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Preface

Journal of Applied Sciences in Accounting, Finance, and Tax is a forum provided for researchers, both from universities, practitioners and the industrial world. The publication is a result of research, studies or ideas on Accounting, Finance, and Tax.

JASAFINT is published with a focus and scope on issues on Accounting (Financial Accounting, Management Accounting, Public Accounting, Auditing, and Accounting Information Systems), Finance (Capital Market, Financial Statements Analysis, and Financing), and Tax (Income Tax, VAT, Tax Audit, and Tax Accounting).

Managed by the Department of Accounting and published by Politeknik Negeri Bali Research and Community Service Center (P3M-PNB), this journal is intended to disseminate scientific knowledge and the application of the Accounting, Finance and Tax and is expected to be able to broaden the readers' perspective and enrich the scientific repertoire.

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Contents

Determinants of accounting fraud with unethical behavior as an intervening variable in OPD Palembang city government Selvita Meilansari, Dian Ofasari & Tiara Nurpratiwi	62-74
Financial strategy and tax avoidance: the influence of profit, capital structure, liquidity, and firm size as a moderator Tio Waskito Erdi.....	75-88
Digital transformation and its implications for professional accountants' skills needs Ni Putu Rita Sintadevi,I Made Suarta & I Ketut Suwintana	89-101
An Empirical Analysis of Tax Revenue and FDI Influence on GDP in Southeast Asian Countries Florentinho Gomes	102-112
Analysis of capital market reaction to the 2024 Prabowo-Gibran inauguration on Indonesian Stock Exchange I Komang Gita Putra, Kadek Nita Sumiari & Ni Komang Urip Krisna Dewi	113-120
Indonesia's SSB tax policy plan: a review Novrialdi Budi Putra.....	121-130

Determinants of accounting fraud with unethical behavior as an intervening variable in OPD Palembang city government

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ABSTRACT

This study focuses to analyze the effect of internal control, conformity of compensation, information asymmetry and compliance to accounting standards on accounting fraud with unethical behavior as intervening variable in Palembang. This study uses 253 employees of government agencies in Palembang. Primary data is used and processed through structural equation model (SEM) using smartPLS. The result shows that internal control and conformity of compensation have negative and significant effect on unethical behavior, information asymmetry and compliance to accounting standard have positive effect on unethical behavior. However information asymmetry is found to be insignificant. Furthermore, conformity of compensation, information asymmetry and compliance to accounting shows negative and significant effect on accounting fraud meanwhile internal control have positive and insignificant effect. Unethical behavior is found to have positive and significant effect on accounting fraud. The result of sobel test shows that unethical behavior cannot mediate the relationship between internal control, conformity of compensation and compliance to accounting standards on accounting fraud while unethical behavior is also find cannot mediate the effect between information asymmetry on the accounting fraud.

Keywords: Asymmetry, Accounting Fraud, Conformity of Compensation, Internal Control, Unethical Behavior

1. Introduction

The government plays an important role in realizing government goals. To achieve this, good behavior and actions are needed from its employees. However, in practice, there are still many cases of fraud that occur in the government environment. Fraud is a deviant act committed intentionally by individuals or groups to obtain personal or group benefits. Accounting fraud generally includes inappropriate actions in financial management, misuse of assets, or illegal actions that violate trust.

According to the [1], fraud is divided into three types based on its actions, namely asset misappropriation, fraudulent financial statements, and corruption. These actions certainly cause great losses to the company or related institutions. Fraud can occur both in the private sector and the public sector such as in government agencies. Cases of fraud are more common in complex organizational structures, complicated bureaucracy, low integrity of the work environment, ineffective control, and high pressure.

Indonesia is one of the countries also affected by corruption scandals, where in 2023 it stagnated from 2022 Indonesia's score was 34 in the Corruption Perception Index (CPI). Indonesia is now ranked 115 out of 180 countries measured. The increase in Indonesia's Corruption Perception Index (CPI) is influenced by increased public accountability and also corruption prevention which is considered quite effective.

The Palembang City Government obtained an unqualified opinion (WDP), which decreased from the previous year when it received an unqualified opinion (WTP). This predicate in 2022 decreased after 12 consecutive years of obtaining WTP opinion. This is based on the results of the examination of the 2022 Financial Statements.

There are a number of issues that need attention, as noted in the Notes to the Financial Statements. The Palembang City Government reported capital expenditure for networks, roads and irrigation, but the audit revealed irregularities and ineffectiveness in the internal control system. These included lack of verification of proposed activities, selection of unqualified suppliers, inadequate work bundling, lack of external supervision from consultants, and shortages of work volume in 211 activity packages [2].

In recent years, Palembang has become one of the cities involved in corruption cases in South Sumatra. Various cases have attracted public attention to the courts. The South Sumatra High Prosecutor's Office named three employees of the Palembang Primary Tax Office as suspects in alleged corruption cases in fulfilling tax obligations in several companies in 2019, 2020 and 2021. After collecting evidence and evidence, the Special Crimes Investigation Team of the South Sumatra Attorney General's Office named the three people as suspects on October 23, 2023. Then the management of the Palembang Indonesian Red Cross (PMI) grant funds for the 2021, 2022 and 2023 budget years is suspected of corruption. The use of these funds is considered not transparent and is suspected to be for the benefit of someone who has the potential to violate the rules and harm state finances.

Based on [3], the Palembang City Inspectorate is directed to become an internal supervisor of the Regional Government with integrity and excellence in supporting the implementation of good governance within the Palembang City Government. The Inspectorate acts as a driving force for OPDs or work units in Palembang City Government in implementing the principles of good governance, with a main focus on accountability, participation, and transparency.

The Palembang City Government is required to strength the internal control system in order to create clean governance and free from KKN practices. Internal control has an important role in organizations, especially in the government sector, in an effort to minimize the risk of fraud. The implementation of this control is regulated in [4]. However, the Palembang City Government Performance Report reveals that not all OPD heads have implemented the SPIP system. This is due to the limited number of human resources (HR) who are competent in evaluating the performance of all OPDs related to SPIP.

Government institutions are currently also required to improve employee performance in order to improve the quality of public services. Public service is one of the main functions in applying government duties which is the responsibility of government apparatus. Palembang City through [5] in order to improve employee welfare, stipulates the provision of additional employee income according to objective considerations aimed at improving the welfare of civil servants within the Palembang City Government.

Information asymmetry is another factor that can affect the occurrence of accounting fraud. This imbalance occurs when the trust holder (local government / executive) becomes an info provider or agent has more access to information than the trust giver (citizens, community representatives, and legislators) who are information users or principals. In this condition, the principal authorizes the agent to manage the agency he leads.

Palembang Mayor Regulation No. 91 of 2022 concerning the Municipal Government Accounting System (SAPK) [6] regulates government accounting regulations which are a series of mechanisms, devices, and other elements systematically to carry out accounting functions, from transaction analysis to financial reporting. Compliance with these accounting rules is an obligation in the preparation of financial statements. This financial report is a form of accountability of the city government in the implementation of the APBD, but the current Palembang City APBD allocation pattern still does not have a clear direction in supporting the city's priorities and strategic plans, and is less targeted at

strategic content to improve public services. The allocation pattern in the APBD is still largely influenced by changes in legislation.

Unethical behavior also influences the rise of irregularities in Indonesia, especially in Palembang City. In the [7], it is stated that the purpose of this Code of Ethics is to prevent unethical behavior and uphold higher principles compared to other civil servants. This Code of Ethics aims to ensure the principle of accountability and effective audit implementation, so as to form a credible supervisory apparatus with optimal performance in carrying out supervisory duties. Recently, Palembang City civil servants have been in the public spotlight due to increasing cases of code of ethics violations, such as corruption and indiscipline.

In the act of fraud, each individual or perpetrator has different reasons. The fraud triangle theory developed by [8] explains the factors that encourage someone to commit fraud, namely pressure, opportunity, and rationalization. In this theory, each element is represented through certain variables: pressure is represented by the compensation suitability variable, opportunity is associated with internal control variables, information asymmetry, and compliance with accounting rules, while rationalization is reflected in the unethical behavior variable.

Unethical behavior can be explained through various ethical behavior theories that emphasize how individuals make moral decisions in an organizational context. According to the [9] a person's tendency to act unethically is influenced by their attitude towards the behavior, subjective norms, and perceptions of the ease of performing the action. In other words, if an employee views cheating as normal and supported by the work environment, the tendency to behave unethically will be higher.

This research is a reflection of previous research. There are several differences in this study. The first difference is related to the variables used. In this study, the variable of unethical behavior is used as an intervening variable. This variable is an intermediate variable / between the independent variable and the dependent variable, so that the independent variable does not directly affect the change or occurrence of the dependent variable. The second difference lies in the research analysis tool. This study uses the SEM (Structural Equation Model) analysis tool because the model being analyzed is multilevel and relatively complicated, so it will be very difficult to solve with the path analysis method in linear regression and also the error (error) in each observation is not ignored but still analyzed, so SEM is more accurate for analyzing questionnaire data involving perception.

By considering the existing phenomena and limitations, the author seeks to conduct research with the title "Determinants of Accounting Fraud with Unethical Behavior as an Intervening Variable in OPD Palembang City Government".

2. Method

Research Design

The design of this research is the Regional Apparatus Organization (OPD) of the Palembang City Government. The respondents used were all ASN (State Civil Apparatus) staff who served in the Palembang City Government Office. The research implementation time was in September-October 2024

Data Collection Instruments

The type of data used in this research is primary data which is asked through interviews and questionnaires to respondents. The data source is the opinion and perception of the State Civil Apparatus (ASN) in the Palembang City Government Office.

Population and Sample

The population in this study were all Regional Apparatus Organizations (OPD) of the Palembang city government, with a total of 870 OPD. The sampling technique used in this study was nonprobability sampling with purposive sampling method. With the following sample criteria:

1. Position as staff, to avoid bias because respondents in this study provide self-assessment.
2. A minimum working period of 3 years, it is hoped that it will better understand the conditions in the government related to accounting fraud.
3. The last education is at least a bachelor's degree, it is hoped that it is better able to understand the external and internal factors that influence accounting fraud.

From these criteria, the number of samples that met the criteria was 253 OPDs.

Procedure of Data Collection

In this study, the data collection procedures used were questionnaire and interview methods. In this study using a questionnaire that contains statements where a number of alternative answers have been provided with a checklist mark. This research will use a Likert scale of 1-5. Interviews were conducted with the heads of OPDs who have authority over budget management and financial reporting, using face-to-face interviews conducted at the offices of each OPD in Palembang City.

Data Analysis

In this study, data analysis used path analysis, using the Structural Equation Model (SEM). The test tool used is SmartPLS. In testing the hypothesis of this study, it was carried out using the following structural equation model path analysis:

$$Y_1 = \rho_{X_1Y_1}X_1 + \rho_{X_2Y_1}X_2 + \rho_{X_3Y_1}X_3 + \rho_{X_4Y_1}X_4 + \rho_{\varepsilon_1}Y_1$$

$$Y_2 = \rho_{X_1Y_2}X_1 + \rho_{X_2Y_2}X_2 + \rho_{X_3Y_2}X_3 + \rho_{X_4Y_2}X_4 + \rho_{Y_1Y_2}Y_1 + \rho_{\varepsilon_2}Y_2$$

Where:

$\rho_{X_1Y_1}$: the path coefficient of the direct effect of X1 on Y1.
$\rho_{X_2Y_1}$: the path coefficient of the direct effect of X2 on Y1.
$\rho_{X_3Y_1}$: path coefficient of the direct effect of X3 on Y1
$\rho_{X_4Y_1}$: path coefficient of the direct effect of X4 on Y1
$\rho_{X_1Y_2}$: path coefficient of the direct effect of X1 on Y2.
$\rho_{X_2Y_2}$: the path coefficient of the direct effect of X2 on Y2.
$\rho_{X_3Y_2}$: the path coefficient of the direct effect of X3 on Y2.
$\rho_{X_4Y_2}$: the path coefficient of the direct effect of X4 on Y2.
$\rho_{Y_1Y_2}$: the path coefficient of the direct effect of Y1 on Y2.
ε_1 and ε_2	: error
X1	: Internal Control
X2	: Compensation Suitability
X3	: Information Asymmetry
X4	: Accounting Rule Adherence
Y1	: Unethical Behavior
Y2	: Accounting Fraud

Sobel Test

The Sobel test is used to test unethical behavior which is an intervening variable between internal control, compensation suitability, information asymmetry and adherence to accounting rules on accounting fraud. This sobel test is carried out by testing the strength of the indirect effect of the independent variables, namely internal control (X1), compensation suitability (X2), information asymmetry (X3) and adherence to accounting rules (X4) to the dependent variable, namely accounting fraud (Y2) through the mediating variable (intervening) unethical behavior (Y1).

3. Results and Discussion

Description of Research Variables

From the questionnaire that has been filled in by the respondent, the respondent's identity data is obtained. Presentation of data regarding the identity of the respondents here, namely to provide an overview of the personal circumstances of the respondents.

Table 1. Respondent Characteristics

No	Description		Total	Percentage
1.	Age	20-29 year	0	0%
		30-39 year	52	38,51%
		40-49 year	40	29,63%
		≥50 year	43	31,85%
		Total	135	100%
2.	Gender	Perempuan	55	40,74%
		Laki-laki	80	59,26%
		Total	135	100%
3.	Duration of Employment	1-5 year	110	81,48%
		5-10 year	19	14,07%
		10-15 year	6	4,45%
		≥15 year	0	0%
		Total	135	100%

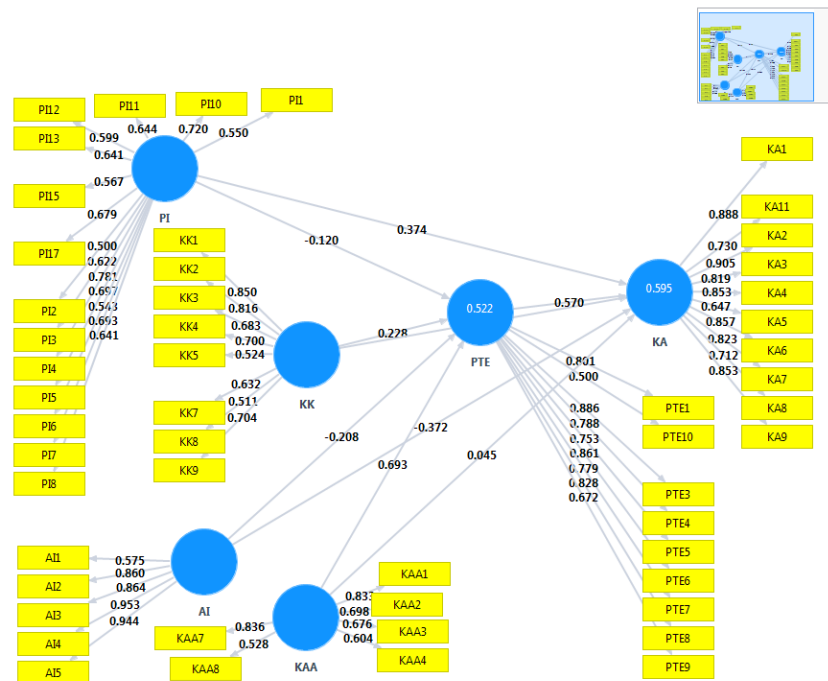
Source: Processed Data, 2025

The number of questionnaires used as a reference for data processing amounted to 253 which had been submitted to the Departments in Palembang City. However, out of 253, only 135 questionnaires could be processed because they met the research requirements because 95 questionnaires were not returned and 23 were incomplete.

Tabel 2. Descriptive Statistics

	N	Minimum	Maksimum	Mean	Modus	Sum	Std. Deviation
KA	135	11	50	39,31	40	5258	8,903
PTE	135	9	45	32,02	36	4282	9,890
PI	135	30	70	54,84	56	7349	7,413
KK	135	20	40	30,26	32	4056	4,511
AI	135	10	25	18,86	20	2528	2,995
KAA	135	12	30	23,97	24	3212	2,867

Source: Processed Data, 2025



Source: Data Diolah

Figure 1. Structural Equation Model (SEM) Test Results

Uji Partial Least Square (PLS) Evaluation Outer Model (Measurement Model)

Uji Convergent Validity Outer Model (Measurement Model) Internal Controls

The internal control variable has 18 indicators consisting of PI1 to PI18. Based on the outer loading assessment of the internal control variable, indicators PI9, PI14, PI16, and PI18 must be removed from the model because they have an outer loading of less than 0.50. The model will be re-estimated by removing indicators with an outer loading of less than 0.5. After re-estimation, all indicators have outer loadings greater than 0.5. The outer loading values are satisfied, so the internal control variable meets the requirements of convergent validity and reliability.

Outer Model (Measurement Model) Compensation Suitability

The compensation suitability variable has 9 indicators consisting of KK1 to KK9. Based on the outer loading assessment of the compensation suitability variable, indicator KK6 must be removed from the model because it has an outer loading of less than 0.50. After re-estimation, all indicators have an outer loading of more than 0.5. The outer loading value is fulfilled so that the compensation suitability variable meets the requirements of convergent validity and reliability.

Outer Model (Measurement Model) Information Asymmetry

The information asymmetry variable has six indicators, consisting of AI1 to AI6. Based on the outer loading assessment of the information asymmetry variable,

indicator AI6 must be removed from the model because it has an outer loading of less than 0.50. After re-estimation, all indicators have an outer loading of more than 0.5. The outer loading value is satisfied, so the information asymmetry variable meets the requirements of convergent validity and reliability.

Outer Model (Measurement Model) Accounting Rule Adherence

The accounting rule adherence variable has 9 indicators consisting of KAA1 to KAA9. Based on the outer loading assessment of the accounting rule adherence variable, indicators KAA5, KAA6, and KAA9 must be removed from the model because they have an outer loading of less than 0.50. After re-estimation, all indicators have outer loadings greater than 0.5. The outer loading values are satisfied, so the accounting rule compliance variable meets the requirements of convergent validity and reliability.

Outer Model (Measurement Model) Unethical Behavior

The unethical behavior variable has 10 indicators consisting of PTE1 to PTE10. Based on the outer loading assessment of the unethical behavior variable, PTE2 must be removed from the model because it has an outer loading of less than 0.50. After re-estimation, all indicators have an outer loading of more than 0.5. The outer loading value is satisfied, so the unethical behavior variable meets the requirements of convergent validity and reliability.

Outer Model (Measurement Model) Accounting Fraud

The accounting fraud variable has 11 indicators consisting of KA1 to KA11. Based on the outer loading assessment, the accounting fraud variable KA10 must be removed from the model because it has an outer loading of less than 0.50. After re-estimation, all indicators have an outer loading of more than 0.50. The outer loading value is fulfilled so that the accounting fraud variable meets the requirements of convergent validity and reliability.

Uji Composite Reliability

The reliability of the research instruments in this study was tested using composite reliability and Cronbach's alpha coefficient. Constructs were declared reliable if the composite reliability and Cronbach's alpha values were above 0.70.

Table 3. Test Results *Composite Reliability dan Cronbachs Alpha*

Variable	Composite Reliability	Cronbachs Alpha
Internal Control	0,905	0,892
Compensation Alignment	0,874	0,859
Information Asymmetry	0,927	0,899
Accounting Rule Compliance	0,853	0,795
Unethical Behavior	0,928	0.912
Accounting Fraud	0,951	0,941

Source: Processed Data, 2025

The test results in Table 3 show that the composite reliability and Cronbach's alpha results indicate satisfactory values, with each variable above the minimum value of 0.70. This indicates a high level of consistency and stability in the instruments used. In other words, all constructs or variables in this study have become suitable measurement tools, and all statements used to measure each construct have good reliability.

Hypothesis Test

To test the proposed hypothesis, the t-statistic value can be seen after data processing. The threshold for rejecting and accepting the proposed hypothesis is when the t-statistic result > t-table 1.96 (Sig=5%) and the suitability of the hypothesis effect (negative or positive), then the hypothesis will be accepted or rejected. The t-statistic results for each variable can be seen in Table 4 as follows:

Table 4. Hypothesis Test Results

Variable	Original Sample	Sample Mean	Standar Error	t-statistics	Hipotesis	Terima/Tolak
PI -> PTE	-0.2281	-0.2038	0.0300	7.6064	H1	Terima
PI -> KA	0.0285	0.0720	0.0314	0.9074	H2	Tolak
KK -> PTE	-0.1999	-0.1961	0.0425	4.7010	H3	Terima
KK -> KA	-0.1098	-0.1273	0.0393	2.7959	H4	Terima
AI -> PTE	0.0033	-0.0207	0.0722	0.0460	H5	Tolak
AI -> KA	-0.1638	-0.1921	0.0264	6.2082	H6	Tolak
KAA -> PTE	0.2578	0.3056	0.0668	3.8614	H7	Tolak
KAA -> KA	-0.0503	-0.0552	0.0112	4.4751	H8	Terima
PTE -> KA	0.5790	0.5764	0.0395	14.6563	H9	Terima

Source: Processed data, 2025

Discussion of Research Results

The Effect of Internal Control on Unethical Behavior

Based on the test results of the parameter coefficients between internal control and unethical behavior, a negative effect of 22.81% (with an original sample value of PI → PTE of -0.2281) is found which is significant, with a t-statistic of 7.6064, which is greater than the critical value of ± 1.977 . Therefore, the first hypothesis (H1) is accepted. From these results it can be concluded that internal control has a negative and significant effect on unethical behavior.

This means that the higher the level of effectiveness of internal control in government agencies, the less likely a person is to engage in unethical behavior. However, other factors, such as the environment within government agencies, can also play a significant role in influencing this behavior. This finding is supported by previous research conducted by [\[14\]](#).

The Effect of Internal Control on Accounting Fraud

The second hypothesis suggests that internal control has a negative effect on accounting fraud. However, the test results of the parameters between internal control and accounting fraud show a positive effect of 25.7% (with an original sample value of PI → KA of 0.0257), but it is not significant because the t-statistic is 0.9074, which is smaller than the critical value of ± 1.977 . Therefore, the results of this study reject the second hypothesis (H2). The positive internal control coefficient indicates that the higher the level of internal control,

the higher the accounting fraud. The direction of this positive coefficient is contrary to the hypothesis proposed, so the second hypothesis (H2), which states that internal control has a negative effect on accounting fraud, is rejected.

The rejection of this hypothesis proves that effective and sound internal controls do not guarantee the absence of accounting fraud. The rejection of the formulated hypothesis may occur because management decisions may not take into account the possibility of adverse events due to insufficient information, time constraints, or procedures that are not carried out as they should be. The occurrence of collusion within an agency where individuals acting together can commit and cover up fraud so that it cannot be detected by internal controls, as well as a lack of competent human resources to evaluate the performance of all Palembang city OPDs related to internal controls.

The Effect of Compensation Suitability on Unethical Behavior

The test results of the parameter coefficient between compensation suitability and unethical behavior show a negative effect of 19.99% (with an original sample $KK \rightarrow PTE$ value of -0.1999), which is significant with a t-statistic of 4.7010, which is greater than the critical value of ± 1.977 . Thus, the third hypothesis (H3) is accepted. Based on these findings, it can be concluded that compensation suitability has a negative and significant effect on unethical behavior.

This shows that compensation suitability can reduce unethical behavior. When the compensation provided is in accordance with the expectations and satisfaction of managers, management tends to act in accordance with company goals and avoid deviant behavior in order to continue to receive appropriate compensation. This finding is supported by [11], which states that providing appropriate compensation can reduce unethical behavior, perhaps because government officials receive compensation in accordance with their obligations. However, the results of this study contradict the findings of [10], which states that the higher the suitability of the compensation provided, the more unethical behavior in government agencies tends to increase.

The Effect of Compensation Suitability on Accounting Fraud

The results of this study support the fourth hypothesis (H4), which states that compensation suitability has a negative effect on accounting fraud. This finding is supported by the test results of the parameter coefficient between compensation suitability and accounting fraud, which shows a negative effect of 10.98% (with an original sample value of $KK \rightarrow KA$ of -0.1098), which is significant with a t-statistic of 2.7959, which is greater than the critical value of ± 1.977 . Based on these results, it can be concluded that compensation suitability has a negative and significant effect on accounting fraud.

The results of this study indicate that the higher the suitability of compensation received by employees, the lower the possibility of accounting fraud. This is because providing appropriate compensation can provide satisfaction and motivation to employees in carrying out their work, thus encouraging them to provide the best results for the company. With fair and appropriate compensation, employees will feel valued, which in turn will reduce their tendency to commit accounting fraud, such as asset theft or other fraud. Employee welfare that is well cared for through appropriate compensation will minimize these negative actions. This finding is in line with the results of previous research conducted by [1].

The Effect of Information Asymmetry on Unethical Behavior

Based on the test results of the parameter coefficient between information asymmetry and unethical behavior, a positive effect of 0.33% was found (with an original sample AI \rightarrow PTE value of 0.0033), but the effect was not significant because the t-statistic was 0.0460, which was smaller than the critical value of ± 1.977 . Therefore, the results of this study reject the fifth hypothesis (H5), which states that information asymmetry has a positive effect on unethical behavior. Thus, it can be concluded that information asymmetry has a positive, but insignificant effect on unethical behavior.

This shows that the existence of information asymmetry in the agency does not affect employees to behave unethically. Most employees at the Palembang City Office have complied with and implemented the guidelines listed in the Palembang City employee code of ethics as a reference to prevent unethical behavior. Thus, creating a supervisory apparatus that is credible and has optimal performance in carrying out its duties. For employees who violate the code of ethics, the agency will impose sanctions according to applicable regulations. In addition, the basic nature of a person who tends to avoid risk can also be a factor that encourages individuals not to take advantage of existing information asymmetry. However, this finding contradicts research conducted by [10], which states that the higher the level of information asymmetry that occurs, the unethical behavior of government employees will also increase.

The Effect of Information Asymmetry on Accounting Fraud

The sixth hypothesis states that information asymmetry has a positive effect on accounting fraud. However, the test results of the parameter coefficient between information asymmetry and accounting fraud show a negative effect of 16.38% (with an original sample AI \rightarrow KA value of -0.1638), which is significant with a t-statistic of 6.2082, which is greater than the critical value of ± 1.977 . Based on this finding, the sixth hypothesis (H6) is rejected.

The negative direction of the information asymmetry coefficient indicates that the asymmetry that occurs in the agency can actually reduce the possibility of accounting fraud by management. This is thought to be due to the regulation of the Palembang City government in its management governance, as well as the sense of responsibility that employees have for their work, which makes management reluctant to take risks by committing accounting fraud. This finding is consistent with the results of previous research by [5] and [12].

The Effect of Accounting Rule Adherence on Unethical Behavior

Based on the test results of the parameter coefficient between accounting rule compliance and unethical behavior, a positive effect of 25.78% was found (with an original sample value of KAA \rightarrow PTE of 0.2578), which is significant with a t-statistic of 3.8614, which is greater than the critical value of ± 1.977 . The positive direction of the accounting rule compliance coefficient contradicts the formulated hypothesis. Therefore, the seventh hypothesis (H7), which states that adherence to accounting rules has a negative effect on unethical behavior, is rejected. The positive direction of the coefficient indicates that adherence to accounting rules in this institution cannot reduce unethical behavior that occurs.

This is in line with research conducted by [16], which states that the absence of a relationship between ethical behavior and adherence to accounting rules in the tendency of accounting fraud is due to the pressure faced by employees in the finance, planning and reporting departments. This pressure can come from superiors and the surrounding environment, which in these conditions makes employees tend to ignore ethical behavior.

Conversely, the results of this study contradict [11] research, which found that employees' adherence to good accounting rules can actually influence them not to engage in unethical behavior.

The Effect of Accounting Rule Adherence on Accounting Fraud

The test results of the parameter coefficient between accounting rule compliance and accounting fraud show a negative effect of 5.03% (with the original sample KAA → KA value of -0.0503), which is significant with a t-statistic of 4.4751, which is greater than the critical value of ± 1.977 . Based on these results, the eighth hypothesis (H8) is accepted. Thus, it can be concluded that adherence to accounting rules has a negative and significant effect on accounting fraud.

This shows that the higher the level of company compliance with accounting rules, the tendency for accounting fraud to occur can be minimized. This research is in line with the findings of [13], which state that an agency or institution can be involved in fraudulent acts if it does not follow applicable accounting rules. Conversely, if the agency or institution complies with accounting rules, the tendency of accounting fraud can be reduced. However, the results of this study contradict the findings of [15], which states that the higher the level of compliance with accounting rules, the higher the tendency for accounting fraud. This shows that even though someone complies with the rules applied in an agency, they still look for loopholes to commit fraud for personal gain.

The Effect of Unethical Behavior on Accounting Fraud

The test results of the parameters between unethical behavior and accounting fraud show a positive influence of 57.90% (based on the original sample value of PTE → KA with a value of 0.5790) which is significant, with a t-statistic value of 14.6563, which is greater than the critical value of ± 1.977 . Based on these results, the ninth hypothesis (H9) is accepted, which means that unethical behavior has a positive and significant effect on accounting fraud. This finding is in line with ethical theory which states that individual ethical standards can vary from one person to another. These differences in principles and views affect a person's behavior, so that when some people consider fraud as something unnatural, others see it as something that is normal to do.

The results of this study are in line with the findings of [10] which show that unethical behavior has a positive and significant effect on fraud. In other words, the higher the unethical behavior shown by employees, the more likely the employee is to commit fraud.

Sobel Test Results

The results of this study indicate that unethical behavior functions as an intervening variable between internal control, compensation suitability, and adherence to accounting rules on accounting fraud. Based on the results of the Sobel test, a probability value of 6.751 is obtained, which is greater than $= 0.05$, which indicates that unethical behavior acts as an intervening variable between internal control and accounting fraud. Furthermore, a probability value of 4.476 was obtained, which is also greater than $= 0.05$, indicating that unethical behavior serves as an intervening variable between compensation suitability and accounting fraud. Finally, the probability value of 6.751, which is greater than $= 0.05$, indicates that unethical behavior also acts as an intervening variable between accounting rule compliance and accounting fraud.

Based on the results obtained, the probability value for the mediating effect of unethical behavior in the relationship between information asymmetry and accounting fraud is 0.0459 which is smaller than $\alpha = 0.05$. This shows that the variable unethical behavior can mediate the relationship between internal control, compensation suitability, and adherence to accounting rules on accounting fraud partially. However, unethical behavior is unable to mediate the relationship between information asymmetry and accounting fraud.

The results of this study reveal that unethical behavior arising from weak internal control, discrepancies in compensation received, and disobedience to accounting rules provide opportunities for employees to act in accordance with existing norms, which leads to acts of accounting fraud. These fraudulent acts can include corruption, such as bribery, conflicts of interest, unauthorized gratuities, and economic extortion, which ultimately harm the agency.

The results of this study are in line with the findings of [16] which concluded that unethical behavior acts as an intervening variable between internal control and accounting fraud. Unethical behavior shown by employees due to poor internal control can affect the tendency of accounting fraud. However, in this study, unethical behavior did not successfully mediate the relationship between adherence to accounting rules and accounting fraud.

4. Conclusion

Internal control and compensation suitability show a negative and significant influence on unethical behavior in the Palembang City government OPD. Information asymmetry shows a positive but insignificant effect on unethical behavior. Adherence to accounting rules shows a positive and significant effect on unethical behavior. Then compensation suitability, information asymmetry, and accounting rule compliance show a negative and significant effect on accounting fraud. Internal control shows a positive but insignificant effect on accounting fraud. Unethical behavior has a positive and significant effect on accounting fraud. Unethical behavior functions as an intervening variable (mediation) that mediates the relationship between internal control, compensation suitability, and adherence to accounting rules on accounting fraud. However, unethical behavior is unable to mediate the relationship between information asymmetry and accounting fraud.

The limitations in this study use sampling techniques based on Non-Probability Sampling using certain criteria so that the respondents who will be sampled are still limited and the research results cannot be generalized to the entire population.

Future researchers are advised to add other variables that are also related to accounting fraud, such as enforcement of regulations and organizational ethical culture and also to obtain results that are more representative and closer to actual conditions, further research can also expand the research sample not only limited to the Palembang City Office, but also involve other Regional Apparatus Organizations (OPD) such as the Regional Secretariat, DPRD Secretariat, Inspectorate, and other agencies. By expanding the sample, the results obtained will be more significant and can provide a broader picture of the factors that influence accounting fraud in various government agencies.

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Financial strategy and tax avoidance: the influence of profit, capital structure, liquidity, and firm size as a moderator

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ABSTRACT

The purpose of this study is to examine the effect of profitability, capital structure, and liquidity on tax avoidance, with firm size as a moderating factor. This study was conducted on manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period, using multiple linear regression techniques and Moderated Regression Analysis (MRA). The results show a significant effect of profitability on tax avoidance, with firms with higher profits more likely to engage in tax avoidance. Conversely, capital structure does not show a significant relationship with tax avoidance, and debt financing is not a dominant tool for reducing corporate tax liabilities. On the other hand, liquidity shows a negative impact on tax avoidance, indicating that more liquid firms are generally more compliant in fulfilling their tax responsibilities. Furthermore, this study confirms that firm size moderates the relationship between the independent variables and tax avoidance, with larger firms being better equipped to implement complex tax strategies due to their sufficient financial and operational capacity. These findings provide valuable insights for corporate decision-makers, policymakers, and investors, emphasizing the importance of maintaining a strategic yet compliant approach to tax planning.

Keywords: Capital Structure, Company Size, Liquidity, Profit, Tax Avoidance

1. Introduction

Taxes are one of the primary sources of state revenue, playing a crucial role in supporting national development and the provision of public services [1]. As the backbone of the State Budget (APBN), taxes contribute significantly to funding various sectors, including infrastructure, education, health, and security. As the largest source of state revenue, tax revenue remains the primary source of government income [2]. Taxes also play a role in ensuring equitable income distribution, reducing economic inequality, and improving the quality of public services accessible to all citizens. However, in practice, not all taxpayers comply with their tax obligations. One phenomenon that frequently occurs is tax avoidance [3], where companies or individuals seek to reduce their tax liabilities by legally exploiting loopholes in tax regulations. Although tax avoidance differs from tax evasion, which is illegal, this practice still has negative consequences for the national economy.

Tax avoidance is a strategy employed by companies to minimize their tax burden by taking advantage of loopholes in tax regulations. This practice has become a major concern for many countries, particularly Indonesia, because tax avoidance is legally permissible. As a result, it can significantly reduce the potential state revenue. According to [4], [5], to lower their tax obligations, companies often utilize tax incentive policies, shift profits to jurisdictions with lower tax rates, or engage in transfer pricing schemes. One example of the impact of tax avoidance in Indonesia was reported in 2020 by the Tax Justice Network, which estimated that the country suffers annual losses of Rp 68.7 trillion due to tax avoidance. It was stated that US\$ 4.78 billion of this amount resulted from corporate tax avoidance in Indonesia.

To measure the level of tax avoidance, various metrics have been used, one of which is the Cash Effective Tax Rate (CETR). CETR is calculated by dividing income tax paid in cash by pre-tax income. This ratio reflects the percentage of pre-tax income paid as cash taxes, providing a clear representation of the tax burden borne by companies. CETR offers insight into how much tax a company actually pays in cash, making it a key indicator in assessing the aggressiveness of its tax strategies. A study by [6] found a declining trend in CETR among companies in the United States. However, this trend can be explained by the growth in pre-tax income, indicating that concerns over increasing tax avoidance may not be entirely accurate if measured solely using CETR. Additionally, [7] suggest that CETR can be influenced by profitability, highlighting the importance of considering other factors that may affect tax avoidance practices. Using CETR as a tax avoidance measurement tool provides a more realistic perspective on the actual tax burden borne by companies. By relying on real cash flow data, CETR enables a more transparent and accurate analysis of the tax avoidance strategies implemented by businesses.

Another factor suspected to influence tax avoidance is profit. Profit represents the positive difference between revenue and expenses over a specific period, reflecting a company's operational success. Generally, profit indicates how efficiently a company manages its resources to generate earnings [8]. Profit plays a crucial role in a company, serving as the primary indicator of financial performance and a key basis for strategic decision-making. A company's profit is directly related to its tax obligations. As a financial performance indicator, profit significantly influences corporate tax decisions. The motivation for tax avoidance is often linked to efforts to minimize tax payments and manage reported earnings. Profitability can be measured using the Return on Assets (ROA) ratio. Several studies have shown that earnings management can be used to reduce taxable income, meaning that the more aggressively a company engages in earnings management, the higher its level of tax avoidance. Research by [4], [9], [10], [11] suggests that the higher a company's profit, the greater its likelihood of engaging in tax avoidance.

ROA reflects a company's efficiency in generating profit from its assets. The higher the profit a company generates, the better its financial position, as profit serves as the primary basis for tax calculation [12]. However, this contrasts with the findings of [13], [14], who found that a high ROA influences a company's tendency to engage in tax avoidance practices. Profit has

a significant impact on corporate tax decisions. Companies with high profits are more likely to seek strategies to optimize their tax payments, whether through tax incentives, tax planning, or even tax avoidance. However, these tax decisions must be made with full compliance with regulations to avoid potential legal risks in the future.

In the business world, tax avoidance is a common strategy used by companies to legally minimize their tax burden. One factor suspected to influence tax avoidance is capital structure. Capital structure refers to the balance between the use of long-term debt and equity in financing a company's assets [15]. One of the benefits of effective capital structure management for companies is tax optimization. The use of debt in capital structure can provide tax benefits through deductible interest expenses, thereby reducing borrowing costs. A company's capital structure can be measured using solvency ratios, such as the Debt-to-Equity Ratio (DER). Companies with a high DER have a greater proportion of debt compared to equity. The interest expense incurred from debt can be deducted from taxable income, thus lowering corporate tax obligations. This may encourage companies to increase their debt as a legitimate tax avoidance strategy. Several studies have explored the relationship between capital structure and tax avoidance, yielding mixed results. [16] found that DER has a significant positive effect on tax avoidance, meaning that the higher the DER, the more likely a company is to engage in tax avoidance. Furthermore, [17], [18] found that capital structure, measured by DER, has a significant impact on tax avoidance, indicating that companies with higher leverage levels tend to be more involved in tax avoidance practices. Conversely, [19] found that DER has no effect on tax avoidance behavior. Similarly, [20], [21] concluded that capital structure does not significantly influence tax avoidance. The impact of capital structure on tax avoidance is a complex issue influenced by various factors. Empirical research has shown inconsistent results, highlighting the need for further studies to gain a deeper understanding of this relationship.

Based on the two previously discussed variables, there are still mixed findings regarding their impact on tax avoidance. Another factor suspected to influence tax avoidance is liquidity. This ratio indicates how quickly and easily a company can convert its assets into cash to pay off its short-term obligations. In other words, liquidity ratios measure a company's ability to meet its immediate financial obligations. Liquidity can be assessed using the CR, which helps companies evaluate their ability to fulfill short-term liabilities. In the context of tax avoidance, companies with a higher current ratio may have greater flexibility in planning tax avoidance strategies. A larger amount of current assets provides companies with the capability to exploit tax loopholes, such as profit shifting between subsidiaries or utilizing available tax incentives, without affecting the cash flow necessary for short-term operations. [4], [22] found that an increase in short-term debt levels can lead to higher tax avoidance by companies. However, [23] suggested that companies with a high CR tend to engage in less tax avoidance. This may be because firms with strong liquidity do not need tax avoidance strategies to enhance their financial performance. Conversely, [24] stated that CR has no significant effect on tax avoidance. Although CR is an important indicator for assessing a company's liquidity, empirical evidence on its influence on tax avoidance remains inconclusive. Some studies suggest that CR does not significantly impact tax avoidance, whereas other factors such as leverage and profitability tend to play a more dominant role. Therefore, further research is needed to gain a deeper understanding of how liquidity, as measured by CR, affects the tax avoidance strategies adopted by companies.

Research on the factors influencing tax avoidance has been widely conducted using various financial variables, such as ROA, DER, and CR. However, previous studies have shown inconsistencies in the relationship between these variables and tax avoidance. For instance, some studies have found that ROA has a positive effect on tax avoidance, while others suggest a negative or insignificant influence. Similarly, the relationship between DER and tax avoidance has yielded mixed results, with some studies indicating a positive effect, while others find no significant impact. In this context, the latest research will introduce firm size as a moderating variable to explore how it influences the relationship between ROA, DER, CR, and

tax avoidance. Firm size is expected to moderate the effects of these financial ratios on corporate tax avoidance practices.

Firm size can influence the relationship between ROA, DER, and CR on tax avoidance due to various factors. Larger companies tend to have more resources and access to sophisticated tax planning strategies. In contrast, smaller companies may have lower flexibility in engaging in tax avoidance due to financial management constraints and stricter oversight from tax authorities. According to Agency Theory, larger firms often have more dispersed ownership structures, which may lead to greater pressure from shareholders to optimize tax payments through specific strategies. By considering firm size, this study aims to provide a more comprehensive understanding of the factors influencing tax avoidance.

Based on the explanations above and previous research findings, there are still inconsistencies in the results, making tax avoidance a relevant topic for further study. This study adds additional factors that are suspected to influence tax avoidance, including solvency, measured using the leverage ratio, and firm size. Companies with high leverage levels typically have larger interest obligations, which can be deducted from taxable income. This creates an incentive for tax avoidance by maximizing debt utilization. Meanwhile, larger firms have more resources and operational complexity, allowing them to more effectively plan and implement tax avoidance strategies. They are also more likely to have stronger internal tax teams and access to advanced tax planning strategies.

Agency Theory

Agency theory assumes the existence of a conflict of interest between shareholders and managers, where managers may seek to maximize short-term profits, including by reducing tax obligations through tax avoidance. In the context of tax avoidance, agency theory highlights the potential conflict between the principal and the agent, which can influence tax-related decisions. The principal expects the agent (management) to maximize corporate profits [25]. This conflict of interest may drive tax avoidance behavior as a means to increase reported net income, which, in turn, can benefit management. Information asymmetry further exacerbates this issue, as managers have greater access to company information compared to shareholders. This allows management to leverage their informational advantage to engage in tax avoidance practices that may not fully align with shareholders' best interests. According to agency theory, individuals tend to act in their own self-interest [26], [27]. Variables such as ROA, leverage, CR, and company size can influence managerial decisions regarding tax avoidance. Agency theory suggests that tax avoidance can arise as a result of conflicts of interest between managers and shareholders. Managers who focus on reducing tax obligations to boost short-term net income may be more likely to engage in tax avoidance strategies.

The Influence of Profit on Tax Avoidance

Companies with a high ROA can be considered successful, as they effectively utilize their assets to generate profits. ROA measures the amount of net income generated from each unit of assets owned by the company. This ratio is crucial as it provides insight into management efficiency in utilizing available resources. A high profit level indicates that a company has the ability to fulfill its tax obligations and is less likely to engage in tax avoidance practices. However, based on agency theory, management that successfully increases profitability may be inclined to engage in tax avoidance to maintain or further enhance the company's net income. This implies that as corporate profits increase, tax compliance is likely to improve, reducing the probability of tax avoidance practices [8], [9], [10].

H1: Profit influences tax avoidance.

The Influence of Capital Structure on Tax Avoidance

The DER is a metric used to assess the extent to which a company relies on debt to finance its assets. This ratio provides insights into the company's financial risk and its ability to meet debt obligations. A high DER can enhance profit potential but also increases the risk of bankruptcy if the company fails to generate sufficient revenue to cover its debt obligations. A company with a high DER indicates that a significant portion of its assets is financed through external

borrowing, whereas a low DER suggests that the company primarily relies on internal funding. Companies with a high DER face higher interest expenses, which reduce their net income. Consequently, lower earnings result in lower taxable income, leading to reduced tax payments. Thus, corporate financing decisions involving debt can effectively lower the amount of taxes paid to the government [28], [29].

H2: Capital structure influences tax avoidance.

The Influence of Liquidity on Tax Avoidance

The current ratio is a financial metric that measures a company's ability to meet its short-term obligations using its current assets. This ratio provides insight into a company's liquidity, indicating how well it can pay off debts that are due in the near future. A company with high liquidity demonstrates that it does not face difficulties in settling its short-term liabilities. One of the company's key obligations is tax payment. A high level of liquidity suggests that the company has no financial constraints in fulfilling its tax obligations, meaning it is less likely to engage in tax avoidance practices. Conversely, companies with low liquidity may struggle to pay taxes to the government, whereas financially stable companies are less likely to face such issues [30], [31], [32].

H3: Liquidity influences tax avoidance.

The Influence of Profit, Capital Structure, and Liquidity on Tax Avoidance

Tax avoidance is a strategy used by companies to minimize their tax burden through legal means. Several factors can influence tax avoidance, including ROA, DER, and CR. ROA measures a company's ability to generate profit from its total assets. A high ROA indicates efficient asset utilization to generate income, which can influence tax avoidance [9]. DER represents the proportion of debt to equity in a company's capital structure. While high debt usage can provide tax benefits through interest expense deductions, it also increases financial risk [4]. Meanwhile, CR reflects a company's ability to meet its short-term obligations. A high CR indicates strong liquidity, providing flexibility in tax planning [30].

H4: Profit, capital structure, and liquidity influence tax avoidance.

The Moderating Effect of Firm Size on the Relationship Between Profit and Tax Avoidance

ROA illustrates a company's efficiency in utilizing its assets to generate profits. Companies with a high ROA demonstrate strong financial performance in generating earnings. However, the relationship between ROA and tax avoidance remains a subject of debate. Some studies suggest that highly profitable companies tend to engage in tax avoidance to maximize net income, while others find that more profitable firms are generally more compliant with tax regulations. Additionally, firm size is considered a moderating factor in the relationship between ROA and tax avoidance. Larger companies may have more resources and capacity to implement aggressive tax planning strategies compared to smaller firms. However, they are also subject to greater public and regulatory scrutiny, which may limit their ability to engage in tax avoidance. Firm size is believed to influence tax avoidance practices, as larger firms have greater ability to manage taxation through tax-saving strategies and exploit regulatory loopholes [33]. Furthermore, companies with larger total assets indicate greater economic stability [34]. Therefore, firm size is expected to moderate the relationship between profit and tax avoidance.

H5: The effect of profit on tax avoidance is moderated by firm size.

The Influence of Capital Structure on Tax Avoidance Moderated by Firm Size

Tax avoidance is a practice carried out by companies to reduce their tax obligations by exploiting loopholes in tax regulations. One of the factors influencing tax avoidance is a company's capital structure, often measured by the DER. DER reflects the proportion of debt to equity in a company's capital structure. Previous studies suggest that capital structure can impact corporate tax decisions, as companies with higher debt levels may have incentives to engage in tax avoidance to take advantage of tax savings from interest expenses. The use of debt in capital structure has tax implications because interest expenses are tax-deductible,

thereby reducing the company's tax burden. However, the relationship between DER and tax avoidance remains debated. Some studies indicate that highly leveraged companies tend to engage in tax avoidance to maximize tax benefits from interest expenses, while others argue that high leverage increases financial risk, making companies more cautious in their tax avoidance strategies [23]. Furthermore, firm size is considered a moderating factor in the relationship between DER and tax avoidance. Larger firms may have greater resources and capacity to implement complex tax planning strategies compared to smaller firms. However, large firms are also subject to greater public and regulatory scrutiny, which may limit their ability to engage in tax avoidance [35]. Therefore, firm size is suspected to moderate the relationship between capital structure and tax avoidance.

H6: The influence of capital structure on tax avoidance, moderated by firm size.

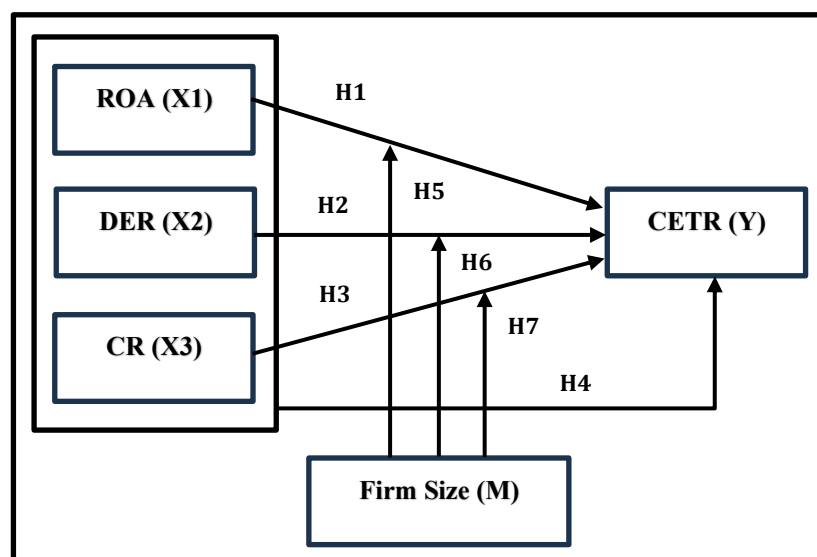
The Influence of Liquidity on Tax Avoidance Moderated by Firm Size

Tax avoidance is a strategy used by companies to legally reduce their tax liabilities. One factor that may influence tax avoidance is liquidity, which is typically measured by the CR. CR represents a company's ability to meet its short-term obligations using current assets [36]. Previous research indicates that liquidity can affect corporate tax decisions, where companies with high liquidity levels are generally better able to fulfill their tax obligations and may feel less need to engage in tax avoidance. Firm size is also considered to influence tax avoidance. Larger companies may have greater resources to engage in complex tax planning; however, they are also subject to stricter regulatory oversight compared to smaller firms [37]. Thus, firm size is suspected to moderate the relationship between liquidity and tax avoidance.

H7: The influence of liquidity on tax avoidance, moderated by firm size.

2. Method

A quantitative study with an associative approach was conducted to analyze the effect of profitability, capital structure, and liquidity on tax avoidance, with firm size as a moderating variable. Multiple Linear Regression analysis was used to examine the effect of ROA, DER, and CR on tax avoidance. MRA was employed to test the role of firm size as a moderating variable.



Source: Processed primary data, 2025

Figure 1. Research Model

The population in this study consists of manufacturing companies listed on the IDX during the 2020–2024 period. The sampling technique used is purposive sampling, based on specific criteria. The selected companies must: (1) belong to the manufacturing sector, (2) have complete financial statements for 2020–2024, (3) have their financial statements audited by a

public accounting firm, (4) present financial statements in Indonesian Rupiah (IDR), and (5) not have incurred losses during the five-year study period. Based on these criteria, a total of 23 manufacturing companies were selected as the research sample for the 2020–2024 period. The regression model equation used in this study is as follows:

$$TA_{it} = \alpha + \beta_1 ROA_{it} + \beta_2 DER_{it} + \beta_3 CR_{it} + e \quad (1) \text{ without moderation}$$

$$TA_{it} = \alpha + \beta_1 ROA_{it} + \beta_2 DER_{it} + \beta_3 CR_{it} + \beta_4 ROA_{it} * UP_{it} + \beta_5 DER_{it} * UP_{it} + \beta_6 CR_{it} * UP_{it} + e \quad (2) \text{ with moderation}$$

TA	= Tax avoidance
α	= Constans
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$	= Regression coefficient of each variable
ROA	= Profits
DER	= Capital Structure
CR	= Liquidity
UP	= Company Size
e	= Error

3. Results and Discussion

Normality Test

The normality test is conducted to assess whether the data used in a study follows a normal distribution. One of the methods for testing normality is the Kolmogorov-Smirnov test. Data is considered to be normally distributed if it has a significance level greater than 0.05. Based on the test results presented in Table 1, the obtained significance level is 0.200, indicating that the data in this study follows a normal distribution.

Tabel 1. One Sample Kolmogorov-Smirnov

Unstandardize Residual	
N	115
Asymp. Sig 2-tailed	0,199

Source: Processed primary data, 2025

Multicollinearity Test

Multicollinearity is a method in regression analysis used to detect the presence of a high linear relationship among independent variables within a regression model. Multicollinearity can lead to invalid regression results, as it makes it difficult to accurately determine the individual impact of each independent variable on the dependent variable. Data is considered free from multicollinearity issues if the Variance Inflation Factor (VIF) is less than 10 and the Tolerance value is greater than 0.1. Based on Table 3, the VIF values for each independent variable are below 10, and the tolerance values exceed 0.1, indicating that the data is free from multicollinearity issues.

Table 2. Multicollinearity Test

Description	Tolerance	VIF	Result
Profits	0,722	1,385	No Multicollinearity Issue
Capital Structure	0,667	1,500	No Multicollinearity Issue
Liquidity	0,861	1,162	No Multicollinearity Issue

Source: Processed primary data, 2025

Heteroscedasticity Test

Heteroscedasticity is a method in regression analysis used to detect whether the variance of residuals (errors) in a regression model is not constant. In classical linear regression assumptions, one of the key requirements is homoscedasticity, which refers to a condition

where the residual variance remains constant across all values of the independent variable. If the residual variance fluctuates, heteroscedasticity occurs, which can lead to inefficient regression results and reduce the reliability of parameter estimation. The Glejser test is used to detect the presence of heteroscedasticity in a regression model. If the significance value is greater than 0.05, it indicates that heteroscedasticity is not present in the model. Based on the obtained results, each variable in this study has a significance value greater than 0.05, meaning that the regression model does not experience heteroscedasticity issues.

Table 3. Glejser Test

Variabel	Sig.
Profits	.065
Capital Structure	.142
Liquidity	.071

Source: Processed primary data, 2025

Coefficient of Determination Test

The coefficient of determination is a measure in regression analysis that indicates the extent to which independent variables can explain variations in the dependent variable. Based on the results obtained, the R^2 value is 0.421, meaning that 42% of tax avoidance can be explained by the variables profitability, capital structure, and liquidity, while the remaining 58% is influenced by other factors outside this study.

Table 4. R^2 Before Moderation

Models	R	R Square	Adjusted R Square
Profits, Capital Structure, Liquidity	.449	.421	.395

Source: Processed primary data, 2025

Next, after incorporating firm size as a moderating variable into the research model, the R^2 value obtained was 0.901, indicating that 90% of tax avoidance can be explained by the variables profitability, capital structure, liquidity, and firm size, while the remaining 10% is influenced by other factors outside the study. The increase in the R^2 value suggests that firm size plays a role in influencing factors related to tax avoidance.

Table 5. R^2 After Moderation

Models	R	R Square	Adjusted R Square
Profits, Capital Structure, Liquidity	.949	.901	.895

Source: Processed primary data, 2025

Hypothesis Testing

Table 6. Hypothesis Testing

Hypothesis	B	Sig	Explanation
Profit influences tax avoidance	1,046	0,013	H1 Accepted
Capital structure influences tax avoidance	-0,028	0,137	H2 Rejected
Liquidity influences tax avoidance	-0,418	0,000	H3 Accepted

Source: Processed primary data, 2025

The linear regression equation is as follows: $TA_{it} = \alpha + \beta_1 ROA_{it} + \beta_2 DER_{it} + \beta_3 CR_{it} + e$. The t-test is a statistical method used in hypothesis testing to determine whether there is a significant difference between the means of two data groups. A hypothesis is accepted if the significance value is < 0.05 , whereas if the significance value is > 0.05 , the hypothesis is

rejected. Based on the test results, the hypotheses for ROA, CR, and firm size were accepted, as their significance values were < 0.05 . In contrast, the hypothesis for leverage was rejected because its significance value was > 0.05 .

Discussion

Profit and Tax Avoidance

The first hypothesis states that profit significantly influences tax avoidance at a 0.013 significance level with a coefficient of 1.046. The positive coefficient indicates that the higher a company's profit, the greater its tendency to engage in tax avoidance. This aligns with the theory that firms with substantial profits will seek strategies to minimize their tax burden in order to maintain profitability. Therefore, the first hypothesis in this study is accepted. Higher profits lead to increased tax obligations payable to the government. Based on agency theory, which explains the relationship between company owners and management, conflicts of interest may arise when management makes decisions that do not align with shareholders' interests [4]. However, there are risks associated with aggressive tax avoidance strategies. If management focuses excessively on reducing tax liabilities without considering reputational or legal risks, it may act against the long-term interests of shareholders. In this regard, agency theory highlights the importance of transparency and accountability in tax decision-making. In this context, management may engage in tax avoidance behavior, as evidenced by companies with high profits not necessarily paying higher taxes but instead reducing their tax obligations. Therefore, even though high profits reflect strong company performance, tax avoidance practices remain prevalent. These findings are consistent with previous research that reported similar results [10], [33], [38], [39].

Capital Structure and Tax Avoidance

The second hypothesis suggests that capital structure does not influence tax avoidance at a 0.137 significance level with a coefficient of -0.028. These results indicate that capital structure does not significantly impact tax avoidance. Although theoretically, debt usage can create a tax shield (tax protection through interest expenses), in this study, the effect is not statistically significant. This may be due to variations in tax regulations or financial strategies applied by the sampled companies. Therefore, the second hypothesis is rejected. A larger capital structure does not necessarily influence a company's efforts to avoid taxes. This may be because management tends to be more conservative in financial reporting, especially for operational activities involving large amounts of debt [40]. Furthermore, research conducted by [41] found that leverage does not significantly affect earnings quality, which serves as a proxy for tax avoidance practices. If a company primarily uses debt for operational activities, its impact on tax avoidance may be minimal. In this case, debt is not utilized as a tool for tax avoidance. While interest expenses can be deducted to reduce taxable income, companies with high leverage tend to pay lower taxes. However, agency theory states that highly leveraged firms aim to maintain their current earnings levels, leading to lower tax avoidance tendencies. These findings align with previous [19], [29], [40], [42], [43].

Liquidity and Tax Avoidance

The third hypothesis states that liquidity significantly influences tax avoidance at a 0.000 significance level with a coefficient of -0.418. This result indicates that liquidity has a significant and negative impact on tax avoidance. In other words, the higher a company's liquidity, the lower its tendency to engage in tax avoidance. This may occur because highly liquid companies have more cash available to fully meet their tax obligations, reducing the need for tax avoidance strategies. Therefore, the third hypothesis in this study is accepted. High liquidity levels provide financial flexibility, allowing companies to engage in strategic tax planning. Companies with strong liquidity have more resources to develop and implement tax avoidance strategies, which in turn lowers their CETR. According to [24], companies with high liquidity tend to comply with tax regulations. They have sufficient resources to pay taxes on time and in accordance with legal requirements, reducing their risk of being subjected to tax audits or penalties. [22] found that CR significantly influences tax avoidance, suggesting that

highly liquid firms are more likely to engage in tax avoidance. This can be explained by the fact that financially stable companies have more flexibility and resources to plan complex tax strategies. From the perspective of agency theory, tax avoidance can be a means of increasing net profit and ROA, ultimately enhancing firm value. However, management must also consider the reputational and legal risks associated with aggressive tax avoidance. When a company has a high CR, it possesses more available resources, which can be utilized for tax avoidance planning. However, management must weigh the costs and benefits of such strategies. If the costs of implementing tax avoidance outweigh the benefits or pose significant risks, the company may opt not to engage in tax avoidance. These findings are consistent with previous research [5], [7], [44].

F-Test

The F-test is conducted to assess whether the independent variables as a whole have an influence on the dependent variable. Based on the results obtained, the significance level is $0.000 < 0.05$, indicating that Hypothesis 4, which states that profitability, capital structure, and liquidity influence tax avoidance, is accepted. Overall, profitability, capital structure, and liquidity have a significant impact on tax avoidance, although the strength of their relationships varies depending on company policies and the prevailing regulatory environment. Companies with high profitability tend to engage in tax avoidance to reduce their tax burden, while a debt-based capital structure provides tax incentives that encourage the use of tax shield strategies. On the other hand, high liquidity offers flexibility in tax management, although it is not always directly related to the aggressiveness of tax avoidance. These findings are consistent with previous research conducted by [4], [10].

Table 7. F-Test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	8622,898	1	2874,299	7,984	0,000
Residual	39953,589	111	359,942		
Total	48576,489	114			

Source: Processed primary data, 2025

Moderation Test

The moderation test in SPSS aims to examine whether a moderating variable can strengthen or weaken the relationship between an independent variable (X) and a dependent variable (Y). This test is commonly used in interaction regression analysis. The moderation test in this study was conducted using Moderated Regression Analysis (MRA). The results of the moderation test are presented below.

Table 8. Moderation Test

Hypothesis	B	Sig.	Result
Profits	5.411	0.347	
Capital Structure	0.286	0.461	
Liquidity	-1.893	0.365	
The effect of profit on tax avoidance is moderated by firm size	0.153	0.024	H5 Accepted
The influence of capital structure on tax avoidance, moderated by firm size	0.004	0.025	H6 Accepted
The influence of liquidity on tax avoidance, moderated by firm size	0.690	0.000	H7 Accepted

Source: Processed primary data, 2025

The linear regression equation is as follows: $TAit = \alpha + \beta1 ROAit + \beta2 DERit + \beta3 CRit + \beta4 ROAUPit + \beta5 DERUPit + \beta6 CR*UPit + e$.

A coefficient of 0.153 with a significance value of $0.024 < 0.05$ indicates that the fifth moderation hypothesis is accepted, meaning that firm size moderates the effect of profitability on tax avoidance. Although profitability does not directly influence tax avoidance, its impact becomes significant when moderated by firm size. This suggests that the relationship between profitability and tax avoidance depends on the size of the company. Larger firms tend to have more flexibility in tax planning due to their access to greater resources and more sophisticated tax avoidance strategies. In contrast, smaller firms face limitations in implementing tax avoidance strategies due to restricted access to resources and tighter regulatory oversight. Firm size is commonly measured by total assets, revenue, or the number of employees. Larger firms generally have more resources, better access to information, and more complex tax planning strategies. This enables them to engage in tax avoidance more efficiently compared to smaller firms. [45] found that firm size moderates the relationship between profitability and tax avoidance, with the results indicating that firm size weakens the relationship between profitability and tax avoidance in certain companies.

A coefficient of 0.004 with a significance value of $0.025 < 0.05$ confirms that the sixth moderation hypothesis is accepted, indicating that firm size moderates the effect of capital structure on tax avoidance. Although capital structure does not directly influence tax avoidance, its impact becomes significant when moderated by firm size. This suggests that the size of a company affects how capital structure contributes to tax avoidance strategies. Larger firms may use debt as a tax reduction tool more effectively since they have a higher capacity to handle interest expenses, which can be deducted from taxable income. In contrast, smaller firms may be less inclined to use debt for tax avoidance due to limited access to financing. Firm size plays a critical role as a moderating variable in the relationship between the DER and tax avoidance. Larger companies, with greater access to resources and financial expertise, tend to adopt different tax avoidance approaches compared to smaller companies. Therefore, it is essential for researchers and practitioners to consider firm size when analyzing corporate tax decisions and tax avoidance strategies.

A coefficient of 0.690 with a significance value of $0.000 < 0.05$ confirms that the seventh moderation hypothesis is accepted, meaning that firm size moderates the effect of liquidity on tax avoidance. Liquidity does not directly influence tax avoidance, but its impact becomes significant when moderated by firm size. Larger firms with high liquidity are more capable of engaging in tax avoidance strategies because they have sufficient funds to hire tax consultants or implement more sophisticated tax planning schemes. Conversely, smaller firms with high liquidity may prefer to comply with tax regulations rather than take risks associated with tax avoidance. Larger companies typically have well-equipped financial teams and tax consultants who can develop more effective tax avoidance strategies. If a large company has high liquidity, it is more likely to allocate funds to optimize its tax strategies, such as tax planning or utilizing tax incentives. Understanding how firm size moderates the relationship between liquidity and tax avoidance can help management formulate more effective tax policies suited to their company's characteristics. Further research is needed to explore these dynamics more deeply and provide additional insights for stakeholders in developing optimal tax strategies.

4. Conclusion

Based on the findings of a study conducted on manufacturing companies listed on the BEI for the 2020–2024 period, several key conclusions were drawn regarding the impact of profitability, capital structure, and liquidity on tax avoidance, with firm size as a moderating variable. The results indicate that the higher a company's profit, the greater the likelihood of engaging in tax avoidance strategies. This finding supports agency theory, where management, seeking to maximize net income, may be inclined to adopt tax avoidance strategies to optimize corporate profits. The capital structure, measured by the DER, was found to have no significant

effect on tax avoidance. This suggests that while debt financing can create a tax shield through interest expenses, in this case, capital structure is not a primary factor in a company's decision to engage in tax avoidance. It is likely that companies rely more on other strategies to reduce their tax burden rather than leveraging debt utilization. Liquidity, measured by the CR, has a negative and significant impact on tax avoidance, meaning that the higher a company's liquidity, the lower its tendency to engage in tax avoidance. This result indicates that highly liquid companies tend to comply with their tax obligations more diligently than those with lower liquidity, which may be more inclined to avoid taxes to maintain financial stability. Furthermore, firm size strengthens the relationship between profitability, capital structure, liquidity, and tax avoidance, implying that larger companies with high profitability are more likely to engage in tax avoidance strategies compared to smaller companies.

Implications and Recommendations: For management, strategic tax planning is necessary to maximize financial efficiency without violating tax regulations. For government and regulators, stricter monitoring of companies with high profitability and liquidity is essential to prevent excessive tax avoidance practices. For investors and shareholders, understanding how financial factors influence tax avoidance can aid in making informed investment decisions. This study focuses solely on manufacturing companies listed on the BEI, meaning the results may not be generalizable to other sectors. Additionally, the independent variables used in this study are limited, suggesting that other factors may also influence tax avoidance. Lastly, as the data only covers the 2020–2024 period, it may not fully reflect the long-term trends in corporate tax avoidance strategies.

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Digital transformation and its implications for professional accountants' skills needs

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ABSTRACT

Digital transformation brings significant changes to clerical accounting tasks. This research aims to (1) investigate digital technology that has a broad impact on the field of accounting; and (2) identify the skills needed by accounting graduates to enter the workforce in the digital era. The research was conducted with a qualitative approach using a systematic literature review method. In the initial phase, this study identified 40 manuscripts. Based on the selection criteria, this study examined 26 manuscripts about digital transformation related to the skills needs of the accounting profession. Manuscripts come from 21 journals indexed by Scopus Q1 – Q3 and published in the period 2019 – 2024. Digital technologies such as big data and data analytics, artificial intelligence, robotic process automation, blockchain, and cloud-based accounting are having a broad impact on accounting processes and practices. The implications of this impact are the changing role of the accounting profession. A number of new skills, both technical and non-technical, are needed to support the changing role of the accounting profession. Therefore, educational institutions need to prepare accounting graduates with a range of skills, supported by digital skills. Further studies are needed to identify patterns of changes in the role of the accounting profession and its skills requirements.

Keywords: Accountant Professional, Digital Transformation, Digital Technology, Technical Skills, Non-Technical Skills

1. Introduction

Digital technology is a key pillar of the Industrial Revolution 4.0. Various digital technologies have developed, such as automation supported by robotic technology, blockchain, artificial intelligence (AI), cloud technology and various derivative applications [1]. These technologies work together to increase flexibility, productivity, and customization of business and accounting processes. The use of digital technology not only has an impact on clerical accounting tasks, but has a further impact on workforce preparation. Accounting job is one of the professions affected by the advancement of the industrial revolution [2, 3, 4]. Digital transformation is an issue of interest to various groups because it brings significant changes to the accounting field and changes the way accounting professionals work.

Currently, many companies have utilized various digital technologies, not only in the accounting sector, but also throughout the company's operational systems. Digital technology is applied in various fields such as digitizing reporting, daily business activities, project management, up to supply chain operations [5]. Accounting digitalization is also related to the quality of financial reporting, the usefulness of accounting information, and the effectiveness of strategic decisions [6]. The various applications of digital technology cause the work carried out to be more effective and efficient, so that productivity at work also increases.

The use of digital technology has an impact on the role of accountants. Therefore, accounting graduates need to be equipped with various digital technology skills. Information and communication technology (ICT) competency is one of the basic technical skills needed by accounting graduates [7]. To prepare students' skills, accounting education programs are required to include ICT software in accounting courses [5]. Students taking accounting education need to have knowledge and skills about big data & data analytics and cloud accounting so that they are ready to face advances in digitalization [8]. In short, digital technology must be present in the learning process of accounting students.

Studies on digital transformation and its implications for the accounting profession have been reported in previous studies. The focus of many reported studies is related to auditing [3, 9, 10, 11], financial reporting [6, 12], as well as the skills needed in the digital era [13, 14]. Studies on the impact of digital transformation on the preparation of accounting human resources are still limited. The author emphasizes the importance of studies to fill theoretical and practical gaps regarding digital transformation and its implications for preparing the skills of accounting education graduates.

This study aims to demystify digital transformation and identify required skills through a systematic literature review. The choice to conduct research using this method was driven by the opportunity to fill the knowledge gap regarding the relationship between digital transformation and the skills needed for accounting graduates to enter the world of work in the digital era. This research method has been widely adopted by previous researchers [15, 16, 17, 18], because it is able to answer questions that cannot be answered through individual studies.

This research objectives to (1) investigate digital technology that has a broad impact on the field of accounting; and (2) identify the skills needed by accounting graduates to enter the workforce in the digital era. To achieve the study objectives, two research questions were formulated to direct the discussion in this article. The research questions are as follows:

- a. What digital technologies have a broad impact on the field of accounting work?
- b. What skills do accounting graduates need to enter the world of work in the digital era?

This research contributes to building a theoretical framework regarding the impact of digital transformation on accounting professionals and its implications for vocational higher education in preparing graduates to enter the workforce. Furthermore, it contributes to efforts to improve the understanding of vocational accounting education policymakers regarding the relationship between digital transformation and key aspects of accounting that are experiencing disruption. This is crucial for developing strategic and systematic steps to prepare digitally literate accounting human resources, while simultaneously restructuring the accounting education system and curriculum to integrate digital technology skills more broadly.

2. Method

The research was conducted with a qualitative approach using a systematic literature review (SLR) method. SLR is a systematic and structured research method for compiling, evaluating, and synthesizing relevant literature in a particular knowledge domain or research topic [19, 20, 21]. SLR provides a comprehensive and structured overview of existing knowledge in a particular research area so that it can be used as a basis for decision making and further research [22, 23, 24], can answer questions that cannot be answered through individual studies, can identify problems in primary research that must be corrected in further research, and can generate or evaluate theories about how or why phenomena occur [25].

The implementation of SLR in this study adapted the 2020 Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines [25] and several SLR methods in other studies [26, 27, 28]. The application of SLR in this research is divided into three main stages including:

- Phase I – Planning the Review Process
This stage includes determining research questions and objectives, formulating a research outline and developing search criteria. The main source of literature in this research is publications in scientific journals, which are published periodically, are not discontinued, and are indexed in Scopus Q1 – Q4. Articles are written in English and published in the period 2019 – 2024.
- Stage II – Conducting the Review Process
Literature search using the Google search engine. Search and selection of journal articles using the keywords "digital transformation in accounting and auditing", "digital skills for accountants" and similar terminology. Searches are limited to the first 20 search results for each keyword. Data extraction results are tabulated in a spreadsheet. Information collected includes: author's name, year of publication, article title, journal name, volume, number, DOI, journal ranking, number of citations. The final step after obtaining relevant literature is to synthesize various findings from the selected literature. The main goal of data synthesis is to analyze and evaluate various research results from various literature, and choose the most appropriate method to integrate explanations and interpretations of these various findings.
- Stage III – Reporting and Dissemination of Review Results
This stage includes the entire series of article writing, including reporting research results descriptively and conducting discussions. In order to develop the discussion and answer research questions, the author conducted a thematic analysis. This analysis is used to determine the existence of certain themes or concepts in qualitative data.

This research examines 40 search result publications on the Google search engine, using two different keywords. For each keyword, the first 20 publications were taken. The search was carried out on April 1 2024 – April 10 2024. A description of the publication search results is shown in Table 1.

Table 1. Description of publication

Publication Description		Frequency	Percentage
Type of Publication	Articles in Scientific Journal	37	92,5%
	Articles in Non-Scientific Journal	3	7,5%
Total		40	100%
Year of Issued	2019	12	32.4%
	2020	7	18,9%
	2021	10	27,0%
	2022	5	13,5%
	2023	2	5,4%
	2024	1	2,7%

	Total	37	100%
Journal Rankings	Scopus Q1	15	40,5%
	Scopus Q2	16	43,2%
	Scopus Q3	1	2,7%
	Scopus Q4	0	0,0%
	Non-Scopus	5	13,5%
	Total	37	100%

Source: Processed research data

Based on the predetermined search criteria, there were 8 (20%) publications that did not match. Three book publications and five scientific publications are not indexed by Scopus. Thus, this research reviewed the literature of 32 (80%) journal articles, with an average of more than 125 citations.

Table 2. Name of author, year of publication, and title of scientific article aligned with research questions.

Authors and Year of Issued	Article Title
[8]	Integrating technology and data analytic skills into the accounting curriculum: Accounting department leaders' experiences and insights
[13]	Digital technology and changing roles: a management accountant's dream or nightmare?
[16]	Blockchain and its implications for accounting and auditing
[2]	Future-proofing accounting professionals: Ensuring graduate employability and future readiness
[29]	The effects of personality traits on digital transformation: Evidence from German tax consulting
[30]	An investigation into the development of non-technical skills by undergraduate accounting programmes
[1]	The Future of Accounting: How Will Digital Transformation Impact the Sector?
[31]	Balancing skills in the digital transformation era: The future of jobs and the role of higher education
[32]	Accountant as Digital Innovator: Roles and Competencies in the Age of Automation
[6]	Digital Accounting, Financial Reporting Quality and Digital Transformation: Evidence from Thai Listed Firms
[33]	The Impacts of Emerging Technologies on Accountants' Role and Skills: Connecting to Open Innovation—A Systematic Literature Review
[34]	Determinants of 21st-century digital skills: A large-scale survey among working professionals
[35]	Accountants' postures under compulsory digital transformation imposed by government oversight authorities
[18]	The digital transformation of corporate reporting – a systematic literature review and avenues for future research
[3]	The digital transformation of external audit and its impact on corporate governance
[36]	The disruptive and transformative potential of new technologies for accounting, accountants and accountability: A review of current literature and call for further research
[37]	The role of internet-related technologies in shaping the work of accountants: New directions for accounting research
[38]	The role of business analytics in the controllers and management accountants' competence profiles: An exploratory study on individual-level data

[9]	Digital transformation and the public sector auditing: The SAI's perspective
[10]	Assessing the impacts of digital transformation on internal auditing: A bibliometric analysis
[39]	Investigating Accountants' Resistance to Move beyond Excel and Adopt New Data Analytics Technology
[11]	Impacts of digitization on auditing: A Delphi study for Germany
[14]	Exploring the impact of 4IR on skills and personal qualities for future accountants: a proposed conceptual framework for university accounting education
[40]	Emerging digital technologies and auditing firms: Opportunities and challenges
[4]	Digital transformation and accountants as advisors
[41]	A Study on the Transformation of Accounting Based on New Technologies: Evidence from Korea

Source: Processed research data

The next step, in order to develop the discussion and answer research questions, the author conducted manual content analysis. Content analysis is used to determine the presence of certain words, themes, or concepts in qualitative data.

3. Results and Discussion

This research aims to (1) investigate digital technology that has a broad impact on the field of accounting; and (2) identify the skills needed by accounting graduates to enter the workforce in the digital era.

Digital Technology in the Accounting Field

The first research question concerns what digital technologies have a broad impact on the field of accounting. To answer this research question, researchers used a digital technology cluster which includes cloud computing & technology, automation & robotics, blockchain, artificial intelligence, big data & data analytics, internet of think, and accounting software and other technology. A resume of digital technology searches discussed in selected journal articles is shown in Figure 1.

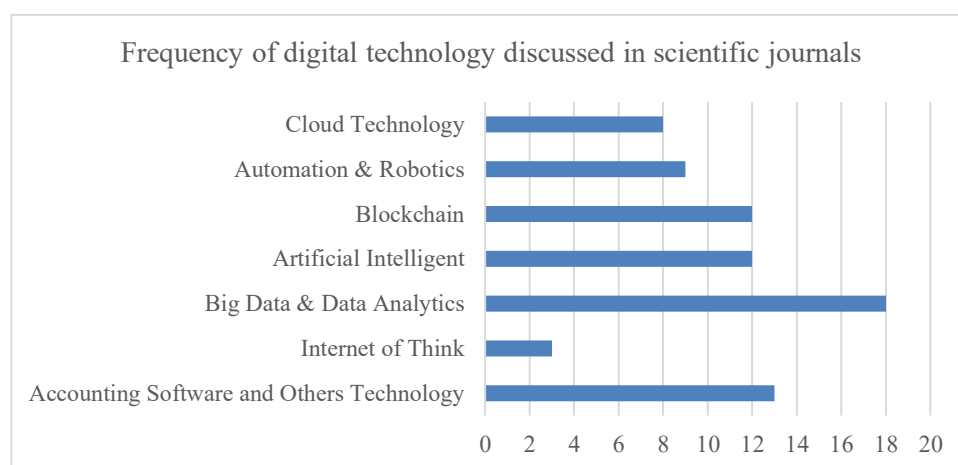


Figure 1. Resume digital technology in accounting field

Big data & data analytics, accounting software, blockchain, automation & robotics, and cloud technology are types of digital technology that are widely discussed in journal articles.

This indicates that this technology has a broad impact on the accounting field. Digital transformation has become an interesting issue for various groups because it brings significant changes to the accounting field. Digital transformation in the accounting field refers to the integration of digital technology into various aspects of accounting processes and practices to improve efficiency, accuracy and decision making [1]. Research findings show that areas of accounting that are significantly impacted by digital transformation include: digitalization of accounting processes and practices, automation of clerical tasks, audit processes, financial reporting, and decision making.

The development of accounting software and cloud technology has given rise to cloud accounting technology. Some software is cloud-based, such as ERP, SAP Accounting Software, Xero Accounting System, Zahir Accounting, and Quickbooks [42]. This technology has become the main tool in digitizing accounting processes and practices as well as automating routine tasks [1, 41]. The emergence of cloud-based accounting software is changing the role of the accounting profession from carrying out clerical tasks to strategic tasks. In this way, there will be plenty of time for the accounting profession to contribute to the company's progress. In the future, the role of accountants will shift as advisors in companies [4]. Accountants as advisors are a valuable strategic resource because of their unique ability to combine generic human resources with digital human resources and social capital resources.

The use of blockchain technology in accounting can offer better audit solutions, automated control and data reliability. Automation in recording and processing transactions can reduce costs and human errors. In addition, it can avoid manipulation and fraud and enable instant information sharing and improve information integrity [16, 41]. It is believed that digitalization of the audit process can increase the role of audit in governance mechanisms. The application of new technologies such as robotic process automation (RPA) and artificial intelligence (AI) has a positive impact on auditors because they focus more on value-added activities [40]. Digitalization and automation are beneficial for auditors in the audit planning process, analytical review procedures, materiality assessment, internal control evaluation, risk assessment, and business continuity decision making [17]. Other researchers also state that digitalization will give rise to new auditor profiles which will enable the creation of a culture of innovation in the audit process [3]. In this ever-evolving environment, auditors need to complement their professional knowledge and audit practices with information technology and data analytics skills, as well as develop ways of critical thinking and analyzing information.

The impact of digital technology on corporate reporting processes is also examined from various perspectives, including for corporate information management, sustainable reporting practices, and accountability and transparency [18]. Apart from that, digital transformation in the small and medium enterprise sector is also studied by other researchers [1]. In the government sector, local government accountants are usually forced to adopt digital innovations to meet the requirements of top-down public financial management reforms [35]. In this context, the success of digital transformation depends on adopting digital processes, having a digital mindset, developing a digital culture, and mastering digital knowledge and skills [12]. These various impacts need attention to ensure digital transformation can run well.

Important skills for accounting graduates in the digital era

The second research question is about the skills needed by accounting graduates to enter the digital age world of work. To answer this research question, researchers used a skills cluster which includes accounting competencies, digital skills, generic skills, personal attributes, and other types of skills. A summary of the types of skills and competencies discussed in the selected journal articles is shown in Figure 2.

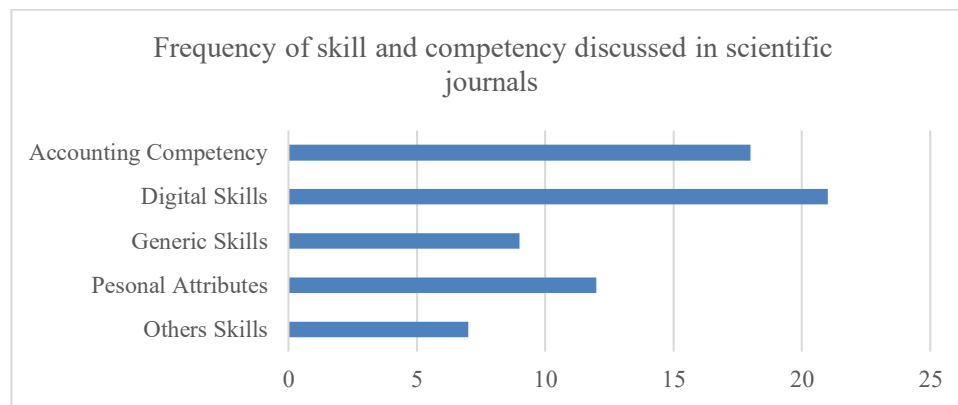


Figure 2. Resume of skills and competencies

In line with the title of this study, accounting technical competencies and digital skills are the main topics of discussion in journal articles. Accounting technical competencies and skills include: general accounting, auditing (internal and external), financial accounting, management accounting, government accounting, fraud detection, taxation, business management and risk management. Digital transformation has an impact on business models and strategies. Conventional business models and strategies have been abandoned. Referring to research [14], there are two business skills for future accountants, namely: (1) consulting and business advisory skills; and (2) strategic thinking. Changes in business models make the accounting profession a business partner and internal consultant [13, 4]. Knowledge and technical accounting skills such as general accounting, auditing, financial accounting, management accounting, government accounting, fraud detection, taxation, business management and risk management are the main capital to be able to play the role of a business consultant.

Digital skills include various types of skills to support the use of digital technology such as cloud computing & technology, automation & robotics, blockchain, artificial intelligence, big data & data analytics, and accounting software. The main types of digital skills discussed include IT basic knowledge, digital business skills, big data and data analytics, data visualization, database and programming skills, and Microsoft Office skills. Referring to research [14], digital skills are divided into: (1) basic digital skills; (2) advanced digital skills; and (3) data skills. Basic digital skills relate to core technologies that have been widely adopted and used by the accounting profession. Included in this category are cloud-based accounting technology, ERP, spreadsheets, Business Intelligence applications, and digitalization of tax reporting activities [17, 40]. The currently developing digitalization phenomenon requires the accounting profession to understand cloud-based applications and be able to carry out real-time online reporting [14]. Advanced digital skills relate to the development of artificial intelligence (AI), blockchain, and advanced BI applications in various accounting sectors [16, 41]. Additionally, programming such as Python, R, and SQL are identified as specialized skills but can be considered part of the advanced digital skills category [14].

Digital transformation in business implies the expectation of using large amounts of financial and non-financial data in decision making. Thus, accountants are expected to be able to handle, organize and audit various data. This ability is related to data skills [14]. These types of skills are considered key skills for success in the workplace. Skills such as the ability to analyze using business intelligence, data analysis, and exploration techniques, as well as synthesizing and interpreting multiple sources are some of the key skills required by employers [1]. Data management and data analysis are the two data skills that appear most frequently in publications.

In addition, generic skills and personal attributes are also topics of discussion in journal articles. Generic skills, also known as transferable skills, are abilities and competencies that are

valuable across various jobs and industries. These skills are not specific to a particular career path but are useful in almost any work environment. Generic skills that are widely discussed include: analytical and thinking skills, problem solving skills, creativity and innovation skills, collaboration and relationships, communication skills, self-management and learning skills, organizational and leadership skills. These generic skills are highly valued by employers because they enhance an individual's ability to perform effectively in various roles and contribute to organizational success. Developing these skills can improve employability and career advancement opportunities. Future accountants will play a role in innovation, creativity, improvisation and other strategic thinking supported by data analytics capabilities so that they can provide added value to organizations [32, 33]. The shift in the role of accountants to become more actively involved in the decision-making process requires them to have a broader understanding of the business environment.

Generic skills are increasingly recognized as important in the dynamic world of work, complementing the technical skills possessed by the accounting profession [2]. Historically, it was technical accounting skills that were required for career work in accounting. However, in today's rapidly changing environment, interpersonal skills are needed more than ever as the accounting profession transitions from technical activities [43]. Employers place more emphasis on generic skills of graduates such as interpersonal and communication skills, including the ability to adjust and adapt to the company's organizational culture [42]. The increasing importance of generic skills has also been identified by research conducted by several international accounting professional bodies [44, 45, 46]. Communication, teamwork, time management and problem solving skills are identified by employers as key prerequisites for recruiting accounting graduates [2]. Along with the importance of technical skills, there is an increasing demand for generic skills that industry expects accounting graduates to have.

Personal attributes, often referred to as personal qualities or characteristics are the traits that define an individual's personality and behavior. These attributes can significantly influence how a person interacts with others, approaches tasks, and navigates various aspects of life. Personal attributes that are widely discussed include: honesty and integrity, openness and adaptability, ethics and social responsibility, and personality traits. These attributes can be innate or developed over time through experience and conscious effort. They play a crucial role in personal and professional success, shaping how individuals are perceived by others and how they navigate their environment.

Ethical issues for the accounting profession have become a major concern amidst rapid technological advances in the era of industrial revolution 4.0. The use of artificial intelligence technology to automate accounting tasks and assist decision making through predictive analysis raises concerns about the implications of data misuse and its impact on internal and external stakeholders [47]. It is important for accountants to have determination in carrying out their professional duties. Apart from that, the emergence of a number of accounting scandals is a reason for the importance of professional ethics [22]. It is not surprising that the application of new technology, such as advanced analytics, facilitated by big data, raises a number of ethical implications for the accounting profession.

The International Federation of Accountants has responded to the increasing importance of ethics by continuing to update and strengthen the code of ethics and professional behavior for its members. In line with this, a framework for accountant ethical skills is proposed which includes: (1) technical ethical skills; and (2) interpersonal skills [45]. Apart from having technical ethical skills, the accounting profession also needs to have a number of interpersonal ethical skills. This type of skill includes the ability to act critically, for example in terms of the quality of data used and produced by digital technology, as well as the ability to act to safeguard company data [44, 46]. Accounting professionals need to develop the technical skills to understand how complex automation models work in order to be able to evaluate the potential ethical implications of the assumptions used in the automation process. There are a number of other capabilities that are also discussed, such as technological innovation, knowledge of

international standards and industry-specific regulations, global citizenship, and customer focus. These skills are needed to broaden the horizons of the accounting profession.

4. Conclusion, Implication and Limitation

Digital technology is applied in various aspects of accounting processes and practices, such as digitizing company reporting, company information management, decision-making processes, and audit processes. Big data & data analytics, artificial intelligence, robotic process automation, blockchain, and cloud accounting are types of digital technology that have a broad impact in the accounting field. Digital transformation changes the role of accountants from carrying out clerical tasks to strategic tasks. Digital transformation has brought about changes in accounting tasks which have implications for the types of skills required of an accountant. A number of new skills, both technical and non-technical, are needed to support the changing role of the accounting profession. This shift in role needs to be anticipated by educational institutions by preparing a number of skills, both technical and non-technical, supported by digital skills. Generic skills and personal attributes have become an interesting issue amidst the rapid advances in digital technology.

The practical implications of this study are on the scientific debate about digital transformation and its implications for the preparation of professional accountant skills. The main issues of the impact of digital transformation on accounting processes and practices, as well as audit processes make us aware of the need to change. Digital transformation cannot be considered a voluntary choice. These changes require universities to change and modify their curricula and educational programs along with automation and digitalization.

The limitations of this research relate to the scope of the literature analyzed. Even though digital transformation is global, there is still little scientific research and academic studies regarding the application of digitalization in accounting and its impact on the accounting profession, especially in developing countries like Indonesia. This study adopts more research conducted by foreign researchers.

This study recommends that further research be carried out through surveys and in-depth interviews to gain knowledge about the changing role of accountants in the digitalization and automation environment. In addition, the use of digital technology such as artificial intelligence, blockchain, big data and cloud accounting needs to be further studied for its implications on accounting processes and practices from the perspective of companies of different sizes (micro, small, medium and large). Apart from that, it is also necessary to study the acceptance and use of digital technology, especially in micro, small and medium scale businesses.

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An empirical analysis of tax revenue and FDI influence on GDP in Southeast Asian Countries

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ABSTRACT

This study examines the effect of tax revenue and FDI on Gross Domestic Product of nations in Southeast Asia covering 2009- 2023. The objective is to determine whether higher tax collection and increased FDI inflows significantly influence GDP performance in the region. Southeast Asia, with its dynamic economic transitions and growing global integration, provides a relevant context for assessing the roles of fiscal capacity and external capital in supporting economic development. The study uses a quantitative method based on secondary panel data gathered through the World Bank, IMF e-Library, CEIC and YCharts platforms. The examination was conducted in STATA 17, using common, fixed, and random effects models for assessing how the variables are related. Results indicate a strong link between tax revenue and GDP, significant at the 1% threshold. FDI also demonstrates a significant positive effect, at the 5% level. These results show that improving how countries collect taxes and making it easier for foreign investors to invest can help boost overall GDP performance. The study also provides governments clear guidance on how better tax policies and investment strategies can strengthen their economies.

Keywords: Foreign Direct Investment, GDP, Panel Data, Southeast Asia, Tax Revenue

1. Introduction

Southeast Asia has developed into a major hub of economic expansion, with a crucial role in worldwide commerce, production activities, and capital flows. Over the past decade, Southeast Asian countries have shown resilience, supported by fiscal expansion and structural reforms. Studies indicate that GDP growth in Southeast Asia has been partly driven by an expanding tax base and consistent FDI inflows [1]. Macroeconomic drivers like average income, trade integration and industrial development are influencing tax revenue [2]. Despite disruptions from the COVID-19 pandemic, Vietnam, Indonesia, Malaysia, and the Philippines experienced a swift recovery due to proactive macroeconomic policies that restored investor confidence [3]. Improvements in infrastructure, labour competitiveness, and regulatory conditions have boosted FDI [4]. Singapore, Thailand, and Brunei Darussalam continue to serve as financial hubs, supported by strong institutions and stable policies [5].

However, structural disparities remain. Cambodia, Laos, Myanmar, and Timor-Leste face challenges such as weak tax administration, limited institutional capacity, and overreliance on natural resources [6],[7]. Political instability and governance issues continue to affect public finance and investor trust [8]. These variations highlight the need for studies that consider both macroeconomic indicators and institutional differences.

This study adopts Public Policy Theory as a framework to analyse the economic role of taxation and foreign capital in Southeast Asia. Public policy is described as an organized framework of government actions created to tackle social and economic problems [9]. Furthermore, it enables strategic allocation of resources and shapes regulatory frameworks [10]. Policy is also viewed as the state's response to external and internal pressures [11]. In this context, countries with transparent and effective institutions are more likely to attract sustainable FDI and mobilize public revenue effectively [12].

Analysing fiscal and investment trends through the lens of policy theory offers insight into how governments manage economic tools to promote growth. Evaluating revenue systems within a policy framework reveals their broader economic effects [13]. Transparency in fiscal institutions has been found to enhance the impact of tax revenue on GDP [14] (Chodorow-Reich et al., n.d.). Similarly, policy-guided tax reforms, such as reduced corporate tax rates, can incentivize private investment [15]. Well-coordinated public policy attracts capital and promotes long-term development [16].

Tax revenue is essential for financing government services and maintaining economic functions [17]. Greater tax revenue also enhances better provision of public services, including health, education, and infrastructure [18], while increased tax income enables public investment that stimulates economic output [19] and contributes to fiscal autonomy [20]. However, overly burdensome tax rates can raise production costs and deter investment, whereas balanced tax policy supports economic activity [21].

Foreign direct investment (FDI) is characterized as sustained capital contributions from foreign entities involving ownership and management control and serves as a strategic cross-border investment [22]. FDI contributes to capital formation and corporate integration in host economies [23], and has emerged as a leading source of external financing in emerging markets [24]. It promotes productivity and employment especially when paired with flexible labor policies [25] and strengthens long-term economic performance through technology transfer and capital deepening [26].

Numerous studies confirm that tax revenue and FDI are each closely linked to GDP: both contribute significantly to long-term national income [27]. Maintaining a tax-to-GDP ratio above 15% promotes economic stability [28], and increasing tax revenue from 7% to 15% of GDP supports expanded social spending [29], which in turn improves human capital [30]. Administrative reforms that raise tax revenue by 3% of GDP can yield sustained growth [31], and the ratio of taxation to GDP continues to serve as an important measure of fiscal capacity [32]. On the FDI side, countries with strong institutions experience more stable FDI-led development [33], and tax revenue and FDI often act as complementary forces in supporting GDP [34].

However, despite strong evidence that both tax revenue and FDI influence GDP, most previous studies have not examined them together within a single, integrated framework especially using long-term data across Southeast Asian countries. While each variable has been studied on its own, there is limited research assessing their simultaneous or independent effects on GDP growth in the region. This leaves a significant gap in understanding how fiscal policy and foreign capital jointly influence economic performance.

Previous studies often examined only one factor or focused on small country samples. For example, one study explored the FDI–GDP relationship in select Southeast Asian countries [1]. Another investigated tax and FDI roles without integrating their interaction [35], and a third linked tax revenue to GDP per capita without considering foreign investment [36]. Some research focused on structural disparities [37], while others examined disruptions from global shocks [38].

This study addresses the research gap by examining how tax revenue and FDI influence GDP across the Southeast Asian countries from 2009 to 2023. Grounded in Public Policy Theory and using panel data analysis, it explores how fiscal capacity and foreign capital influence national output, aiming to inform evidence-based policymaking and long-term economic strategy within Southeast Asia countries.

More specifically, this research seeks to: 1. Investigate the beneficial role that tax revenue plays in GDP levels among Southeast Asian countries from 2009 to 2023, by testing if increases in tax revenue are associated with higher GDP. 2. Determine how inflows of Foreign Direct Investment add to GDP across Southeast Asia, evaluating whether greater FDI is associated with higher GDP. 3. Confirm that both tax revenue and FDI individually contribute positively to GDP, based on panel data regression results over the 15-year period.

This study investigates how tax revenue together with foreign direct investment (FDI) influence the GDP of Southeast Asian economies between 2009 and 2023, making use of panel data techniques. Grounded in relevant theoretical perspectives and prior empirical findings, the study formulates the following hypotheses to be tested:

H1: Tax revenue has a meaningful positive impact on the GDP of Southeast Asian countries.

H2: Foreign direct investment (FDI) has a meaningful positive impact on the GDP of Southeast Asian countries.

By testing these hypotheses, the research aims to contribute empirical evidence to policy discussions on fiscal reform and investment strategy, supporting Southeast Asian governments in designing balanced approaches to long-term economic growth.

2. Method

Research Design

This research adopts a quantitative approach to analyse how tax revenue and FDI influence on GDP in selected Southeast Asian countries from 2009 to 2023. By applying panel data analysis, the research captures both country and time variations, improving the strength and consistency of the outcomes. The examination of data was conducted with Stata 17, a statistical package appropriate for macroeconomic and policy-oriented studies.

Population and Sampling

The target population consists of nations within the Southeast Asia region. A purposive sampling approach was used to select countries that maintain consistent and complete annual data on GDP, tax revenue, and FDI over the 15-year period. The final sample comprises 11 nations: Republic of Indonesia, Malaysia, Vietnam, Thailand, the Republic of Philippines, the Republic of Singapore, the Kingdom of Cambodia, the Lao PDR, the Republic of the Union of Myanmar, Brunei Darussalam and Republic and Democratic of Timor-Leste. These countries were selected for their diverse economic structures, providing meaningful insights into fiscal and investment trends in the region.

To ensure relevant insights, this research uses purposive sampling, a non-random method where samples are deliberately chosen according to defined criteria aligned with the study's aims.

From the defined population, a group of countries was chosen according to two key conditions: (a) the availability of consistent and reliable data, and (b) the country's economic relevance within the Southeast Asian region. The selected sample includes all southeast Asian countries where sufficient time-series data are accessible.

This approach resulted in a data set covers 11 countries over 15 years (2009-2023), producing a total of 165 observations (11 countries x 15 years = 165 data points). Each observation corresponds to one country-year combination, containing annual values for GDP, tax revenue, and FDI in billions of U.S. dollars.

Data Collection

This study makes use of previously compiled datasets obtained from globally recognised institutions, including the World Bank, IMF e-library, YCharts, and CEIC data.

The variables GDP, tax revenue, and FDI are all reported in billion USD and measured annually from 2009 to 2023 for each country in the sample.

GDP (in billion USD) serves as the dependent variable, while tax revenue and FDI (both in billion USD) are used as independent variables. This research adopts a numerical method and draws on secondary panel datasets covering the years 2009 to 2023 for selected Southeast Asian countries. The analysis is conducted using Stata 17. The following steps outline the analytical process:

Descriptive Statistics

Descriptive analysis was carried out to outline the main features of the datasets. This includes calculating the mean, minimum, maximum, and standard deviation for each variable, namely tax revenue, FDI, and GDP. These figures give an initial overview of the data's distribution and variation.

Correlation Analysis

To analyse the degree and nature of the association between the variables, the Pearson correlation was applied tax revenue, FDI and GDP. This step helps determine whether the independent variables show direct or inverse relationship with the dependent variables.

in the same or opposite direction as the dependent variables. Examining correlations is an initial stage that precedes regression analysis.

Panel Data Regression Analysis

The dataset combines information across countries and years, and its evaluation was utilized panel data egression, which forms as the core of the analysis. This allows the study to control for time series and cross-sectional variations. The general equation is:

$$\text{GDP}_{it} = \alpha + \beta_1 \text{TaxRevenue}_{it} + \beta_2 \text{FDI}_{it} + \mu_{it}$$

Where: GDP_{it} = Represent gross domestic product, measured in billions of US dollars, of country i in year t (dependent variable).

TaxRevenue_{it} = Tax revenue measured in billions of US dollars, of country i in year t

Where: FDI_{it} = Foreign direct investment inflows measured in billions of US dollars, of country i in year t ; β_1, β_2 = Coefficients of the independent variables; μ_{it} = Error term capturing unobserved influences.

The following regression approaches within a panel framework were applied:

Common Effect Model (CEM): this approach considers one overall intercept and slope that remain constant for every country and time period. It ignores unobserved heterogeneity across cross-sectional units and over time.

$$\text{CEM: } \text{GDP}_{it} = \alpha + \beta_1 \text{TaxRevenue}_{it} + \beta_2 \text{FDI}_{it} + \mu_{it}$$

Where: Assumes a single intercept and slope for all countries and time periods. Does not take into account differences related to specific countries or time periods.

Fixed Effects Model (FEM): addresses country-level factors that remain unchanged over time (such as geography, legal systems, or long-term policies) by allowing each country to have its own intercept. This helps control for omitted variable bias related to time-invariant factors.

$$\text{FEM: } \text{GDP}_{it} = \alpha_i + \beta_1 \text{TaxRevenue}_{it} + \beta_2 \text{FDI}_{it} + \mu_{it}$$

Where: Controls for country-specific factors that do not change over time, such as geography or legal systems, by allowing each country its own intercept. α_i is country-specific, time invariant effect. Captures within-country variation over time. Helps reduce omitted variable bias related to fixed country-level factors.

Random Effects Model (REM): This method considers that the variation unique to each country occurs randomly and are unrelated to the explanatory variables. This model is generally more efficient if the assumption is accurate, but it may introduce bias if the unobserved effects are linked to the independent variables.

$$\text{REM: } \text{GDP}_{it} = \alpha + \beta_1 \text{TaxRevenue}_{it} + \beta_2 \text{FDI}_{it} + \text{ui} + \mu_{it}$$

Where: α = Common intercept; ui = Country-specific random error component; μ_{it} = Idiosyncratic error term; Assumes ui is uncorrelated with the regressors (Tax Revenue and FDI).

The Hausman

The Hausman test helps determine between FEM and REM for the dataset. This assessment compares the estimates from the two models to check whether the differences are systematic. If the test indicates a significant difference between the models, suggesting. That the assumptions underlying the random effects model are not satisfied, thereby favouring the fixed effects model. On the other hand, if the difference is not statistically significant, the random effects model can be used for its greater efficiency.

Diagnostic and Robustness Checks

Assessment procedures such as multicollinearity (checked using the Variance Inflation Factor, VIF), served to detect multicollinearity, the Breusch-Pagan method was applied to identify heteroskedasticity, and Durbin-Watson statistic was used in assessing autocorrelation. These procedures are carried out to confirm the accuracy and consistency of the regression models. If any issues are detected, robust standard errors or alternative model specifications are applied.

Hypothesis Testing via Panel Data Regression

This research adopts a hypothesis-driven analytical framework to quantify how variations in tax revenue and FDI contribute to GDP performance across Southeast Asian nations over the 2009-2023 period. At the heart of this analysis is a panel data regression model, selected for its capacity to uncover structural patterns across both spatial (country-level) and temporal(yearly) dimensions. This method provides a robust empirical platform for isolating the economic effects of fiscal and investment variables on GDP performance. This research evaluates the hypotheses outlined below:

H1: Tax revenue has a meaningful positive impact on the GDP of Southeast Asian countries.

H2: Foreign direct investment (FDI) has a meaningful positive impact on the GDP of Southeast Asian countries.

Each hypothesis reflects a distinct yet interrelated economic mechanism - fiscal, cash inflow, and their combined structural impact on national output. To test these hypotheses, this research applies both a model that captures constant country-specific traits over time and another that treats these traits as random and uncorrelated with predictors. The choice between these modelling approaches is informed by the Hausman test, which assesses whether it is more appropriate to treat country-level differences as fixed characteristics or as random variations.

Once the appropriate model is identified, estimation proceeds by evaluating the statistical significance of each independent variable (tax revenue and FDI) in explaining GDP. The findings indicate that both variables exhibit positive and meaningful coefficients, thereby supporting the acceptance of both hypotheses. In addition, the joint inclusion of tax revenue and FDI in the model

significantly improves its explanatory power, affirming their complementary roles in driving economic development. The significance of each independent variable is tested using t-tests, while the F-test evaluates the overall model fit. The R^2 statistic measures how much variation in GDP can be explained by tax revenue and FDI. Hypotheses are accepted if a P-value under 0.05 serves as the criterion for hypothesis acceptance.

3. Results and Discussion

This part explains the findings derived from the panel data analysis conducted to assess how tax revenue and FDI affect GDP of Southeast Asian countries over the period 2009–2023. The sequence of analysis was organized to ensure clarity: data preparation came first, followed by descriptive statistics for initial insights. Diagnostic tests were then performed to verify classical assumptions. The normality of data was assessed using the Kolmogorov-Smirnov test. An assessment of multicollinearity was performed through the Variance Inflation Factor (VIF), while the Glejser test was used to evaluate heteroscedasticity.

After completing the diagnostic tests, three panel data estimation approaches were utilized: CEM, FEM, and REM. To select the most consistent specification, the Chow procedure was applied to evaluate FEM against REM. According to the results, the chosen model is then re-estimated using heteroscedasticity consistent standard errors to address the presence of variance irregularities detected earlier. The empirical results are interpreted in line with the study's objectives and hypotheses, offering insights into the fiscal and investment dynamics shaping economic growth in the region.

Descriptive Statistics

Descriptive statistics results showed that the average log of GDP is 5,51, while tax revenue and FDI have means of 3,34 and 2,99, respectively. FDI has the highest deviation standard (1,09), indicating considerable variation among observations.

Multicollinearity Test

The VIF scores calculated for each independent variable were found to be under 10, which shows there is no multicollinearity and that the predictors are independently contributing to the model.

Heteroscedasticity Test

Results showed no significant relationships between the absolute residuals and the independent variables ($p > 0,05$), indicating constant error variance across observations.

Panel Data Approaches

Common Effect Model (CEM): The result shows that both tax revenue and FDI have positive coefficients, neither variable is linked to an overall rise in GDP. The standard errors are relatively small, suggesting precise estimates. Both variables are statistically significant, with t-values above 2 and p-values below 0,05. An F-statistic of 29,34 ($P = 0,000$) confirms that the model as a whole is statistically valid. With $R^2 = 0,4513$, it can be interpreted that tax revenue and FDI together account for about 45,13% of the variation observed in GDP.

Fixed Effect Model (FEM): In the FEM, the coefficients for tax revenue and FDI remain positive, consistent with both theoretical expectations and previous results. The standard errors are still low, reflecting reliable estimates even after controlling for country-specific effects. The t-values for both variables exceed 3,9; with p-values of 0,000, confirming strong statistical significance. The model's F-statistic is 10,44 ($p = 0,000$), indicating overall significance. The within R-squared is 0,5757, meaning 57,57% in temporal differences observed within countries is explained by an independent variables.

Random Effect Model (REM): Under the REM, both tax revenue and FDI continue to show a positive relationship with GDP. The analysis uses z-values instead of t-values due to the model's random-effects assumptions, and both variables are highly significant ($z > 47$, $p = 0,000$). The Wald chi-square test yields a value of 135,95 ($p = 0,000$), confirming that the model is statistically valid.

An overall $R^2 = 0,5376$ indicating tax revenue and FDI together explain 53,76% of the differences in GDP observed across countries and over time.

Model Selection Tests

Table 1. Model Selection tests result

Component	Result
Chow Test	F = 5,218; P = 0,000 - FEM preferred
Hausman Test	F = 5,218; P = 0,000 - FEM preferred
Final Model	Fixed Effect Model (FEM) with Robust SE
R-squared	0,7587 ($\approx 76\%$ variance in GDP explained)
Tax Revenue Effect	Coefficient = 0,532; P = 0,000 (positive and significant)
FDI Effect	Coefficient = 0,294; P = 0,000 (positive and significant)

Source: Processed by the author using Stata 17, based on secondary data (2009–2023)

The suitability of CEM versus FEM was evaluated using the Chow test. With a P – value less than 0,05, the test result led to the rejection of the null hypothesis, showing that FEM was the preferable choice. This result suggests that there are significant individual differences across the entities in the dataset that need to be captured by the model. The Hausman test was then employed to decide between FEM and REM. With the P-value under 0,05, the null hypothesis was dismissed and results supported FEM as the more suitable model. This indicates that the individual effects are correlated with the independent variables, making FEM the more reliable choice.

Final Model Especification: FEM Estimated Using Robust Standard Errors

Fixed-effects (within) regression		Number of obs	-	156
Group variable: country_id		Number of groups	-	11
R-squared:		Obs per group:		
Within	- 0.5757	min	-	10
Between	- 0.7632	avg	-	14.2
Overall	- 0.7587	max	-	15
corr(u_i, Xb) = 0.1657		F(2,143)	-	96.99
		Prob > F	-	0.0000

gdp_log	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
tax_log	.4128463	.0471704	8.75	0.000	.3196049	.5060878
fdi_log	.0991477	.0285046	3.48	0.001	.0428029	.1554925
_cons	3.069735	.1294486	23.71	0.000	2.813855	3.325615
sigma_u	.9573762					
sigma_e	.18462206					
rho	.96414543	(fraction of variance due to u_i)				

F test that all u_i=0: F(10, 143) = 133.96		Prob > F = 0.0000
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Source: Processed by the author using Stata 17, based on secondary data (2009–2023)

Figure 1. Results of the FEM Estimation Adjusted using Robust Standard Errors

The result confirmed that tax revenue and foreign direct investment contribute meaningfully to GDP. Robust testing FEM model demonstrated an R-squared of 0,7587; explaining approximately 76% of the variance in GDP.

Discussion

Impact of Tax Revenue on GDP

Regression outcomes indicate that tax revenue exerts a meaningful influence on GDP, confirmed at the 5% significance level ($P > 0,005$). This outcome validates the first hypothesis: higher tax revenue leads to higher GDP in Southeast Asia. The positive coefficient shows that effective revenue collection translates to greater national output.

This result aligns with the view that tax revenue funds infrastructure, public services, and social programs—key drivers of GDP development. In Southeast Asia, tax revenue enables governments to fund infrastructure development, public services, and social programs, all of which contribute to GDP generation. Strengthening domestic tax systems is thus essential not only for fiscal health but also for sustaining economic growth. Evidence supporting this is found in studies that link improved tax administration to sustained economic expansion [4], highlight an importance associated with a transparent tax system in driving long-term sustainable development [39]. The regression findings further suggest that FDI contributes positively to GDP, with statistical conformation validated at the 5% threshold ($P < 0,05$).

Impact of FDI on GDP

The regression results also indicate that FDI exerts a substantial contribution to GDP, with the effect confirmed by a P-value below 0,05. This finding confirms the second hypothesis: that higher levels of foreign direct investment with GDP in Southeast Asian countries. The positive coefficient suggests that foreign capital inflows contribute directly to increases in national output. FDI supports GDP by enhancing productive capacity, transferring technology, creating employment, and improving infrastructure. In the Southeast Asian context, consistent FDI inflows have been linked with higher levels of industrial activity, trade expansion, and integration into global value chains—factors that contribute to output growth. This aligns with the conclusions of researchers who highlight institutional quality and openness as essential conditions for maximizing the benefits of FDI [40], [41].

Institutional Influence and Interpretation

Although the regression reflects regional averages, results likely vary by country depending on institutional strength. Nations with stronger governance may experience greater benefits from tax revenue and FDI, while weaker institutions could limit these effects. Due to data gaps, these factors could not be included in the analysis, but future studies could use measures like the Worldwide Governance Indicators to enhance the analysis.

Study Limitations

This research has a few key limitations. Governance quality and tax system efficiency were not included, although they may influence outcomes. Potential endogeneity with FDI, as higher GDP can also attract more investment. Some countries and years had incomplete data, which may affect robustness. Future studies could address these gaps by using instrumental variables, dynamic panel models, and broader institutional indicators.

4. Conclusion

This research analysed how tax revenue and FDI affect the GDP of Southeast Asia nations over the period 2009-2023, applying a panel data regression approach. Among the models tested, FEM emerged as the best fitting option, as confirmed by both the Chow and Hausman tests. FEM was identified as the most appropriate, as it effectively controls for time-invariant, country-specific characteristics.

Findings confirm that both tax revenue and FDI significantly contribute to GDP. Tax revenues provide financial capacity to governments to support infrastructure development, and the delivery of public facilities, while FDI supports growth through capital inflows, technology transfer, and integration into global markets.

While the findings reveal significant relationships, they must be understood within the context of the study's limitations, which were discussed earlier. In particular, the absence of institutional indicators and the potential for endogeneity, especially in FDI, may have influenced the results. Future research could enhance the model's explanatory power by integrating governance measures and employing more dynamic methodologies.

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Analysis of capital market reaction to the 2024 Prabowo-Gibran inauguration on Indonesian Stock Exchange

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ABSTRACT

The Free Nutritious Meals (MBG) program was one of Prabowo-Gibran's flagship programs during the 2024 presidential and vice-presidential election campaign. The inauguration of the Prabowo-Gibran president and vice-president was a highly anticipated event not only by the public, but also by investors who believed it would impact the Indonesian capital market. This study aimed to examine the market reaction to the inauguration of the Prabowo-Gibran president and vice-president among companies in the consumer non-cyclical food and beverage subsector on the IDX. The capital market reaction was proxied by trading volume activity and abnormal returns. The researchers used a population of companies in the consumer non-cyclical food and beverage subsector and obtained a sample of 91 companies using a purposive sampling method. The observation period for the reaction was three days before and three days after the event from 16 October 2024 until 23 October 2024. Testing was conducted using the One Sample Kolmogorov-Smirnov test for normality and the Wilcoxon Signed Rank Test for hypothesis testing using SPSS 26. The study found that there is no difference in average trading volume activity before and after the event. This was due to investors adopting a wait-and-see strategy due to economic instability amidst changes in the country's political situation. However, there was a difference in abnormal returns before and after the event. This aligns with signaling theory, which states that every signal from an event will be perceived by investors as useful information for making investment decisions.

Keywords: Event Study, Capital Market Reaction, Prabowo-Gibran Inauguration, Indonesian Stock Exchange

1. Introduction

Capital markets have a complex role in the dynamics of a country's economic growth. Capital market fluctuations are influenced by responses to information, that came from events [1]. Capital markets are influenced by various events surrounding them, both economic and non-economic events. One form of non-economic event that is considered capable of influencing capital markets is political events [2].

The inauguration of the President and Vice President is one of the political events that is considered to have an influence on the capital market [3]. According to KPU regulation No. 360 on 2024, President and Vice President Prabowo-Gibran won the presidential election and will be inaugurated as President and Vice President of the Republic of Indonesia on October 20, 2024 [4]. This event occurs only once in a few periods and brings about major changes to the state system and also to the economy, so it is considered capable of influencing the capital market.

Signaling Theory

As for the relationship between an event and the capital market, this aligns with the concept of signaling theory. Signaling theory is a theory that states that every event will contain a specific set of information that influences the capital market [5]. The information contained in the presidential inauguration is considered to be able to influence trading on the capital market [6].

Efficient Market Hypothesis (EMH)

The capital market will always reflect market conditions, this is in accordance with the economic theory of the efficient market hypothesis (EMH) [7]. The efficient market hypothesis (EMH) explains that asset prices (stock prices) will always reflect the response to all information available in the capital market [8]. The capital market in Indonesia often reflects investor responses to events that occur, thus aligning with the efficient market hypothesis (EMH) theory in analyzing capital market reactions to the inauguration of the president and vice president in 2024 [9].

Event Study

Event study is a method used to observe market reactions to events through the analysis of publicly disclosed events. Event study uses a specific research period to examine the information content of the events being studied. Event study use timeframe to prevent biased market reaction patterns to other events. The application of event study to information content analysis in the capital market can be studied by use trading volume activity and abnormal returns [10]. One of the factors determining information content is fluctuations in the capital market [11].

Differences in Trading Volume Activity Before and After the Prabowo-Gibran Inauguration

Trading volume activity is a measure that focuses on the quantity of trading. Trading volume activity reflects investor reactions through changes in transaction volume. This variable provides insight into changes caused by an event and provides a concrete view of market liquidity [12]. Therefore, the inauguration of the president and vice president is considered capable of generating changes in trading volume activity before and after the event. **H1:** There is a difference in trading volume activity before and after the inauguration of President and Vice President Prabowo-Gibran in 2024 in the food and beverage subsector on the IDX.

Differences in Trading Volume Activity Before and After the Prabowo-Gibran Inauguration

The reaction to response some information from event can also be measured through the abnormal return variable [3]. Abnormal returns are defined as the difference between actual returns and expected returns, indicating a deviation from the normal rate of return. Abnormal returns can be a powerful indicator in examining market reactions, because if there are abnormal returns around an event window, this indicates that the market is reacting to the information. [13]. The inauguration of the president and vice president, a non-economic event, is considered to be one of the events capable of generating abnormal returns in the capital market. **H2:** There is a difference in abnormal returns before and after the inauguration of the president and vice president Prabowo-Gibran in 2024 in the food and beverage subsector on the IDX.

One of the flagship programs of President and Vice President Prabowo-Gibran during the campaign period was the Free Nutritious Meals Program (MBG). The program targets elementary, junior high, and high school students in Indonesia. This program is predicted to require a large supply of food and beverages, so it is expected to have a certain reaction on the IDX companies in the food and beverage subsector [14]. This study aims to examine the market reaction to the inauguration of President and Vice President Prabowo-Gibran in 2024 on the Indonesia Stock Exchange in the food and beverage subsector, for three days before to three days after the event from October 16, 2024 to October 23, 2024. Market reaction is proxied by the variables trading volume activity and abnormal return.

2. Method

Research Design

This research is based on a comparative quantitative research method. It employed an event study approach. The observation period was seven days: three days before and three days after the event. The inauguration of President and Vice President Prabowo-Gibran is scheduled for October 20, 2024. However, because that date was a holiday, the date was moved to October 21, 2024. The measurement dates for the trading volume activity and abnormal return variables were from October 16, 2024, to October 24, 2024, during the seven-day market opening.

Data Collection Instruments

The data collection method in this study is by using documentation through recording, reviewing and analyzing data published by sample companies through access to the official website of the Indonesian Stock Exchange with adjustments to the researcher's data needs.

Sample

The population and sample of this study were all 101 companies registered in the food and beverage subsector. Based on Table 1, from the total population of registered companies, 91 samples were obtained, with the following selection criteria:

Table 1. Determination of Research Samples

No	Criteria	Amount
1.	The company is listed in the food and beverage subsector on the Indonesia Stock Exchange	101
3	Food and beverage sub-sector companies that do not publish daily closing price data	(7)
4	Food and beverage sub-sector companies that carry out corporate actions	(3)
Total		91

Source: www.idx.co.id, data processed by researchers, 2024

Data analysis

In this study, data description was examined using descriptive statistical models using the IBM SPSS 26 application. Data normality testing used the One-Sample Kolmogorov Smirnov Test, and in testing the hypothesis, using the non-parametric Wilcoxon signed ranked test.

3. Results and Discussion

Descriptive Statistics

Based on the data in Table 2, of the 91 samples tested, the minimum value before the event was 0,000088, and after the event was 0,000442. The maximum value before the event was 28,885311, with the maximum value after the event being 10,62750. The average trading volume activity before the inauguration of President and Vice President Prabowo-Gibran in 2024 was 1,1305509, with the average trading volume activity after the inauguration of President and Vice President Prabowo-Gibran in 2024 being 0,0668183.

Table 2. Descriptical Test Variabel Trading Volume Activity

No	Desc.	N	Minimum	Maximum	Mean	Std.Dev
1	ATVA Before	91	0,000088	28,885311	1,1305509	3,5395631
2	ATVA After	91	0,000442	10,627500	0,0668183	1,4630234

Source: data processed by researchers, 2025

Table 3 presents the results of the descriptive statistical test of abnormal returns, where the minimum abnormal return before the event was -0,155840 and after the event was -0,056870. The maximum value before the event was 0,027498, with the maximum value after the event being 0,141290. The average abnormal return before the inauguration of President and Vice President Prabowo-Gibran in 2024 was -0,002583, with the average abnormal return after the inauguration of President and Vice President Prabowo-Gibran in 2024 being 0,005269.

Table 3. Descriptical Test Variabel Trading Volume Activity

No	Desc.	N	Minimum	Maximum	Mean	Std.Dev
1	AAR Before	91	-0,155840	0,027498	-0,002583	0,019597
2	AAR After	91	-0,056870	0,141290	0,005269	0,021272

Source: data processed by researchers, 2025

Normality Test

The normality test in this study uses the One Sample Kolmogorov Smirnov Test with the condition that if the Asymp. Sig. (2-tailed) value is more than 0,05 then the data is said to be normally distributed. If the Asymp. Sig. (2-tailed) value is less than 0,05 then the data is said to be not normally distributed. If the data is normally distributed, hypothesis testing will be continued with the parametric Paired Sample T-Test, whereas if the data is not normally distributed, hypothesis testing will be continued with the non-parametric Wilcoxon Signed Ranked Test.

Table 4. Descriptical Test Variabel Trading Volume Activity

	ATVA Before	ATVA After	AAR Before	AAR After
N	91	91	91	91

<i>Normal Parameter</i>	<i>Mean</i>	1,130550	0,669538	-0,002583	0,005269
	<i>Std. Dev</i>	3,539563	1,462449	0,019597	0,021272
<i>Most Extreme Differences</i>	<i>Absolute</i>	0,375	0,324	0,265	0,168
	<i>Positive</i>	0,354	0,295	0,160	0,168
	<i>Negative</i>	-0,375	-0,324	-0,265	-0,145
<i>Test Statistic</i>		0,375	0,324	0,265	0,168
<i>Asymp. Sig. (2-tailed)</i>		0,000 ^c	0,000 ^c	0,000 ^c	0,000 ^c

Source: data processed by researchers, 2025

Table 4 shows the significance of the average trading volume activity value before and after the presidential and vice-presidential inauguration event at 0,000. The presented value is less than $> 0,05$, or classified as ATVA data before and after the event is not normally distributed. A similar thing occurs with the average abnormal return variable before and after the event, where the Asymp. Sig. (2-tailed) value before and after the event is 0,000, so it is less than 0,05, or in other words, not normally distributed. Based on the classification of the normality test that occurred, the testing step is continued with the non-parametric Wilcoxon Signed Rank Test.

Hypothesis Test

The results of the normality test for the trading volume activity variable were 0,000 or below 0,05, so the hypothesis test was continued with the non-parametric Wilcoxon signed-rank test. Table 5, show a significance value from asymp.sig (2-tailed) conclude value 0,555 was obtained. This value indicates that the hypothesis H_0 is supported, thats concluding there is no significant difference in trading volume activity before and after the inauguration of President and Vice President Prabowo Gibran in 2024.

Table 5. Wilcoxon Signed Ranked Test from Trading Volume Activity

	ATVA Before-ATVA After
<i>Z</i>	-0,590 ^c
Asymp. Sig. (2-tailed)	0,555

Source: data processed by researchers, 2025

The results of the normality test for abnormal return variable were 0,000 or below 0,05, so the hypothesis test was continued with the non-parametric Wilcoxon signed-rank test. Table 6 presents the results of the hypothesis test on the abnormal return variable which obtained an Asymp. Sig. (2-tailed) value is 0,001. The value presented is smaller than 0,05 so that H_0 is rejected or can be interpreted that there is a difference in abnormal returns before and after the inauguration of President and Vice President Prabowo Gibran in 2024 in non-cyclical consumer sector companies in the food and beverage subsector listed on the IDX.

Table 6. Wilcoxon Signed Ranked Test from Abnormal Return

	AAR Before-AAR After
<i>Z</i>	-3,253 ^c
<i>Asymp Sig (2-tailed)</i>	0,001

Source: data processed by researchers, 2025

Discussion

Differences in Trading Volume Activity Before and After the Inauguration of President and Vice President Prabowo-Gibran in 2024

The findings from the hypothesis test on the trading volume activity variable indicate no significant difference between the periods before and after the inauguration of President and Vice President Prabowo-Gibran in 2024 for companies in the non-cyclical consumer sector, the food and beverage subsector, listed on the Indonesia Stock Exchange. The study found that the null hypothesis H0 was supported, indicating no statistically significant difference in trading volume activity due to the event.

Based on the study, there was a significant decrease before and after the event. This decrease indicates that the market responded negatively to the event. The decrease in trading volume activity that occurred during the inauguration of President and Vice President Prabowo-Gibran was caused by investors reducing trading activity through a wait-and-see strategy. Investors had low confidence in the sample issuers, resulting in a decrease in trading volume activity. Economic instability due to the change in leadership was the main driver of the change in trading volume activity.

The findings of this test align with signaling theory, which explains how investors respond to information in interpreting events. Investors who make decisions Investing is based on each individual's level of understanding and ability to interpret the meaning of an event. The lack of significant differences in average trading volume activity reflects variations in investor perceptions and reactions to the information content of the inauguration, the event studied. Investors tended to hold some unnecessary transactions, considering the level of risk associated with the country's economic instability during the inauguration of President and Vice President Prabowo-Gibran. This study yields similar conclusions to Karina's study, "Analisis Reaksi Investor di Bursa Efek Indonesia pada Pelantikan Joko Widodo" The results indicate that Jokowi's inauguration event did not significantly impact the timing of the event [3].

Difference in Abnormal Returns Before and After the Inauguration of President and Vice President Prabowo-Gibran in 2024

The results of the hypothesis test on the abnormal return variable indicate a significant difference between the periods before and after the inauguration of President and Vice President Prabowo-Gibran in 2024. Based on this study, the results of the null hypothesis H0 were rejected, which showed a significant difference in abnormal returns before and after the inauguration. This significant difference in the average abnormal returns was caused by strong investor interest in the event. Although the presidential and vice-presidential inauguration caused economic instability, investors viewed the free nutritious meal program (MBG) of President and Vice President Prabowo-Gibran as an investment opportunity in food and beverage companies. This finding is also consistent with the Efficient Market Hypothesis (EMH), which states that in an efficient market, all publicly available information is immediately reflected in financial assets, including stock price fluctuations in response to specific events. This research supports Paramarta's study, "Perbedaan Reaksi Pasar terhadap Pelantikan Presiden dan Wakil Presiden Negara Indonesia Tahun 2019" The researchers stated

that there were differences in abnormal returns before and after the presidential and vice-presidential inaugurations [15].

4. Conclusion

Based on the theoretical foundation and empirical findings outlined previously, the following conclusions can be drawn: There was no difference in trading volume activity before and after the inauguration of President and Vice President Prabowo-Gibran in 2024 for non-cyclical consumer companies in the food and beverage subsector listed on the Indonesia Stock Exchange. The decrease was caused by investors reducing trading activity through a wait-and-see strategy. Economic instability due to changes in leadership was a key factor in the change in trading volume activity, particularly after the inauguration. This finding supports signaling theory, which argues that investor responses to an event can vary depending on their ability to interpret the information contained within the event.

There was a difference in abnormal returns before and after the inauguration of President Prabowo and Vice President Gibran in 2024 for non-cyclical consumer companies in the food and beverage subsector listed on the Indonesia Stock Exchange, with a significant increase. This significant difference in average abnormal returns was due to strong investor interest in the event. This finding aligns with the positive average abnormal return. Investors view the presidential and vice presidential inauguration as a series of signals with the potential to generate returns. Although the inauguration of the president and vice president has the potential to create short-term economic uncertainty, investors view the free nutritious meal program as a potential investment opportunity.

Limitations in this study include the varying distribution of trading volume activity values, and varying abnormal returns. The study population focused on non-cyclical consumer companies in the food and beverage subsector listed on the Indonesia Stock Exchange. The event window in this study was 7 days: $t-3$, $t-0$, and $t+3$. Testing market reactions during the presidential and vice-presidential inauguration period is not limited to trading volume activity and abnormal returns. Further research is expected to expand the use of other variables in analyzing the events. A decrease in trading volume activity and an increase in abnormal returns are factors contributing to changes in market reactions. Other factors such as economic uncertainty, national stability, and investor perceptions should also be considered in future research. Future research could also consider using other sectors on the IDX to assess the impact of the events studied.

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Indonesia's SSB tax policy plan: a review

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ABSTRACT

The purpose of this study is to find out whether the extensification of the excise object of Packaged Sweetened Beverages (SSBS) can have the opportunity to reduce the number of people suffering from non-communicable diseases. The research method uses a literature study approach, the data source is secondary data from the collection of SCOPUS-accredited journals, SINTA, books, and related documents. Analysis is used with an exploratory approach. The results of the study revealed that the imposition of excise on SSBS can reduce purchase interest in products with high sugar content due to an increase in product prices, the imposition of excise also has a great opportunity for educational moments and increasing awareness in the community of the importance of a healthy lifestyle.

Keywords: Sugar-Sweetened Beverages, Tax, Policy

1. Introduction

The high consumption rate of sweetened beverages in Indonesia from 2010 to 2014 reached 85.6% and is always increasing every year, Indonesia is the country with the 6th highest global sugar consumption in the world reaching 7.8 million metric tons in 2023 in line with the increasing demand from the Food & Beverages (FnB) industry and the increase in population and lifestyle [1]. Low prices, aggressive marketing, diverse product variants, and ease of accessibility in SSBS products are the triggers for a sharp increase in SSBS consumption, these conveniences make it easy for people to buy and consume, especially the children and adolescents market segment who can consume freely without parental control [2].

Long-term consumption of sweetened beverages can be the cause of Non-Communicable Diseases (NCDs) for the community. Meanwhile, NCDs such as cardiovascular diseases, strokes, diabetes mellitus, and others are the cause of very high mortality because they are related to human lifestyle and nutritional intake [3]. Consumption of sugar more than 50 g (4 tablespoons), sodium more than 2000 mg, and total fat/oil net 67 g per person per liver will increase the risk of diabetes, stroke, hypertension, and heart attack which are the highest causes of death [4].

In the last 30 years, the trend of causes of death has undergone a transition and change from infectious diseases to Non-Communicable Diseases (NCDs) which are the cause of death in approximately 41 million people every year and this figure is equivalent to 74% of all total causes of human death in the world. 86% of premature deaths and approximately 17 million deaths occur in low- and middle-income countries with cardiovascular disease being the highest cause of death (\pm 17.9 million), cancer (9.3 million), chronic respiratory (\pm 4.1 million) and diabetes (2 million deaths, including chronic kidney disease due to diabetes) each year [5]. [6] reported that there was a change in Disability Adjusted Life Years (DALYs) Lost in Indonesia, including diabetes mellitus (1.8%; 961 per 1000 population), and more than half of DALYs lost in Indonesia due to NCDs (69%)

Research related to SSBS or the keyword "sugar sweetened beverages", tax is the word most often used by researchers [7]. Pricing instruments have an effect on people's lifestyles so that they need to be carefully considered and evaluated to overcome health risks that arise in the community [8]. Intervention in the price of consumer goods through tax instruments is important, because specifically lifestyle, consumption habits of sugary drinks/meals, and nutritional status affect the status of blood glucose (related to diabetes NCDs) in both urban and rural communities, and typical of any community [9].

In view of the regularend function and budgetwater (potential excise revenue), SSBS's revenue target is projected to reach Rp. 3.08 trillion which has been contained in the Fiscal Policy on Macroeconomics and Fiscal Policy Principles (KEM-PPKF) 2024 [10]. There is high potential for excise revenue from liquid energy drinks of IDR 554.5 billion and IDR 14.25 trillion from one of the concentrated energy drink brands if it becomes an extension of BKC [11]. The determination of excise duty on carbonated beverages has the potential to increase excise revenues on Beverages Containing Ethyl Alcohol (MMEA) [12]. The Government of Indonesia through the Directorate General of Customs (DJBC) as a revenue collector plays a role in achieving revenue targets every year, apart from optimizing the joint program of synergy of central and vertical state revenues, the extension of SSBS is also a strategic initiative to increase state revenue and economic support [13].

Excise is an indirect tax, so it is not like the perspective of direct taxes (Building Land Tax, Motor Vehicle Tax, Income Tax). Excise is a levy imposed on certain goods that must be emphasized for the sake of legal certainty and adjusted to the capabilities and aspirations of the community [14]. The differentiator of excise and other taxes, namely selectivity on coverage (not all goods circulating in the market can be subject to excise) [15]. Excise, as a mechanism of extensification, qualifies as a sin tax applied to Excisable Goods (BKC), whose consumption may negatively impact both individuals and the wider community [16], [17]. As well as the Chinese government imposing a 5% tax on single-use wooden chopsticks in response to the

high production of 45 billion pcs of single-use wooden chopsticks every year and the imposition of taxes to reduce deforestation activities and the amount of single-use waste [18]. Similarly, SSBS is subject to excise to reduce consumption of SSBS products so that people who choose not to consume these products will not be subject to any excise because only SSBS products are subject to excise.

Therefore, the research questions in this study can be formulated as follows:

RQ1: How has the literature on the imposition of Sugar-Sweetened Beverages (SSBs) taxes developed in countries that have already implemented such taxes, and what impact has it had on sugar consumption patterns?

RQ2: How can the imposition of SSBS taxes alter public consumption patterns of sugar?

RQ3: What are the directions for future research?

The structure of this study includes a methods section that will explain the technical analysis techniques, data sources, and the steps involved in analyzing the literature. The results section is further divided into four subsections, which include: a description of the articles, an analysis of how the SSBS tax scheme impacts the prevalence of Non-Communicable Diseases (NCDs), and how it influences consumer behavior and purchasing decisions through a benefit analysis. Finally, a summary will be provided discussing the development of future research, limitations, and implications of the study.

2. Method

This study employs a qualitative approach using the library research method. Qualitative research is used to understand social phenomena from the participants' perspectives. Therefore, the meaning or purpose of qualitative research is to study natural conditions of the objects, with the researcher serving as the key instrument [19]. The library research method refers to previous studies on topics related to the analysis of SSBS tax, its impact on the prevalence of NCDs, and its influence on consumer purchasing decisions [20]. Library research is related to theoretical studies through references that address values, culture, and norms that evolve in the social situation under investigation. Moreover, library research was chosen because the researcher considers that library data remains reliable in addressing the research problem.

This library research was conducted by collecting various relevant references related to the research problem, followed by a thorough understanding to derive research findings. The articles analyzed were obtained from internationally and nationally indexed journals. The articles are related to SSBS taxation and its intricacies, which were sourced through the Google Scholar database by searching for keywords such as "*kebijakan cukai MBDK*" or "Sugar-Sweetened Beverages tax" or "*kebijakan cukai Minuman Berpemanis Dalam Kemasan*". This study used Google Scholar as the primary database because it gathers all scientific articles available on the internet. Subsequently, the researcher verified the accreditation status of the journals, and articles published in non-accredited journals were eliminated from the sources analyzed. After all the data was collected through a series of selections, the next step was data analysis, which involved systematically and thoroughly reviewing and comparing the data found. In this study, content analysis techniques were used.

3. Results and Discussion

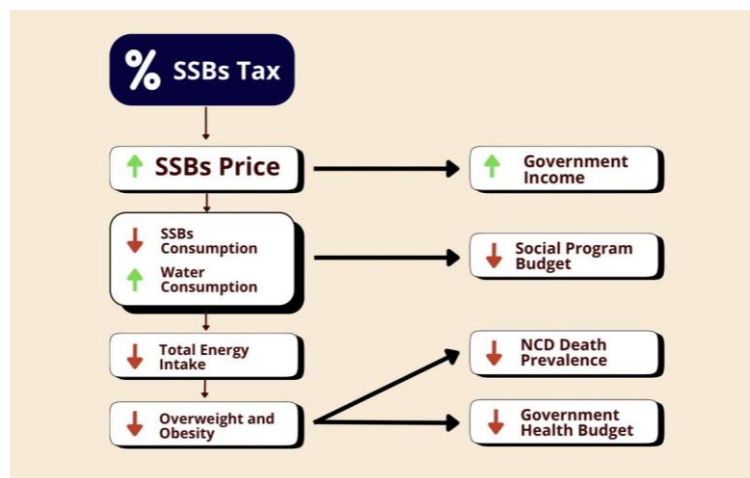
Study Says: How do SSBS tax affect human behaviour?

The United States and Malaysia impose duties on sugar which means that goods that are considered to have a negative impact on health, both sugar consumed directly and food and beverage products that have been processed in factories. India, Germany, Japan, Singapore, France, also impose taxes on products and other relevant things that contain sugar to optimize control on sugar consumption and Indonesia has imposed taxes on ethyl alcohol products and beverages that contain ethyl alcohol [21]. SSBS is considered to be in accordance with the criteria for excisable goods, with the aim of encouraging industry players to sweeten packaged

products to reformulate product content to be healthier. The design of goods that will be subject to excise is the manufactured beverage industry [22].

The French state has implemented a soft drink tax of 0.220 euros per liter of beverages containing more than 0.5% sugar since 2012 which shows a very small downward trend due to low tariffs on the purchase of sweetened beverages 0.5 liters per capita per year [23]. In some cities in the US, taxes on SSBs that affected the increase in the price of sweetened soda, coffee, tea, fruit-flavored drinks and energy drinks cut sales by 33% in response to price increases that then changed consumer consumption patterns and found that for every 1% increase in prices there was a 1% decrease in purchases of each product [24]. The imposition of a 10% tax on SSBs has been proven to cause an 8-10% decrease in purchases and consumption in the market [25], [26]. The imposition of SSBs has also shown positive effects in various countries on declining sales, imports and consumption, including: the United States, malaysia [27][31]. Various public policy mechanisms implemented to reduce the risk of type 2 diabetes in various countries around the world, including the control of the obesity epidemic, the excise levy on SSBS is considered very promising to reduce consumption and ease the burden of type 2 diabetes, causing price increases, then reducing consumption, with a more targeted impact among lower socioeconomic groups [32].

The SSBs excise scheme leads to an increase in prices and a decrease in consumption, with the potential for a large impact on the low socioeconomic group. It has been proven to improve consumption patterns and prevent type 2 diabetes and cardiometabolic diseases [32], [33]. It is further explained in the following scheme:



Source: [34]

Figure 1. SSBs Benefits Workflow Scheme

The scheme above illustrates how the imposition of excise on SSBs can benefit the community in terms of health and economy. The imposition of excise on SSBs increases the selling price of products so that it can reduce the consumption of SSBS and increase the consumption of water, so that it can become a lifestyle for energy intake control to prevent overweight and obesity through controlling excess sugar consumption so that it can reduce the prevalence and death of NCDs and reduce the burden of health costs in the State Budget. From the financial side, the imposition of excise increases government revenue and reduces the cost burden of social programs. It is necessary to conduct an in-depth study related to the impact of imposition at a certain level on inflation and price elasticity so that the imposition of excise can effectively reduce the amount of consumption of sweetened beverages [35].

Jenis Penerimaan	APBN	Perpres 75/2023	Realisasi		Growth (y-o-y, %)		% Capaian	
			2022	2023	2022	2023	APBN	Perpres 75/2023
1 BEA MASUK	47,53	53,09	51,08	50,84	30,56%	-0,47%	106,96%	95,75%
2 CUKAI	245,45	227,21	226,88	221,82	16,04%	-2,23%	90,37%	97,63%
Hasil Tembakau	232,59	218,70	218,62	213,48	15,79%	-2,35%	91,78%	97,61%
Ethil Alkohol	0,14	0,13	0,13	0,13	12,37%	0,39%	93,38%	100,39%
NMEA	8,67	8,38	8,07	8,10	24,16%	0,36%	93,41%	96,56%
Denda Adm. Cukai	-	-	0,04	0,10	-40,58%	142,02%	-	-
Cukai Lainnya	-	-	0,02	0,02	-6,35%	-19,49%	-	-
Plastik & MBDK	4,06	0,00	0,00	0,00	0,00%	0,00%	0,00%	-
3 BEA KELUAR	10,21	19,80	39,82	13,53	15,18%	-66,03%	132,46%	68,31%
TOTAL	303,19	300,11	317,78	286,19	18,04%	-9,94%	94,39%	95,36%
PPN Impor			270,71	255,80	41,37%	-5,51%		
PPn BM Impor			4,89	7,10	45,11%	45,21%		
PPh Pasal 22 Impor			74,20	69,49	83,33%	-6,35%		
Total PDR lainnya			349,79	332,39	48,64%	-4,98%		
TOTAL DJBC + PERPAJAKAN			667,57	618,58	32,31%	-7,34%		

Source: [36]

Figure 2. Realization of Excise Revenue

Excise revenue is the mainstay engine for state customs revenue which reaches Rp 221.83 trillion (90.37% of the 2023 State Budget target), excise revenue has always increased from year to year at least from 2006-2022 and in 2023 the decrease in customs deposits in 2023 is 95.36% of the target of Presidential Regulation (Perpres) Number 75 of 2023 of Rp 300.11 trillion due to the moderation of crude palm oil (CPO) prices and a decrease in the export volume of mineral commodities and excise revenues caused by the shrinkage of Tobacco Products (HT) production. An important point is that excise revenue is encouraged to remain optimal, but cigarette consumption (HT excise) must be controlled because it is in line with the excise function to limit the consumption of certain goods. SSB's excise extensification has the potential to provide significant excise revenue [21].

Increasing Awareness and Culture of Healthy Lifestyle

The perception of consumption of sugar-sweetened beverages (SSBs) highlights their negative impact on public health, including obesity, diabetes, kidney disorders, and cancer, as well as the belief that such consumption should be controlled through self- and family-level restrictions [37]. The interest of the media and the public in the draft policy on the imposition of excise on SSBs can be used as a socialization momentum by the government, academics, to cultivate healthy living habits in daily life as an investment in the human resources sector which is closely related to improving the quality and standard of living of the Indonesian people. Efforts to reduce the prevalence of diabetes mellitus should not rely solely on pharmacological approaches through pharmaceutical counseling. Instead, they must also include education and counseling aimed at motivating the community to adopt healthier eating behaviors and increasing public awareness to regularly and independently monitor blood glucose levels for better disease control [38]. The policy of imposing excise on SSBs can also be integrated and implemented in conjunction with the discourse on Nutri-Grade labeling in Indonesia which had gone viral on social media because the Singapore Government provides a grade for each product sold on the market from good to worst so that people are more aware of the content in a consumer product. This is elaborative and in line with the right of consumers to guarantee the quality and safety of a product and/or service obtained in the market in accordance with the Consumer Protection Law, meaning that the discourse on the imposition of excise on SSBs and the labeling of Nutri-Grade is an effort and a form of government attention to ensure the quality of consumer products for the public in this case is seen as a consumer protected by law [39].

The conclusion in the discourse on the imposition of excise on SSBs is projected to cause a multiflyer effect for the community and the state. Not only does it have the potential to suppress the prevalence of NCDs in Indonesia, in the economic field, the imposition of SSBs excise is a potential for state revenue through excise which can be a new source of income so

that the Indonesian government through the State Budget can add a budget for allocation to national health programs, education equity and other national strategic programs that have a massive impact on the community. As a public policy, the imposition of excise will receive a positive response and criticism from the public, so it is important to build socialization steps, increase public awareness of taxes with various approaches such as creative content, microblogs, and the involvement of the younger generation to be part of the education, media and promotion team related to finance, fiscal policy, and taxation. The educational approach related to the excise on sugary drinks can be carried out with cooperation and collaboration between the House of Representatives of the Republic of Indonesia and the DJBC (as legislators and implementers).

The results of this study conclude that the implementation of SSBs (sugar-sweetened beverages) tax can influence the reduction of sugar consumption, control the prevalence of NCDs (Non-Communicable Diseases), and is consistent with previous research [40]–[44]. Specifically, it may impact the prevalence of obesity [45], improve public welfare [46], [47] and this policy is essential for Indonesia as a low and middle-income country (LMICs) in addressing the double nutritional burden of malnutrition and obesity [48]. Although SSBs taxation policies have shown promising impacts on consumption behavior change and increased health awareness, previous studies indicate that their economic evaluations still face significant challenges. Documented research reveals that most economic evaluations of SSB taxes rely on indirect evidence, with limitations in capturing long-term effects and the distribution of impacts across different social groups. This highlights the need to develop evaluation frameworks that not only assess health outcomes but also consider social equity implications and broader social costs more comprehensively [49].

SSBs Taxation Policy and Relation to Future Tourism Industry in Indonesia

Beyond its fiscal and public health benefits, implementing an excise tax on sugar-sweetened beverages (SSBs) in Indonesia may also yield substantial contributions to the development of tourism practices. By encouraging healthier consumption behaviors, such taxation aligns with global trends in wellness tourism and reinforces the positioning of Indonesian destinations as sustainable and health-oriented. Moreover, the resultant fiscal revenues such as the Rp 3.6 trillion projected annually from a 20% price increase can be reinvested into health and infrastructure programs that enhance tourism capacity [44]. The reduced burden of non-communicable diseases, such as type 2 diabetes, with projected economic savings of up to Rp 40.6 trillion over a decade, further strengthens workforce productivity and service quality in the tourism sector [50]. Therefore, this study not only advances scientific understanding and public health policy but also demonstrates tangible implications for improving tourism practices and competitiveness.

In line with global tourism trends that emphasize sustainable travel experiences, the demand for healthier food constitutes an essential stage for Indonesia, as a developing country, to capitalize on future market opportunities. Given the country's high level of sugar consumption, the implementation of an SSBs tax deserves particular attention as a strategic policy instrument. In this regard, such a measure is consistent with the worldwide demand for healthier and more sustainable food. Furthermore, Indonesia's rich culinary diversity provides significant potential; by embedding local values into sustainable tourism schemes, the nation can simultaneously promote its cultural heritage and highlight healthier traditional practices.

4. Conclusion

This study concludes that the implementation of Sugar-Sweetened Beverages (SSBs) taxes in various countries—such as the United States, France, and Malaysia—has shown a measurable impact in reducing sugar consumption through price increases and reformulated product content (RQ1). Empirical findings from international experiences indicate that SSBs taxation effectively reduces purchasing behavior, particularly among low-income groups, and

contributes to lowering the prevalence of Non-Communicable Diseases (NCDs) including type 2 diabetes and obesity.

In the Indonesian context, the imposition of an SSBs tax is in line with excise principles and serves dual purposes: generating fiscal revenue and promoting healthier consumption behavior. Moreover, this policy can act as a strategic intervention to shift public dietary patterns, especially when integrated with complementary measures such as health education campaigns and Nutri-Grade labeling.

Future research should focus on evaluating the policy's design and implementation frameworks, including legal readiness, conflict of interest analysis, price elasticity impacts, and consumer response. In addition, interdisciplinary approaches involving public health, economics, and behavioral science are essential to provide evidence-based justification and ensure the policy's social acceptance and long-term effectiveness.

Future Research

This study is limited to a literature review aimed at understanding how the implementation of SSBs tax affects the reduction of sugar consumption in the population. Future research is expected to examine other aspects, including diplomatic perspectives, the establishment of adequate legal frameworks, conflict analysis, and other relevant factors. Considerations may include how policy formulation can be carried out thoroughly and how monitoring and evaluation instruments can be continuously implemented. Future studies are also expected to focus on specific issues such as: analysis of conflicts of interest and the influence of the industry, international implications to avoid trade disputes, sanction schemes for non-compliance (drawing from experiences with excise duties on tobacco and alcohol), policy planning to facilitate access to safe and free drinking water, and studies on consumer behavior regarding healthy products. There's a need for evidence-based health studies to demonstrate the health benefits of SSBs tax in order to gain public and political support [51]. A crucial point for future research on the impact of SSBs tax is that tiered taxes may have greater health and economic impacts at the population level compared to ad valorem taxes, which incentivize consumer behavior changes primarily through price increases [52].

Future studies should address the methodological limitations identified in current economic evaluations of SSB taxation. Most existing evaluations rely on indirect evidence and tend to focus primarily on health outcomes and healthcare system costs, with limited attention to long-term impacts, social cost distribution, and equity considerations. By addressing robust evaluation framework that integrate health and non-health outcome; empirical designs as quasi-experimental or longitudinal studies; policy indirect impact; and exploration of cross-sectoral policy integration, Future research can provide more comprehensive and actionable evidence to inform public health policy and fiscal strategies related to SSB taxation.

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