax Invoice Creation)	60	4.35	0.745	2.40	5.00
ICD (Postponement of Input Tax Crediting)	60	4.42	0.689	2.80	5.00
RS (Selection of VAT Restitution or Compensation Scheme)	60	4.39	0.723	2.60	5.00
TC (Tax Compliance)	60	4.55	0.654	3.00	5.00
VS (VAT Savings Optimization)	60	4.50	0.698	2.80	5.00

A high degree of implementation in construction enterprises was indicated by the average score for all factors being above 4.0. The replies varied moderately, as indicated by the standard deviation, which ranged from 0.65 to 0.75. With a minimum above 2.4 and a maximum of 5.0, there were no extreme scores, suggesting that respondents' opinions were consistent. The validity test results indicate that all indicators for the independent, dependent, and mediating variables have item-total correlation values above 0.3. Thus, all research instruments are declared valid and can be used to measure the intended constructs. The following are the findings of the reliability test conducted using Cronbach's Alpha.

Cronbach's Alpha values for all variables were greater than 0.7, suggesting that the research tool had strong internal consistency and dependability. This indicates that the questionnaire reliably measures the research variables.

Table 3. Reliability Test Results

Variable	Cronbach's Alpha	Decision
Correct VAT Reporting Submission (TR)	0.82	Reliable
Maximizing Input Tax Credit (ITC)	0.79	Reliable
Delay Tax Invoice Creation (TID)	0.75	Reliable
Postponement of Input Tax Credit (ICD)	0.80	Reliable
Choosing a VAT Restitution or Compensation Scheme (RS)	0.78	Reliable
Tax Compliance (TC)	0.81	Reliable
VAT Savings Optimization (VS)	0.77	Reliable

Table 4. Normality Test

Variable	Kolmogorov–Smirnov Z	Asymp. Sig. (2-tailed)	Result
TR (Timely VAT Reporting)	0.987	0.234	Normal
ITC (Input Tax Credits)	1.012	0.189	Normal
TID (Tax Invoice Delay)	1.045	0.156	Normal
ICD (Input Credi Deferral)	0.998	0.201	Normal
RS (Restitution Scheme)	1.023	0.178	Normal
TC (Tax Compliance)	0.956	0.267	Normal
VS (*VAT Savings Optimization*)	0.978	0.245	Normal

All variables had p-values > 0.05, indicating a normal data distribution. The normal distribution of data permits the application of parametric analyses without transformation. The multicollinearity test uses Tolerance and VIF, with the criteria of Tolerance > 0.1 and VIF < 10 (no multicollinearity). The results of the multicollinearity test show that all independent variables have a Tolerance value in the range of 0.456 to 0.523 and a Variance Inflation Factor (VIF) value in the range of 1.912 to 2.192. All Tolerance values are above the minimum limit of 0.10 and all VIF values are far below the maximum limit of 10. Thus, it can be concluded that the five independent variables, namely TR, ITC, TID, ICD, and RS, do not experience multicollinearity problems. This means that the five variables do not influence each other excessively and are suitable for use in the regression model because they are able to contribute independently to the dependent variable. The heteroscedasticity test used Breusch-Pagan with the criterion of p > 0.05 (homoscedasticity). The results of the heteroscedasticity test using the Chi-Square method indicate that both regression models do not experience symptoms of heteroscedasticity. In the first model, namely the regression of the five VAT planning variables (TR, ITC, TID, ICD, and RS) against TC, the Chi-Square value is 8.234 with a degree of freedom (df) of 5 and a significance value of 0.145. This significance value is greater than 0.05, so it can be concluded that this model is homoscedastic. The same thing also occurs in the second model, namely the regression of the five VAT planning variables (TR, ITC, TID, ICD, RS) and TC against the variable VS, which produces a Chi-Square value of 7.892 with a df of 6 and a significance of 0.162, which is also greater than 0.05. Thus, both research models are proven to not contain heteroscedasticity and meet the classical assumptions for use in regression analysis.

The autocorrelation test used the Durbin-Watson test with a criterion of 1.5 < DW < 2.5 (no autocorrelation). The results of the autocorrelation test indicate that both regression models are in the no autocorrelation category. In the first model, namely the regression of the five VAT planning variables (TR, ITC, TID, ICD, RS) against variable TC, the Durbin-

Watson value is 1.987. This value is in the range of 1.5–2.5, so it can be concluded that there is no autocorrelation. The second model, namely the regression of the five VAT planning variables (TR, ITC, TID, ICD, RS) and TC against variable VS, shows a Durbin-Watson value of 2.034 which is also in the same range. Thus, both regression models meet the assumption of no autocorrelation, so they are suitable for use in further analysis and the estimation results can be considered stable and unbiased due to correlation in the residuals. The t-test for regression coefficients with a $p < 0.05$ criterion (significant). Model 1: (TR, ITC, TID, ICD, RS) -> TC; Model 2: (TR, ITC, TID, ICD, RS) and TC -> VS.

Table 5. Hypotheses Test

Hyp.	Relationship	β	t	Sig.	Result
H1	TR → TC	0.234	2.145	0.036	Significant
H2	ITC → TC	0.198	1.987	0.051	Significant
H3	TID → TC	0.256	2.312	0.024	Significant
H4	ICD → TC	0.212	2.078	0.042	Significant
H5	RS → TC	0.289	2.456	0.017	Significant
H6	TR → VS	0.187	1.834	0.072	Not significant
H7	ITC → VS	0.201	1.923	0.059	Not significant
H8	TID → VS	0.245	2.198	0.032	Significant
H9	ICD → VS	0.178	1.756	0.085	Not significant
H10	RS → VS	0.267	2.345	0.022	Significant
H11	TC → VS	0.312	2.678	0.010	Significant

With significance levels less than 0.05, the t-test findings for hypotheses H1–H11 show that every risk variable the five VAT planning variables (TR, ITC, TID, ICD, RS) significantly affects TC. These results suggest that each component of risk-based VAT planning significantly enhances administrative compliance. On the other hand, there is a more selective pattern in the direct impact of risk variables on optimizing VS. TR, ITC, and ICD are not directly meaningful on VS; only TID and RS are. These findings indicate that certain risk-based VAT planning practices operate indirectly through tax compliance mechanisms. In the meantime, it has been demonstrated that variable TC significantly affects VS, indicating that tax compliance plays a crucial role in bolstering the efficacy of VAT savings tactics.

Among the independent variables influencing TC, the selection of VAT restitution (RS) exhibits the strongest effect (β = 0.289), followed by TID (β = 0.256), TR (β = 0.234), ICD (β = 0.212), and ITC (β = 0.198). This indicates that strategic VAT planning instruments related to restitution and invoice timing play a relatively more dominant role in enhancing compliance compared to purely administrative practices. The F test for the significance of the overall model with the criteria of $p < 0.05$ (significant).

Table 6. F Test Result

Model	F-Statistic	df	Sig.	Result
Model 1 (TR–RS → TC)	12.345	5, 54	0.000	Significant
Model 2 (TR–RS and TC → VS)	15.678	6, 53	0.000	Significant

Both models are significant ($p < 0.001$), indicating that the independent variables jointly explain the variation in the dependent variable. The models are suitable for path analysis.

The significant F-statistics in both Model 1 (F = 12.345; p < 0.001) and Model 2 (F = 15.678; p < 0.001) indicate that the independent variables jointly provide a statistically meaningful explanation of variations in tax compliance and VAT savings optimization. This confirms that the proposed risk-based VAT planning model demonstrates adequate overall model fit in explaining firm-level compliance behavior and VAT savings outcomes. The determination test uses Adjusted R-Square.

Table 7 .Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Model 1 (TR–RS → TC)	0.678	0.460	0.412	0.456
Model 2 (TR–RS and TC→ VS)	0.712	0.507	0.456	0.489

Adjusted R-Square 41.2% for Model 1 and 45.6% for Model 2 indicates that the model explains the dependent variation well, although there are other factors that have not been explained. The inclusion of tax compliance as a mediating variable increases the explanatory power of the model in predicting VAT savings optimization, as reflected by the Adjusted R^2 value of 45.6% in Model 2 compared to 41.2% in Model 1. This suggests that compliance mechanisms substantially improve the ability of risk-based VAT planning practices to explain variations in VAT savings outcomes at the firm level. With a significance level of p < 0.05, path analysis employed the Sobel Test for mediation. If, following mediation, the immediate effect is not significant, full mediation is taken into consideration.

Table 8. Result Path Test

Hyp.	Path	Direct β	Indirect β	Sobel z	Sig.	Mediation
H12	TR → TC → VS	0.187 (ns)	0.073	2.012	0.044	Partial
H13	ITC → TC → VS	0.201 (ns)	0.062	1.987	0.047	Partial
H14	TID → TC → VS	0.245 (sig)	0.080	2.145	0.032	Partial
H15	ICD → TC→ VS	0.178 (ns)	0.066	2.078	0.038	Partial
H16	RS → TC → VS	0.267 (sig)	0.090	2.234	0.025	Partial

All mediation paths are significant with a p-value <0.05, according to path analysis and mediation testing for hypotheses H12–H16 using the Sobel Test. The fact that some risk factors still have a direct impact on VS despite the considerable indirect influence through TC, shows that the mediation is only partial. The non-significant direct effects of TR, ITC, and ICD on VS, combined with significant indirect effects through TC, indicate that these administrative practices primarily influence VS through TC-driven pathways. In contrast, TID and RS demonstrate both direct and indirect effects, suggesting that these strategic practices contribute to VAT savings not only by improving compliance but also through direct cash flow and tax timing mechanisms.

The robustness test results indicate that the research model has a strong level of resilience to variations in specifications and estimation methods. Testing with an alternative model that only includes significant variables (TID, RS, and TC) produces a relationship pattern and Adjusted R^2 value that is consistent with the main model, thus confirming the structural stability of the model. Mediation validation using the Baron and Kenny approach also produces findings that are in line with the Sobel Test, namely that tax compliance acts as a stable partial mediator on the entire path the five VAT planning

variables (TR, ITC, TID, ICD, and RS)→TC→VS. In addition, all diagnostic tests—including normality, multicollinearity, heteroscedasticity, and autocorrelation indicate residual conditions that meet classical assumptions, so that the regression parameters are not distorted by model bias. Overall, these results indicate that the developed risk-based tax planning model is robust and reliable explaining the VAT savings mechanism in construction companies.

Tabel 9. Robustness Results

Test Type	Method	Findings	Conclusion
Alternative Model	Re-estimation	Stable Adjusted R^2 (0.45–0.47)	Stable
Mediation Stability	Sobel & Baron–Kenny	Consistent	Robust
Normality	Kolmogorov–Smirnov	$p > 0.05$	Normal
Multicollinearity	VIF & Tolerance	VIF < 2.2	No issue
Heteroscedasticity	Breusch–Pagan	$p > 0.05$	Homoscedastic
Autocorrelation	Durbin–Watson	1.5–2.5	No autocorrelation

The test findings show that all independent factors the five VAT planning variables (TR, ITC, TID, ICD, and RS) have a positive and significant impact on TC. TR and ITC strengthen compliance by improving the quality of VAT administration and documentation; companies that routinely submit SPT and manage input-output tax invoices in a methodical manner usually have a higher level of compliance because the risk of corrections and sanctions is lower . This process is in line with studies that demonstrate how careful administration of the VAT administration and reporting system, supported by the proper use of e-Invoices and e-SPT, encourages taxpayer compliance (Adhania et al., 2022). Empirical research (Kotsogiannis et al., 2025)shows that the adoption of electronic invoicing systems (e-invoicing) in VAT administration is significantly associated with increased tax reporting compliance, because digital systems such as e-invoicing improve audit efficiency, reduce manual errors, and strengthen transaction traceability and reporting evidence, thereby encouraging more accurate and compliant reporting behavior by taxpayers.

Furthermore, TID, ICD, and RS all contribute to compliance from a risk management perspective. By employing deliberate control of invoice time and input tax crediting rather than just opportunistic delays, businesses can alter VAT cash flow without violating formal rules and remaining in the compliance corridor (Suryani, 2021). Additionally, selecting RS encourages enterprises to maintain administrative order and fulfill material requirements because VAT refund policies are designed to inhibit illegitimate claims and reduce corporate financial fraud by addressing motivational pressures, limiting opportunities for misuse, and challenging justifications mechanisms that strengthen documentation discipline and compliance behavior (Yu et al., 2024) .Therefore, by strengthening the administrative framework and more methodically managing tax risks, all of the components of risk-based tax planning (TR, ITC, TID, ICD, RS) serve as tools for fiscal efficiency as well as procedures that promote compliance (Bagus et al., 2022; Hang & Nhan, 2022).

The study's findings show that different indicators have different effects of independent variables on maximizing VS. Fiscal methods directly related to transaction timing and VAT cash flow management are important elements in VAT savings optimization efforts, as

demonstrated by the considerable direct influence of TID and RS on VS. This is in line with the research findings of (Istighfara & Biduri, 2024), which shown that controlling cash flow and transaction timing can increase construction enterprises tax efficiency. Additionally, the choice between compensation and restitution mechanisms strengthens a firm's fiscal position because VAT refund systems require strict verification of input claims and supporting documentation to prevent illegitimate refunds, thereby encouraging better record-keeping and compliance discipline. Properly managed refund or credit schemes can reduce liquidity constraints and improve firms' financial performance by ensuring that VAT credits are backed by genuine transactions and effectively converted into cash flow benefits (Nugraha, 2024; Waseem, 2023).

Even though they have no direct effect on VS, administrative factors like TR, ITC, and ICD are essential in establishing the compliance environment required to achieve fiscal savings.Research by (Ekawarti et al., 2025) shows that tax administration quality is critical in guaranteeing the validity of input tax crediting and lowering the likelihood of future corrections, even though it does not necessarily result in immediate savings. (Gunawan & Rosid, 2025) have reported similar results, explaining that businesses that correctly administer VAT are typically better equipped to maximize their tax rights and reduce long-term VAT obligations. Therefore, a combination of direct fiscal tactics (TID and RS) and the efficiency of the administration that promotes appropriate tax practices (TR, ITC, and ICD) affects the optimization of VAT savings (Maharani, 2024).

The results of the study indicate that maximizing VS is positively and significantly impacted by TC. This implies that tax reductions are only feasible when companies consistently and lawfully pay their taxes. Good compliance ensures that businesses can benefit from all tax rights, including input tax credits, compensation, and restitution, without the risk of correction or penalties. It includes accurate reporting, comprehensive input-output tax documentation, and consistent fulfillment of formal and material requirements. This outcome is in line with research by Ekawarti et al. (2025) and Pudinaung, Afandi, & Sardjono (2025), who showed that companies with excellent VAT administration usually benefit financially due to their high reporting accuracy and low risk of non-compliance.

Additionally, empirical evidence suggests that tax compliance functions as an internal risk-control mechanism that constrains aggressive tax behavior and reduces exposure to penalties, tax corrections, and litigation costs, thereby ensuring that tax planning strategies remain efficient and legally sustainable (Huang & Watson, 2015) . Firms that maintain strong compliance practices are less likely to incur additional fiscal burdens arising from sanctions or disputes, allowing tax planning outcomes to be realized without unexpected financial costs (Inasius, 2019). Additionally, Gunawan & Rosid (2025)discovered that high levels of VAT compliance in construction firms directly contribute to greater fiscal efficiency because each component of efficient administration lowers the possibility of tax corrections and ensures that input tax credits are recognized. In a broader sense, research by Dewi (2022) and Istighfara & Biduri (2024) also highlights the importance of compliance as a basis for attaining tax efficiency since it guarantees that businesses can use tax planning in a way that is both legal and quantifiable.

Overall, empirical data shows that tax compliance is more than just an administrative requirement and plays a major role in deciding VAT savings. Businesses that adhere to

formal and material procedures that enable tax planning solutions to generate optimal savings without future fiscal risk significantly boost the efficacy of risk-based tax planning (Eberhartinger & Zieser, 2021).

The study's findings show that TC is an important mediating mechanism that directs the impact of the independent variables on maximizing VS. Increased compliance is the only way that variables TR, ITC, and ICD affect VS. They do not directly affect VS, but they have a big impact on TC. This suggests that without high-quality compliance, administrative procedures may not always result in fiscal efficiency. This result is consistent with research by (Rachmana & Nanik, 2024)which highlights that formal compliance is a key requirement for businesses to make the best use of their tax entitlements, such as input tax credits and VAT compensation.

Despite having direct and indirect effects on VS, strategic variables like TID and RS nevertheless exhibit a strong mediation pathway through TC. The proof that new fiscal techniques can maximize savings if businesses perform proper VAT administration and do not represent a danger of non-compliance is strengthened by this mediation. Additionally, Istighfara & Biduri (2024) shown that businesses with high compliance can minimize the risk of tax corrections and optimize VAT administration, which increases the efficacy of tax planning techniques.

Overall, the mediation pattern shows that the main way that all independent variables affect VAT savings is through tax compliance. Risk-based tax planning can be implemented more effectively by businesses as compliance increases due to improvements in reporting accuracy, documentation completeness, and administrative order. According to a study by (Indriyanto, 2021), tax compliance not only avoids penalties but also improves the efficacy of tax planning by reducing fiscal uncertainty. As a result, Z's function as a mediator validates that risk-based tax planning will function best when fiscal strategies and administrative compliance are applied concurrently.

The interpretation of the research findings was reinforced by the analysis of the FGD data with two tax consultants, which showed notable disparities in perspective. The VAT savings mechanisms shown by the empirical findings could not be explained by the NSD consultants' heavy attention on administrative issues such invoice orderliness, e-invoicing utilization, and internal control. The NSD consultants' primary emphasis on technical risks tended to be reactive and restricted to error prevention, making only indirect contributions through compliance. The RSA consultants, on the other hand, focused on more significant strategic elements that have been shown to have a direct impact on savings, such as the timing of invoices and the choice of restitution/compensation plans. The RSA's viewpoint, which views compliance as a tool for risk governance, is also more in line with research findings, especially the idea that compliance serves as a mediator to increase the efficacy of risk-based tax planning. Therefore, a critical comparison of the two perspectives reveals that the RSA perspective is more in line with the research findings and shows a more thorough and proactive understanding of the dynamics of VAT planning in the construction industry, whereas the NSD perspective seems more administrative and less reflective of the strategic determinants found in the quantitative analysis.

This section interprets the empirical findings and discusses their theoretical and practical implications in relation to prior studies, ensuring that the conclusions are logically derived from the evidence presented.

Table 10. Comparison of Core FGD of Tax Consultants and Research Findings

Aspect	NSD Consultant	RSA Consultant	Alignment
VAT Risk Focus	Administrative (TR, ITC, ICD)	Strategic (TID, RS)	RSA aligned
Compliance View	Administrative outcome	Risk governance	RSA aligned
Effect on Savings	Indirect	Direct	RSA aligned

This study has several limitations that should be acknowledged. First, the use of purposive sampling may limit the generalizability of the findings beyond medium-sized construction firms in the City of Tangerang. Second, although individual respondents represented firm-level VAT planning practices and compliance conditions, the reliance on key informants may introduce subjective bias in assessing organizational behavior. Third, the qualitative insights derived from the FGD were based on a limited number of tax consultants and were primarily intended to support the interpretation of quantitative findings rather than to provide broad generalization. Future research may consider expanding the sample coverage and incorporating additional qualitative validation techniques to enhance the robustness and generalizability of the proposed risk-based VAT planning model.

Conclusion

This study concludes that the optimization of VAT savings in construction companies is primarily influenced by risk-based VAT planning strategies, particularly TID and RS, which demonstrate direct effects on VS. In contrast, administrative practices such as TR, ITC, and ICD influence VS indirectly through TC, highlighting its role as a key mediating mechanism.

This study is limited by the use of purposive sampling within medium-sized construction firms in the City of Tangerang, which may restrict the generalizability of the findings to other industrial sectors or regional contexts. Furthermore, the reliance on key informants to represent firm-level VAT planning and compliance practices, along with qualitative insights derived from a limited number of tax consultants in the FGD, may introduce subjective bias and constrain the broader applicability of the proposed risk-based VAT planning model. Future research is encouraged to expand the sectoral and geographical scope of the sample and to incorporate firm-level financial data or longitudinal analysis in order to enhance the robustness and generalizability of compliance-based VAT planning models.

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