The Influence of Income, Value Added Tax Increase, and Cigarette Excise Tax Increase on Conventional Cigarette Consumption

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A B S T R A C T

This study aims to examine the effect of income, Value Added Tax (VAT) increase, and cigarette excise tax increase on conventional cigarette consumption among individuals aged 20–30 years in Cirebon City. The research employed a descriptive quantitative method using a questionnaire distributed to 100 randomly selected respondents. Data were analyzed using multiple linear regression with the help of SPSS software. The results indicate that income (X_1) and VAT increase (X_2) have a significant effect on cigarette consumption with significance values of 0.004 and 0.006, respectively (<0.05). However, the excise tax increase (X_3) showed no significant effect (sig. 0.230 > 0.05). The coefficient of determination (R^2) is 0.223, indicating that 22.3% of the variation in cigarette consumption can be explained by the three independent variables, while the remaining 77.7% is influenced by other factors not examined in this study.

1. Introduction

Conventional cigarettes continue to dominate tobacco consumption in Indonesia, playing a dual role as both an economic commodity and a socially constructed behavior. Smoking is often perceived as a symbol of masculinity, particularly among men, shaped by cultural narratives, peer influence, and media portrayal (Ramadani & Agustang, 2023). This masculine image reinforces smoking behavior among adolescents and young adults, normalizing it within everyday social interactions.

Indonesia ranks first in Southeast Asia for the number of smokers, with approximately 65 million individuals, many of whom are in the productive age group of 20–30 years (SEATCA, 2021). Although the government has implemented fiscal policies such as increasing excise taxes and Value Added Tax (VAT) on tobacco to reduce smoking, these measures have not yet significantly curbed cigarette consumption (Akbari et al., 2022). In urban areas like Cirebon City, youth smoking prevalence remains relatively high. In 2020, about 17.2% of adolescents were active smokers (Nurjannah et al., 2023), with a rising trend observed in the 25–34 age group.

Economic factors play a critical role in smoking behavior. In 2022, Cirebon's per capita income was around IDR 6 million per month, while the unemployment rate stood at 6.29% in 2024. Young adults in this age group, especially those with unstable income or informal jobs, may continue to

smoke despite price increases, as smoking serves both as a habit and a form of coping under economic stress.

To address this issue, the Indonesian government issued PMK No. 191/2024, raising excise taxes on tobacco by an average of 10%, and PMK No. 131/2024, adjusting the VAT rate to 12% on certain goods including tobacco. These policies aim to reduce cigarette consumption, increase state revenue, and control the circulation of harmful goods. However, empirical studies have produced mixed results. Some research suggests that tax and price increases are not effective enough to reduce smoking (Hasiholan, 2020; Akbari et al., 2022), while others argue that taxation, when accompanied by price hikes and education, can significantly reduce cigarette use (Boachie et al., 2022; Kalousova et al., 2020).

In this context, this study investigates the influence of income, VAT increases, and cigarette excise tax increases on conventional cigarette consumption among individuals aged 20–30 in Cirebon. The research seeks to contribute to a deeper understanding of fiscal policy effectiveness in influencing smoking behavior among young adults, particularly in urban Indonesian settings.

2. Theoritical Framework and Hypothesis

2.1 Consumption Theory

Consumption theory explains household expenditure behavior in acquiring goods and services. According to Keynes (1936), consumption is primarily influenced by income, where individuals increase consumption as income rises, though not proportionally. This concept is reflected in the *Marginal Propensity to Consume* (MPC), which refers to the proportion of additional income spent on consumption. Consumption behavior must balance between satisfying needs and managing spending effectively (Marianti & Prayitno, 2020). In the context of addictive goods like cigarettes, individuals may continue consuming despite financial constraints due to dependency and perceived satisfaction (Natasya, 2021). The tendency to smoke persists even when income is limited, indicating that income remains a key factor influencing cigarette consumption levels.

2.2 Rational Addiction Theory

The Rational Addiction Theory, developed by Becker and Murphy (1988), explains the consumption of addictive goods such as tobacco, alcohol, and drugs. This theory suggests that consumers act rationally by maximizing long-term utility, even when consuming addictive substances. Enjoyment derived from consumption reinforces behavior, creating dependency over time. Importantly, rational consumers respond to price changes when prices rise, they adjust current and future consumption levels. In this view, taxation policies such as excise and VAT increases serve as deterrents. Higher cigarette prices can reduce consumption both immediately

and in the long run. Boachie et al. (2022) found that a 10% increase in cigarette prices may reduce consumption by 1% in the short term and up to 5.2% in the long term. This supports the rationale for using fiscal tools to manage cigarette consumption through price mechanisms.

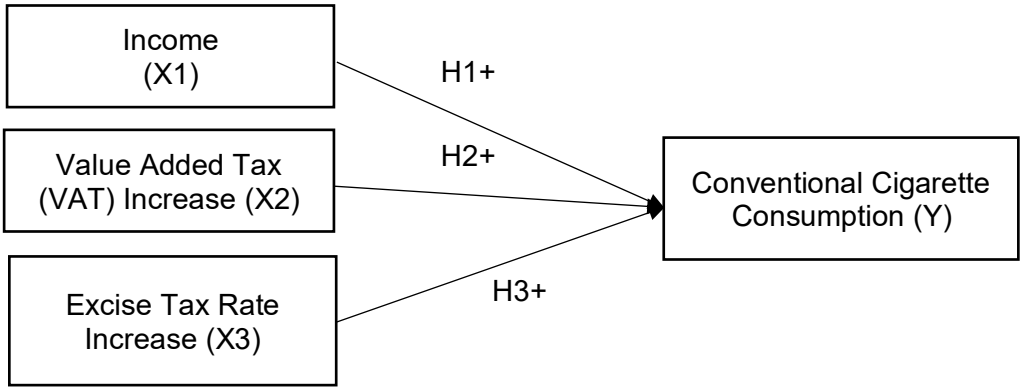

Figure 1

Framework Of Thinking

Source: Source: Data processed, (2025)

Income refers to the total earnings an individual receives over a certain period, often used for consumption and saving purposes. According to Keynes' (1936) *Absolute Income Hypothesis*, consumption is primarily determined by the level of current income. As income increases, consumption also rises, though at a decreasing rate, since a portion of income is typically saved. In the context of conventional cigarette consumption, individuals with higher income have more purchasing power and are more likely to allocate a portion of their earnings toward cigarettes. Conversely, those with lower income may reduce consumption due to financial limitations. Empirical evidence supports this relationship. Akbari et al. (2022) found that income has a positive and significant influence on cigarette consumption among individuals aged 20–30 in West Jakarta. However, other studies (e.g., Marianti & Prayitno, 2020) suggest that socioeconomic factors may have a limited direct effect, depending on context.

H1: Income (X1) has a positive effect on conventional cigarette consumption.

Value Added Tax (VAT) is a consumption tax imposed on goods and services, including tobacco products. According to Rational Addiction Theory (Becker & Murphy, 1988), smokers are sensitive to changes in cigarette prices. A rise in VAT can increase the retail price of cigarettes, leading to a decrease in disposable income and making cigarettes less affordable, especially for low- to middle-income individuals. In 2024, Indonesia raised the VAT rate from 11% to 12% through Minister of Finance Regulation No. 131/2024 to help reduce tobacco consumption. Research by Diaz et al. (2023) shows that tax increases on e-cigarettes significantly reduced consumption due to higher retail prices. However, Akbari et al. (2022) argue that VAT alone may

not affect cigarette consumption unless accompanied by substantial price changes. Thus, the success of VAT increases in reducing smoking behavior depends on their impact on final prices.

H2: The VAT increase (X2) has a positive effect on conventional cigarette consumption.

Excise taxes on tobacco products aim to reduce cigarette consumption by increasing retail prices. According to Rational Addiction Theory, price increases reduce both current and future consumption of addictive goods (Becker & Murphy, 1988). In Indonesia, excise tax hikes are directly linked to increases in retail selling prices (Harga Jual Eceran), impacting smokers' purchasing behavior.

Empirical studies support the idea that higher excise taxes reduce demand. Makarim & Purwana (2022) found that rising tobacco excise rates led to a decrease in household cigarette spending. Similarly, Gunardi et al. (2022) observed that tax increases negatively affect affordability and consumption of machine-rolled clove cigarettes. However, other studies, such as Wandita (2020), note that the effect may be indirect, depending on household income and education levels.

H3: The excise tax increase (X3) has a positive effect on conventional cigarette consumption.

3. Research Methodology

This study employs three independent variables: income, Value Added Tax (VAT) increase, and excise tax rate increase, as well as one dependent variable: conventional cigarette consumption among individuals aged 20–30 in Cirebon City. The operational definitions and measurement methods of these variables are shown in table 1.

The population in this research consists of active smokers aged 20 to 30 years residing or engaging in daily activities in Cirebon City. This age group was chosen based on national survey findings indicating a high prevalence of cigarette consumption among young adults. According to the 2024 Cirebon City Statistics Agency (BPS), there were approximately 58,560 individuals aged 20–29 years. Based on the 2024 National Socioeconomic Survey (Susenas), 18.35% of the population aged 5 years and above in Cirebon were smokers. Therefore, the estimated population of active smokers aged 20–30 years is approximately 10,750 individuals. The sample is selected using a simple random sampling technique, where each individual in the population has an equal chance of being selected. To ensure consistency with the research objectives, the respondents must meet the following criteria: (1) aged 20–30 years, (2) have a source of income, (3) have been active smokers for at least the past six months, and (4) reside or carry out regular activities in Cirebon City.

The data in this study were analyzed using SPSS version 27. The analysis began with descriptive statistics, followed by validity and reliability testing of the instrument. Classical assumption tests were then conducted, including normality, multicollinearity, heteroscedasticity, and autocorrelation tests. Multiple linear regression analysis was used to examine the effect of income, VAT increase, and cigarette excise increase on conventional cigarette consumption. Hypothesis testing was carried out both partially and simultaneously using the t-test, F-test, and the coefficient of determination to assess the contribution of the independent variables to the dependent variable.

Table 1. Operational Definition of Variable Measurement

Variable	Definition	Indicators	Measurement Scale	Source
Income (X1)	The total earnings received by an individual or household over a specific period from various sources, which directly affect household consumption.	1. Monthly income amount 2. Income stability 3. Proportion of income spent on cigarettes	Ordinal / Interval	Ghany Vhiera Nizamie & Kautsar (2021)
Value-Added Tax Increase (X2)	The rise in the VAT rate imposed by the government on goods and services, including cigarettes, which affects consumer purchasing power.	1. Awareness of VAT increase 2. Perceived price impact 3. Attitude towards VAT policy	Likert Scale	Kharisma et al. (2023)
Cigarette Excise Tax Increase (X3)	The increase in the tax rate applied to cigarettes aimed at reducing consumption, particularly among vulnerable groups.	1. Awareness of excise increase 2. Perceived price change 3. Behavioral response	Likert Scale	Sheilla Savira (2020)
Conventional Cigarette Consumption (Y)	The number of regular (non-electric) cigarettes consumed by individuals within a certain period, reflecting smoking behavior and dependence.	1. Number of cigarettes consumed per day 2. Consumption frequency 3. Dependence level	Likert Scale	CISDI (2023)

Source: Data processed, (2025)

4. Results and Discussion

4.1 Descriptive Statistical Test Results

Descriptive statistical analysis is used to provide a general overview of the basic characteristics of the variables examined in this study. The research involves three independent variables, namely income (X_1), the increase in Value Added Tax (VAT) on cigarettes (X_2), and the increase in cigarette excise rates (X_3), while conventional cigarette consumption (Y) serves as the dependent variable. This analysis aims to identify patterns and trends in each variable before

further hypothesis testing is conducted. The results of the descriptive analysis based on the collected data are presented in the following table 2.

Table 2. Descriptive Statistic Result

	N	Minimum	Maximum	Mean	Std. Deviation
Income (X1)	100	18	45	32,21	5,174
VAT Increase (X2)	100	15	41	33,02	5,123
Cigarette Excise Increase (X3)	100	19	42	32,51	5,550
Conventional Cigarette Consumption (Y)	100	16	43	32,50	5,463
Valid N (listwise)	100				

Source: SPSS Output, (2025)

The results of the descriptive statistical analysis indicate that the income variable has a minimum value of 18 and a maximum of 45, with a mean of 32.21 and a standard deviation of 5.174, suggesting that respondents' income levels are generally concentrated around the average with a moderate degree of variation. The VAT increase variable shows a minimum value of 15 and a maximum of 41, with a mean of 33.02 and a standard deviation of 5.123, indicating that respondents' perceptions of VAT increases are relatively consistent, although some variations exist. The cigarette excise increase variable ranges from a minimum of 19 to a maximum of 42, with a mean of 32.51 and a standard deviation of 5.550, reflecting a slightly broader spread but still centered around the average. Meanwhile, the conventional cigarette consumption variable has a minimum value of 16 and a maximum of 43, with a mean of 32.50 and a standard deviation of 5.463, demonstrating that consumption levels among respondents are fairly evenly distributed around the mean, with a moderate level of dispersion.

4.2 Data Quality Test

Validity Test

The validity test in this study was conducted to determine the extent to which each questionnaire item accurately measures its intended variable. The test used the Pearson Product Moment correlation method, comparing each item's score with the total score of its corresponding variable. An item is considered valid if the calculated correlation coefficient (r-count) exceeds the critical value (r-table) and the significance value is less than 0.05.

Based on the validity test results for the Income variable, all indicators (X1.1 to X1.9) show a Pearson Correlation above the r-table and a significance value below 0.05. This indicates that all items in the Income variable are valid and accurately represent the construct. Similar results are found in the variables VAT Rate Increase, Excise Tax Increase, and Conventional Cigarette Consumption. All indicators from these three variables have correlation values greater than the r-

table and very small significance levels ($p < 0.001$), which means that all questionnaire items have good construct validity.

Table 3. Validity Test Results

Variable	Indicator	Pearson Correlation	r Table	Sig.	Status
Income	X1.1	0.592	0.2324	<.001	Valid
	X1.2	0.615	0.2324	<.001	Valid
	X1.3	0.507	0.2324	<.001	Valid
	X1.4	0.516	0.2324	<.001	Valid
	X1.5	0.503	0.2324	<.001	Valid
	X1.6	0.517	0.2324	<.001	Valid
	X1.7	0.619	0.2324	<.001	Valid
	X1.8	0.538	0.2324	<.001	Valid
	X1.9	0.528	0.2324	<.001	Valid
VAT Rate Increase	X2.1	0.525	0.2324	<.001	Valid
	X2.2	0.645	0.2324	<.001	Valid
	X2.3	0.534	0.2324	<.001	Valid
	X2.4	0.530	0.2324	<.001	Valid
	X2.5	0.509	0.2324	<.001	Valid
	X2.6	0.520	0.2324	<.001	Valid
	X2.7	0.534	0.2324	<.001	Valid
	X2.8	0.579	0.2324	<.001	Valid
	X2.9	0.569	0.2324	<.001	Valid
Cigarette Excise Tax Increase	X3.1	0.525	0.2324	<.001	Valid
	X3.2	0.509	0.2324	<.001	Valid
	X3.3	0.526	0.2324	<.001	Valid
	X3.4	0.520	0.2324	<.001	Valid
	X3.5	0.566	0.2324	<.001	Valid
	X3.6	0.508	0.2324	<.001	Valid
	X3.7	0.560	0.2324	<.001	Valid
	X3.8	0.584	0.2324	<.001	Valid
	X3.9	0.605	0.2324	<.001	Valid
Conventional Cigarette Consumption	Y1.1	0.639	0.2324	<.001	Valid
	Y1.2	0.513	0.2324	<.001	Valid
	Y1.3	0.552	0.2324	<.001	Valid
	Y1.4	0.549	0.2324	<.001	Valid
	Y1.5	0.509	0.2324	<.001	Valid
	Y1.6	0.549	0.2324	<.001	Valid
	Y1.7	0.526	0.2324	<.001	Valid
	Y1.8	0.458	0.2324	<.001	Valid
	Y1.9	0.622	0.2324	<.001	Valid

Source: SPSS Output, (2025)

Reliability Test

Based on the reliability test all variables have *Cronbach's Alpha* values exceeding the standard coefficient of 0.70, indicating that the research instruments for the variables Income, VAT Rate Increase, Cigarette Excise Tax Increase, and Conventional Cigarette Consumption are reliable.

Therefore, the questionnaire used in this study is considered trustworthy and consistent in measuring each variable.

Table 4. Reliability Test Result

Variable	Cronbach's Alpha	Standard Coefficient	Number of Items	Description
Income	0.703	0.70	9	Reliable
VAT Rate Increase	0.710	0.70	9	Reliable
Cigarette Excise Tax Increase	0.704	0.70	9	Reliable
Conventional Cigarette Consumption	0.707	0.70	9	Reliable

Source: SPSS Output, (2025)

Multicollinearity Test

Multicollinearity testing is conducted to identify whether there is a strong correlation among the independent variables in a regression model. Based on Table 5, the Tolerance values for all independent variables Income (0.872), VAT Increase (0.792), and Excise Tax Increase (0.838) are above 0.1, while the VIF values are below 10, specifically 1.147, 1.263, and 1.193, respectively. These results indicate that there is no multicollinearity among the independent variables in the regression model, meaning the variables do not significantly influence each other.

Table 5. Multicollinearity Test Result

	Tolerance	VIF
1		
Income	0.872	1.147
VAT Increase	0.792	1.263
Excise Tax Increase	0.838	1.193

Source: SPSS Output, 2025

Multiple Linear Regression Analysis

Statistical analysis methods are used to understand the relationship between variables simultaneously. This study examines the influence of income, VAT increase, and cigarette excise tax increase on conventional cigarette consumption among individuals aged 20 to 30 in Cirebon City.

Table 6. Results of Multiple Regression Analysis

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	
1				
(Constant)	10.963	4.139	–	2.648
Income	0.236	0.102	0.224	2.321
VAT Increase	0.246	0.108	0.230	2.277
Cigarette Excise Tax Increase	0.179	0.097	0.182	1.851

Source: SPSS Output, (2025)

Based on Table 6, the results of the multiple linear regression analysis produce the following regression equation:

$$KRK = 10{,}963 + 0{,}236\,X1 + 0{,}246\,X2 + 0{,}179X3 + e$$

The regression results indicate that the constant value is 10.963, meaning that when all independent variables are held constant (zero), conventional cigarette consumption is estimated at 10.963 units. The income variable has a coefficient of 0.236, suggesting that for every one-unit increase in income, cigarette consumption rises by 0.236 units, indicating a positive relationship. The VAT increase has a coefficient of 0.246, showing that a one-unit increase in VAT is associated with a 0.246 unit increase in cigarette consumption. Similarly, the cigarette excise tax increase has a coefficient of 0.179, which implies a smaller but still positive effect on cigarette consumption.

Partial Significance Test (t-Test)

The t-test is used to examine the individual effect of each independent variable on the dependent variable. This test is considered significant if the significance probability value (p-value) is less than 0.05 (Ghozali, 2021).

Table 7. Partial Significance Test Results (t-Test)

Dependent Variable	Independent Variable	Sig. Value	t-value	Conclusion
Conventional Cigarette Consumption (Y)	Income (X1)	0.022	2.321	H1 Accepted – Significant Positive Effect
Conventional Cigarette Consumption (Y)	VAT Increase (X2)	0.025	2.277	H2 Accepted – Significant Positive Effect
Conventional Cigarette Consumption (Y)	Cigarette Excise Tax Increase (X3)	0.067	1.851	H3 Rejected – No Significant Effect

Source: SPSS Output, (2025)

Based on the results of the partial significance test (t-test) presented in Table 7, the income variable has a significance value of 0.022 ($p < 0.05$) and a t-statistic of 2.321, which exceeds the t-table value of 1.985 at a 5% significance level (two-tailed) and 96 degrees of freedom. This indicates that income has a significant positive effect on conventional cigarette consumption. Similarly, the increase in Value-Added Tax (VAT) also shows a significant positive influence, with a significance value of 0.025 and a t-statistic of 2.277, which is also greater than the t-table value. In contrast, the increase in cigarette excise tax has a significance value of 0.067 and a t-statistic of 1.85, which is below the critical value of 1.985. Therefore, it can be concluded that, partially, income and VAT increase significantly influence cigarette consumption, while the excise tax increase does not show a statistically significant effect on conventional cigarette consumption.

5. Conclusion

Based on the findings of this study on the influence of income, VAT increase, and cigarette excise tax increase on conventional cigarette consumption among individuals aged 20–30 in Cirebon City, it can be concluded that both income and VAT increase have a positive and significant effect on cigarette consumption. This suggests that higher income levels tend to increase individuals' ability to purchase cigarettes, aligning with Keynes's consumption theory. Additionally, the continued increase in cigarette consumption despite higher VAT rates indicates low price sensitivity within this age group. On the other hand, the cigarette excise tax increase does not have a significant effect on consumption, implying that such tax measures may be insufficient to reduce cigarette use, possibly due to nicotine addiction or a tendency to switch to cheaper brands.

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