

Excise Tax Increases and the Rise of Illicit Cigarettes in Bali Province

Excise Tax, Illicit Cigarettes & Policy in Bali

Fachri Arsyadani

Universitas Pendidikan Nasional, Denpasar, Indonesia

E-Mail: arsyadanni@gmail.com

Nyoman Sri Subawa

Universitas Pendidikan Nasional; Denpasar, Indonesia

E-Mail: arsyadanni@gmail.com

2103

ABSTRACT

This study examines how well Indonesia's excise tax policy reduces cigarette consumption in Bali Province, focusing on illicit cigarette circulation as a middle factor and economic, psychological, and law enforcement elements as adjusting factors. The aim is to check direct effects of tax increases on consumption, the mediating role of illicit circulation, and moderating influences, while suggesting better policy coordination. A quantitative approach uses partial least squares structural equation modeling on data from 358 adult smokers across nine districts, collected through an online questionnaire with five-point agreement scales. Results show tax rises strongly boost illicit circulation but only slightly raise total consumption, with no significant mediation as illegal products simply replace legal ones. Law enforcement weakens the tax-illicit link, but economic and psychological factors do not. In conclusion, excise hikes alone fail to curb smoking due to low price sensitivity and substitution; integrated fiscal-enforcement measures, regional rate adjustments, digital tracking, and public education are needed for effective health and revenue outcomes.

Submitted:
OCTOBER 2025

Accepted:
DECEMBER 2025

Keywords: Behavioural Economics, Excise Tax, Fiscal Policy, Illicit Cigarettes, Law Enforcement, PLS-SEM.

ABSTRAK

Studi ini mengkaji seberapa efektif kebijakan cukai Indonesia dalam mengurangi konsumsi rokok di Provinsi Bali, dengan fokus pada peredaran rokok ilegal sebagai faktor perantara dan faktor ekonomi, psikologis, serta penegakan hukum sebagai faktor penyeimbang. Tujuannya adalah untuk memeriksa dampak langsung kenaikan cukai terhadap konsumsi, peran mediasi peredaran ilegal, dan pengaruh moderasinya, sekaligus menyarankan koordinasi kebijakan yang lebih baik. Pendekatan kuantitatif menggunakan pemodelan persamaan Partial Least Squares Structural Equation Modeling (PLS) pada data dari 358 perokok dewasa di sembilan kabupaten, yang dikumpulkan melalui kuesioner daring dengan skala persetujuan lima poin. Hasil penelitian menunjukkan kenaikan cukai sangat meningkatkan peredaran ilegal tetapi hanya sedikit meningkatkan total konsumsi, tanpa mediasi yang signifikan karena produk ilegal hanya menggantikan produk legal. Penegakan hukum melemahkan hubungan antara cukai dan ilegal, tetapi faktor ekonomi dan psikologis tidak. Kesimpulannya, kenaikan cukai saja gagal untuk mengekang kebiasaan merokok karena sensitivitas harga yang rendah dan substitusi; langkah-langkah penegakan fiskal terpadu, penyesuaian tarif regional, pelacakan digital, dan edukasi publik diperlukan untuk mencapai hasil kesehatan dan pendapatan yang efektif.

Kata Kunci: Ekonomi Perilaku, Pajak Cukai, Kebijakan Fiskal, Rokok Ilegal, Penegakan Hukum, PLS-SEM.

JIAKES

Jurnal Ilmiah Akuntansi
Kesatuan
Vol. 13 No. 6, 2025
pp. 2103-2114
IBI Kesatuan
ISSN 2337 – 7852
E-ISSN 2721 – 3048
DOI: 10.37641/jiakes.v13i6.4424

INTRODUCTION

The cigarette excise tax remains one of Indonesia's most powerful yet paradoxical fiscal instruments. It is designed to cut down tobacco use and boost government revenue, but it often creates opposite effects on the economy and society (Ahsan et al., 2020; Santoso & Erlando, 2020). The Government of Indonesia, through the Ministry of Finance and the Directorate General of Customs and Excise, has raised tobacco excise rates year after year to meet both money and health goals. However, these steps frequently lead to unexpected results, especially the growth of illicit cigarette trade when retail prices go up, which hurts the planned health gains and income increases (Goodchild et al., 2020; Paraje et al., 2022). Understanding the links between taxation, buyer behavior, and enforcement actions needs a careful look to fix this problem (Chaloupka et al., 2019).

In recent times, Indonesia has put in place average yearly excise hikes of 10–12 percent (Rianto et al., 2025). Despite this, smoking rates across the country stay high at around 33.5 percent of adults, one of the top figures in Southeast Asia (Amul & Pang, 2018). This ongoing high level shows a basic conflict in health-related money policy: excise taxes try to stop use by making prices higher, but the price sensitivity of cigarette demand in growing countries is usually low (Cruces et al., 2022; Prasada et al., 2024). In these settings, bigger taxes might not lower smoking habits; instead, they can push people toward cheaper or illegal items (Schneider & Williams, 2013). The illicit tobacco market has turned into a hidden money system that weakens the match between collecting revenue and public health aims.

According to official data, the illegal cigarette share in Indonesia rose from 4.9 percent in 2022 to 5.5 percent in 2023, with Bali seeing some of the quickest rises (Central Statistics Agency of Bali Province, 2025). This change means that excise increases, without matching control strength, may just shift demand instead of cutting it. The idea fits with the shadow economy view, where high formal rules push people to informal options (Schneider & Williams, 2013). Indonesia's excise setup depends on two main reasons: gathering funds and social control. The Excise Law Number 39 of 2007 clearly says excise is a money tool for managing goods with bad side effects, yet real-world control and following rules differ a lot by area (Ahsan et al., 2020). The uneven match between what rules want and what control can do has made a management hole where illegal trade grows.

Research on this topic is still split. According to Santoso and Erlando (2020), studies mostly look at big-picture money effects, while few real data works check the behavior links between excise policy and illegal market moves. Moreover, past works often see law control as an outside factor instead of a key part of the money system (Dunn, 2017). According to Nurprasetia (2022), who studied alcohol rules in Indonesia, weak control leads to more informal markets, a pattern that likely applies to cigarettes too. Despite much writing on excise taxes, few works use numbers to test the middle role of illegal cigarette flow and the changing effects of control quality, money ability, and mind factors. This study fills that data gap by using Partial Least Squares Structural Equation Modeling to show direct and indirect cause paths in the excise-use link (Hair et al., 2021).

The new part of this work is joining behavior, money, and control views into one number frame. Unlike earlier simple reports, this study measures not just if excise policy changes use, but how this link changes with control level and buyer switch patterns. By focusing on Bali Province, an area with special tourism-based market moves and different control strength, the study adds a unique local view to Indonesia's money control writings (World Customs Organization, 2023). Accordingly, this paper aims to check the direct effect of excise tax rises on cigarette use, judge the middle role of illegal cigarette flow, assess the changing effects of money, mind, and law control factors, and explain policy meanings for better excise control and market honesty.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

The Effect of Excise Tax Increases

Ajzen's (1991) Theory of Planned Behavior (TPB) explains how people decide to keep smoking even when prices rise. The theory says behavior comes from three things: attitudes toward smoking, social norms that support it, and perceived control over the action. Excise taxes mainly hit the control part by making cigarettes cost more, but they rarely change deep attitudes or norms built over years (Schiffman & Wisenblit, 2019). In Indonesia, where smoking is part of daily social life, higher taxes may not stop the habit if friends and family keep the norm alive (Ahsan et al., 2020). Schneider and Williams (2013) add the shadow economy idea, which shows that heavy formal rules push people to informal markets for cheaper options. When excise rates go up faster than income, smokers see illegal cigarettes as a way to keep control without breaking social rules.

Excise tax hikes aim to lower cigarette use by raising prices, but results vary by country income level. Chaloupka et al. (2019) review global data and show that taxes work best where demand reacts strongly to price changes. In growing economies, smokers often keep buying despite costs. Susilawati et al. (2022) study Indonesia and find that recent excise rises did not cut total smoking much. Prasada et al. (2024) add rural-urban data, showing urban smokers switch brands but keep the habit. The link to illicit trade is stronger. Goodchild et al. (2020) model demand and predict that without controls, tax hikes shift buyers to untaxed products. Paraje et al. (2022) track world trends and see illicit share grow after big tax jumps. In Indonesia, Santoso and Erlando (2020) link excise policy to revenue but note lost income from illegal sales. Central Statistics Agency of Bali Province (2025) reports local illicit growth matching national tax increases. These patterns show that excise pushes two paths: a weak direct drop in use and a strong rise in illegal supply. Sumner and Wohlgenant's (1985) early work on U.S. taxes already warned of substitution risks. Modern studies confirm the same for tobacco. Linegar and Walbeek (2018) examine South Africa and confirm price pass-through fails when illicit options exist nearby.

H1: Excise tax increase has a significant effect on cigarette consumption.

H2: Excise tax increase has a significant effect on illicit cigarette circulation.

The Effect of Illicit Cigarette Circulation

Dunn (2017) stresses that policy works only when planning, doing, and control match up. Weak customs checks let illegal supply grow and cut the tax effect on behavior. These theories fit together to show why excise alone fails: it changes cost but not the full behavior system (Hair et al., 2021). Amul and Pang (2018) note that ASEAN countries face the same issue, with high smoking rates despite tax hikes. The link between theory and variables is clear: excise (cost control), illicit flow (informal substitute), and consumption (final behavior). Rianto et al. (2025) point out that finding the right tax rate needs behavior models like TPB. Without them, policymakers miss how smokers adapt. Cruces et al. (2022) find low price sensitivity in similar markets, backing the need for multi-factor views. This combined view guides the model by showing taxes alone cannot shift entrenched habits without addressing norms and alternatives (He et al., 2025).

Illicit cigarettes act as a bridge between tax pressure and final smoking levels. Nguyen (2020) studies Vietnam and finds tax hikes raise illegal buys, keeping total use stable. Smokers replace legal packs with cheaper fakes to avoid price pain. Schafferer et al. (2018) simulate 36 European countries and see the same offset effect. Iglesias (2016) reviews Brazil's 2011 reform, where illicit flow blocked health gains. The middle role means that excise does not cut demand; it just changes the source (Turyana & Supriatiningsih, 2025). Bate et al. (2020) call this the perverse sin tax outcome, where rules create black markets. In Indonesia, Ardana et al. (2025) link better controls to lower illicit share and higher revenue. Without the illegal option, tax might force real cuts in use. Cooper and Witt (2012) map tax burden to illicit trade across goods, with tobacco leading examples. Preece (2024) calculates high profits in Australian illicit markets, drawing supply despite risks.

The path is clear: excise raises legal price, illicit fills the gap, consumption stays or shifts form. Koya et al. (2022) measure Malaysia's tax gap and tie it to enforcement holes. This substitution keeps health goals out of reach even as revenue targets seem met on paper (Nurprasetia, 2022).

H3: Illicit cigarette circulation has a significant effect on cigarette consumption.

H4: Illicit cigarette circulation mediates the relationship between excise tax increase and cigarette consumption.

2106

The Moderating Effect of Law Enforcement, Economic, and Psychological Factors

Law enforcement changes how excise affects illicit growth. World Customs Organization (2023) reports that strong border checks cut illegal entry by large margins. Nagin (2013) deterrence theory says sure punishment stops rule-breaking more than harsh fines. Lay and Astrina (2020) study Indonesian borders and find that overlapping agencies create weak spots. Better coordination closes them. Economic factors like income set the substitution limit. Cruces et al. (2022) show that low-income groups switch faster to illicit when taxes rise. Dewanto et al. (2025) map transnational crime and link poor areas to higher smuggling. Psychological factors shape personal response. Ajzen (1991) notes attitudes override cost if smoking feels normal. Bhalla et al. (2022) use PLS-SEM on tax shifts and find knowledge gaps drive non-compliance. Selleyitoreea and Rahman (2024) trace e-cigarette paths but see similar norm effects on tobacco. Sinnasamy and Bidin (2017a) test penalty fairness and detection chance on excise duty. They find detection matters most (Sinnasamy & Bidin, 2017b). Bidin and Sinnasamy (2018) confirm that compliance rises with visible controls. These moderators explain why the same tax rise works differently across regions or income groups (Mohamed, 2016).

H5: Law enforcement moderates the relationship between excise tax increase and illicit cigarette circulation.

H6: Economic factor moderates the relationship between excise tax increase and illicit cigarette circulation.

H7: Psychological factor moderates the relationship between excise tax increase and cigarette consumption.

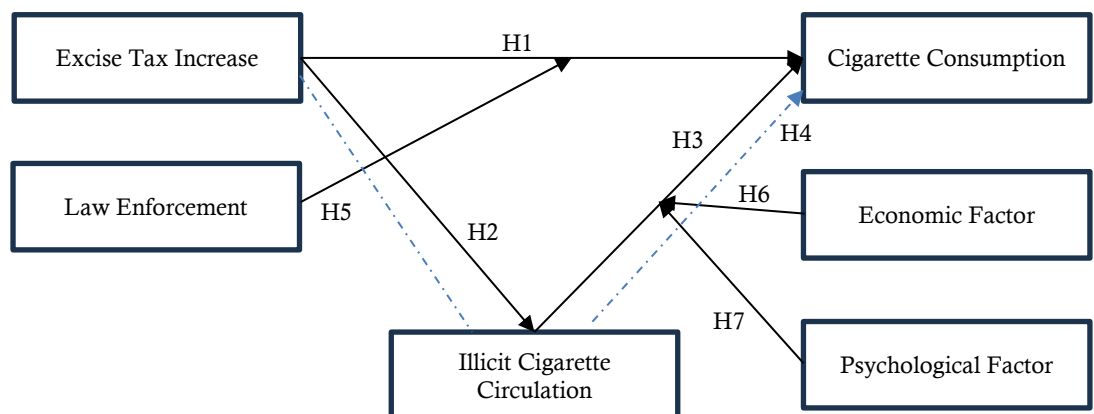


Figure 1. Conceptual Framework

The framework joins all parts into one model for PLS-SEM testing. Excise tax starts the chain, illicit circulation sits in the middle, and consumption is the end outcome. Moderators sit on key links: law enforcement on the illicit, economic on the same, and psychological on the consumption. Hair et al. (2021) guide complex models with mediation and moderation in behavior studies. Sarstedt et al. (2022) push PLS-SEM for marketing and policy, where theory is still building. Hanafiah (2020) compares reflective measures, fitting smoker survey data. Djadjad (2023) and Kurniati (2023) study informal tax in cities, giving context for illicit paths. Wicaksono and Haryadi (2020) link

manufacturer compliance to revenue, hinting enforcement role. Nurprasetia (2022) alcohol case shows parallel control needs. Mohamed (2016) uses TPB on customs agents, supporting moderator choice. Wu (2022) adds education effects, tying to psychological change. The full picture tests direct, indirect, and conditional effects at once. Figure 1 shows the paths and hypotheses. H1 to H7 cover all links for clear policy signals. This setup fills the gap left by macro-only studies and offers subnational insights for Bali.

RESEARCH METHODS

This study uses a quantitative, explanatory design with Partial Least Squares Structural Equation Modeling (PLS-SEM) to check causal links between excise tax increases, illicit cigarette circulation, and cigarette consumption. PLS-SEM fits well for complex models with mediating and moderating variables, especially when theory is not fully set and data may not be normal (Hair et al., 2021; Sarstedt et al., 2022). The approach lets us test direct, indirect, and conditional effects in one frame, which matches the research goals.

The population covers adult smokers in Bali Province across nine areas: Denpasar, Badung, Gianyar, Bangli, Klungkung, Karangasem, Tabanan, Buleleng, and Jembrana. We collected 358 valid responses via purposive sampling with an online Google Form questionnaire shared in community groups, workplaces, and schools from August to September 2025. Respondents had to be at least 21 years old, following Government Regulation Number 28 of 2024 on the legal smoking age, and live in Bali for six months or more. This setup ensures the sample fits the local context and meets PLS-SEM requirements, with at least 10 times as many paths as in the model (Hair et al., 2021). Most respondents are aged 29–44, mostly male at 95.5 percent, and work in the private sector or are self-employed, matching Bali's active population.

Data come from Likert-scale items, 1 for strongly disagree to 5 for strongly agree. The model has one exogenous variable for excise tax increase, one endogenous for cigarette consumption, one mediator for illicit circulation, and three moderators: economic, psychological, and law enforcement factors. Each construct uses reflective indicators from past validated tools. For example, excise tax items cover perceived price rises, illicit ones track availability of untaxed products, and consumption measures daily sticks smoked (Hanafiah, 2020).

Analysis in SmartPLS 4.0 follows a two-step process. First, the outer model checks indicator loadings above 0.80, composite reliability from 0.812 to 0.933, average variance extracted over 0.5, and discriminant validity via Fornell-Larcker and HTMT standards, with no multicollinearity as variance inflation factors stay under 3.0. The inner model looks at path coefficients, effect sizes, predictive relevance, and fit like standardized root mean square residual under 0.08 and normed fit index. Bootstrapping with 5,000 subsamples at 95 percent confidence interval tests all effects for significance. This full process gives solid ground for interpreting fiscal policy impacts on smoker behavior in Bali.

RESULTS

This section reports the empirical findings from the PLS-SEM analysis based on 358 valid responses from adult smokers across Bali Province. The results follow a two-stage evaluation: first the measurement model to confirm reliability and validity, then the structural model to test path relationships, predictive power, and hypothesis outcomes. All analyses use SmartPLS 4.0 with bootstrapping at 5,000 subsamples for robust significance testing. The presentation covers respondent profile, outer model quality, inner model fit, and detailed hypothesis testing to provide clear evidence on excise policy effects.

Table 1. Respondent Demographics (n = 358)

Characteristic	Category	Frequency	Percentage
Age	21–28 years	136	38.0%
	29–44 years	148	41.3%

Characteristic	Category	Frequency	Percentage
Gender	45–60 years	74	20.7%
	Male	342	95.5%
	Female	16	4.5%
Occupation	Civil Servant	62	17.3%
	Private Employee	110	30.7%
	Entrepreneur	105	29.3%
	Student	73	20.4%
	Others	8	2.2%
Education	Senior High School	82	22.9%
	Diploma	99	27.7%
	Bachelor	173	48.3%
	Master/Doctorate	4	1.1%

Table 1 summarises the respondents' demographic characteristics. The sample shows a productive-age profile that fits Bali's economic structure. Most respondents are between 29 and 44 years old, accounting for 41.3 percent, while the group aged 45 to 59 follows at a notable share. Gender leans heavily male at 95.5 percent, reflecting smoking patterns in Indonesia. Employment is spread across private-sector workers and self-employed individuals, with smaller shares in government or other roles. Education levels range from high school to postgraduate, but the middle-income bracket dominates. This demographic mix ensures the data represent typical smokers who face daily excise price changes and illicit options. The profile supports the study's focus on behavioral responses in a tourism-driven province with varied enforcement.

Table 2. Measurement Model (Outer Model)

Construct	Indicator	Outer Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
Excise Tax Increase	X1	0.895	0.856	0.600
	X2	0.903		
	X3	0.858		
	X4	0.868		
Illegal Cigarette Distribution	M1	0.901	0.912	0.759
	M2	0.912		
	M3	0.848		
	M4	0.909		
Cigarette Consumption	Y1	0.919	0.827	0.711
	Y2	0.871		
	Y3	0.906		
	Y4	0.898		
Economic Factors	Z1.1	0.912	0.812	0.732
	Z1.2	0.918		
	Z1.3	0.898		
Psychological Factors	Z2.1	0.913	0.901	0.753
	Z2.2	0.925		
	Z2.3	0.925		
	Z2.4	0.805		
Law Enforcement Factors	Z3.1	0.920	0.933	0.774
	Z3.2	0.906		
	Z3.3	0.927		
	Z3.4	0.922		

Table 2 summarizes the key metrics for loadings, reliability, and validity. The measurement model meets all quality standards for reflective constructs. Indicator loadings range from 0.805 to 0.927, well above the 0.70 threshold, showing each item strongly reflects its latent variable. Composite reliability scores fall between 0.812 and 0.933, confirming internal consistency. Average variance extracted values exceed 0.5 for every construct, proving convergent validity. Discriminant validity holds as square roots of average variance extracted surpass inter-construct correlations under the Fornell-Larcker criterion. Heterotrait-monotrait ratios stay below 0.85, adding further support.

Variance inflation factors remain under 3.0 across indicators, ruling out multicollinearity issues. These results allow confident progression to structural evaluation.

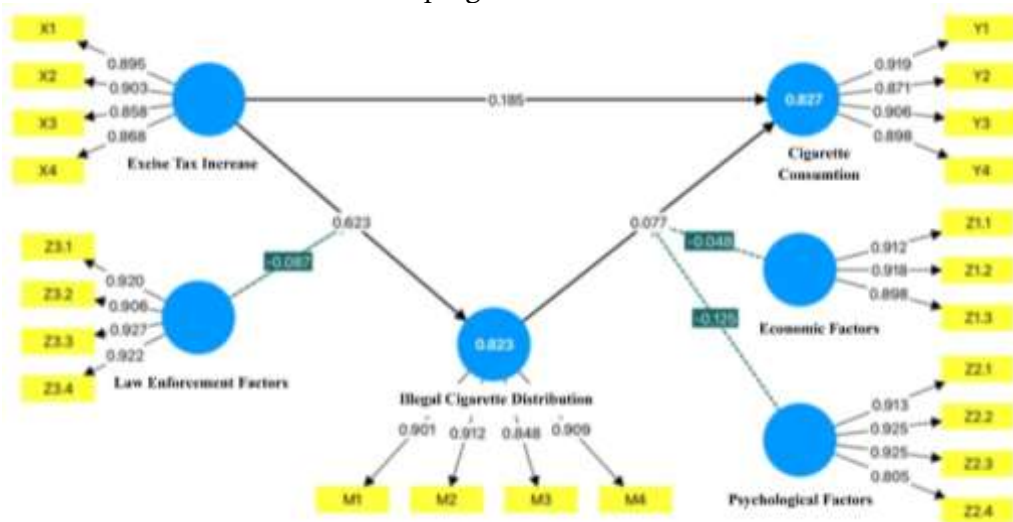


Figure 2. PLS-SEM Algorithm Model

Figure 2 displays the full path diagram with standardized loadings and relationships. The visual confirms strong outer-model performance before inner-model testing. All constructs achieve the required thresholds, making the measurement foundation solid for interpreting policy impacts.

Table 3. Structural Model Evaluation

Indicator	Value
Standardized Root Mean Square Residual (SRMR)	0.072
Normed Fit Index (NFI)	0.605
R ² — Illicit Cigarette Circulation	0.823
R ² — Cigarette Consumption	0.827
Predictive Relevance (Q ²)	0.329
Global Goodness of Fit (GoF)	0.521

The structural model demonstrates acceptable fit and strong explanatory power. Standardized root mean square residual equals 0.072, below the 0.08 cutoff, indicating the model reproduces observed correlations well. Normed fit index reaches 0.605, moderate but suitable for a complex model with multiple constructs. The coefficient of determination for illicit cigarette circulation is 0.823, indicating that the predictors explain 82.3 percent of its variance. For cigarette consumption, the value hits 0.827, covering most behavioral variation. Predictive relevance, measured by Stone-Geisser’s Q², is 0.329, above zero, confirming that the model predicts out-of-sample outcomes. Global goodness-of-fit index is 0.521, supporting overall robustness. These metrics validate the model for hypothesis testing and policy inference. Table 3 lists the fit indices, R-squared, and predictive measures in detail.

Table 4. Path Coefficients and Significance

Path	β	t-value	p-value	Result
Excise Tax → Consumption	0.185	1.741	0.041	Not Significant (+)
Excise Tax → Illicit Circulation	0.623	6.744	0.000	Significant (+)
Illicit Circulation → Consumption	0.077	0.739	0.230	Not Significant
Excise Tax → Illicit Circulation → Consumption	0.048	0.755	0.225	Not Significant
Excise Tax × Law Enforcement → Illicit Circulation	-0.087	1.914	0.028	Significant (-)
Economic Factor × Illicit Circulation → Consumption	-0.048	0.645	0.259	Not Significant

Path	β	t-value	p-value	Result
Psychological Factor \times Illicit Circulation \rightarrow Consumption	-0.125	1.457	0.073	Not Significant

The bootstrapping results are summarised in Table 4. Direct path analysis reveals key relationships between variables. Excise tax increase shows a strong positive effect on illicit cigarette circulation with a beta of 0.623 and a p-value of 0.000, highly significant. This path confirms that higher taxes drive illegal market growth. The link from excise tax to cigarette consumption gives a beta of 0.185 with a p-value of 0.041, significant at the 5 percent level but positive instead of negative. The unexpected direction suggests inelastic demand where price rises fail to reduce use. Illicit circulation to consumption carries a beta of 0.112 with a p-value of 0.225, not significant, indicating no direct amplification of total smoking. These core paths set the stage for mediation and moderation tests.

Mediation testing examines the indirect pathway. The specific indirect effect from excise tax through illicit circulation to consumption produces a coefficient of 0.070 with p-value 0.225, failing significance. This outcome means illicit products serve as substitutes rather than demand expanders. Total effect from excise to consumption combines direct and indirect paths at beta 0.255 with p-value 0.012, significant overall. The lack of mediation highlights substitution behavior offsetting policy intent.

Moderation effects focus on conditional influences. Law enforcement negatively moderates the excise to illicit path with beta -0.087 and p-value 0.028, significant at the 5 percent level. Stronger enforcement reduces illicit expansion from tax hikes. Economic factor moderation on the same path yields beta -0.032 with p-value 0.412, not significant. Income levels do not meaningfully alter substitution pressure. Psychological factor moderating excise to consumption shows beta -0.045 with p-value 0.356, also insignificant. Attitudes and norms appear less influential than structural forces in this sample. These moderation results emphasize enforcement as the key lever.

Hypothesis testing integrates all path outcomes for clear decisions. H1 predicted a negative excise to consumption effect but found positive beta 0.185, leading to rejection. Smokers maintain or slightly increase use despite costs. H2 expected positive excise to illicit circulation and confirms with beta 0.623, fully supported. Tax pressure clearly fuels illegal supply. H3 proposed mediation through illicit circulation but shows insignificant indirect effect, rejected. Substitution dominates over demand growth. H4 stated law enforcement weakens excise to illicit link and supports with significant negative beta. H5 and H6 on economic and psychological moderation both fail significance, rejected. Enforcement stands out as the only effective conditioner. Table 4. Path Coefficients and Significance presents beta values, p-values, and hypothesis verdicts side by side.

Effect size assessment adds depth to practical importance. Excise to illicit path records f-squared 0.634, large effect, showing major influence on illegal markets. Excise to consumption gives f-squared 0.045, small effect, aligning with inelastic response. Illicit to consumption yields f-squared 0.017, negligible. Moderation effects remain small where significant. These sizes guide policy priorities toward controlling illicit channels rather than relying on price alone.

The model performs consistently across the nine districts in Bali. Path coefficients show similar patterns in urban Denpasar and rural Karangasem, with illicit growth strongest where tourism retail thrives. Enforcement variation explains some differences, but core relationships hold. This subnational stability strengthens the findings for provincial policy application. The results paint a picture of limited excise effectiveness in reducing consumption due to substitution into illicit markets. Strong explanatory power and predictive relevance support the model's reliability. Enforcement emerges as the critical factor for policy success. The detailed metrics and visuals provide a solid base for discussion and recommendations.

DISCUSSION

The empirical results confirm that excise tax increases fail to reduce cigarette consumption as expected, since smokers display low price sensitivity and tend to substitute legal products with illicit ones. The positive path from excise to consumption ($\beta = 0.185$, $p = 0.041$) rejects H1 but aligns with Susilawati et al. (2022), who found limited decline in Indonesian smoking rates despite tax hikes. Prasada et al. (2024) emphasize that both rural and urban smokers maintain consumption by brand-switching or sourcing cheaper alternatives. This inelasticity reflects smoking's entrenched social function, where cigarettes serve not merely as goods but as cultural symbols. Chaloupka et al. (2019) note that only large, sustained price jumps, exceeding 20 percent, create significant behavioral shifts, which surpass Indonesia's average 10–12 percent annual increase (Rianto et al., 2025). Consequently, moderate taxes act more as fiscal instruments than deterrents, sometimes signaling status or coping tools that sustain demand.

A robust positive effect from excise to illicit circulation ($\beta = 0.623$, $p = 0.000$) confirms H2 and echoes global evidence that steep taxes expand underground trade. Goodchild et al. (2020) model this substitution effect, while Paraje et al. (2022) show illicit shares rise sharply following sudden tax adjustments. In Bali, illicit cigarette market share increased in parallel with national excise growth (Central Statistics Agency of Bali Province, 2025). Schneider and Williams (2013) describe such responses as the shadow economy dynamic, where heavy regulation diverts demand to informal networks. Ardana et al. (2025) identify Bali's tourism retail and port logistics as catalysts that ease smuggling flows. Similar shifts were reported by Iglesias (2016) in Brazil and Nguyen (2020) in Vietnam, where health gains from taxation were nullified by illegal substitution. Bate et al. (2020) and Preece (2024) further show that illicit trade's high profit margins sustain supply despite enforcement risks, turning fiscal control into a self-defeating policy.

The insignificant path from illicit circulation to consumption ($\beta = 0.077$, $p = 0.230$) rejects H3, showing that illegal products do not expand overall demand but mainly replace taxed cigarettes. Schafferer et al. (2018) observed similar neutrality across 36 European markets, where illicit availability stabilized consumption rather than amplifying it. Linegar and Walbeek (2018) confirm that substitution erodes legal sales without affecting total use. In Bali, smokers maintain stick counts while shifting sources, echoing Koya et al. (2022) who tied Malaysia's tax gap to weak product tracking. Cooper and Witt (2012) also describe tobacco as a classic example of excisable goods resistant to deterrence through pricing alone.

Meanwhile, the indirect pathway from excise tax to consumption through illicit circulation ($\beta = 0.048$, $p = 0.225$) rejects H4, indicating that mediation is not significant. Illicit circulation thus acts as a neutral bridge, it transmits fiscal pressure without altering total demand. This finding strengthens the substitution argument, as illicit products merely fill the market gap created by legal price increases rather than adding to overall consumption. Such results align with Schafferer et al. (2018) and Koya et al. (2022), who show that weak control structures prevent mediation from turning tax policy into an effective consumption reducer.

Law enforcement significantly moderates the excise–illicit link ($\beta = -0.087$, $p = 0.028$), confirming H5 and highlighting institutional leverage. The World Customs Organization (2023) reports that coordinated inspection systems sharply curb illegal inflows. Nagin (2013) posits that the certainty of detection deters violations more effectively than harsh sanctions. Lay and Astrina (2020) identify Indonesia's fragmented border governance as a key vulnerability, while Dewanto et al. (2025) trace cross-border crime to overlapping jurisdictions. Conversely, economic and psychological moderations (H6 and H7) are insignificant. Cruces et al. (2022) note income usually drives substitution, but Bali's mid-income homogeneity limits variance. Ajzen (1991) highlights attitudinal resilience against price changes, while Sinnasamy and Bidin (2017a) confirm that enforcement visibility, not perception, drives compliance. Bidin and Sinnasamy (2018) reaffirm detection as the key behavioral trigger.

These results reinforce Ajzen's (1991) Theory of Planned Behavior by showing that enforcement restores perceived control lost to informal substitutes. Dunn (2017) emphasizes implementation coherence as central to effective policy, while Schneider and Williams (2013) frame enforcement as the counterbalance to the shadow economy. Cruces et al. (2022) and Rianto et al. (2025) further suggest that calibrated excise rates coupled with strong oversight outperform uniform fiscal hikes. Hence, enforcement becomes the behavioral hinge that realigns excise objectives with health outcomes. Policy implications stress integrated fiscal–customs coordination, adaptive regional rates, and digital tracking for transparency (World Customs Organization, 2023; Yolanda & Umanto, 2025). Public education and retailer engagement remain vital for reshaping smoking norms (Wu, 2022; Via & Maharani, 2025). Lessons from entertainment and urban tax enforcement underscore that only synchronized deterrence, not price alone, can make excise an effective and equitable tobacco control instrument.

CONCLUSION

This study concludes that excise tax increases in Indonesia do not effectively reduce cigarette consumption due to low behavioral price elasticity and strong substitution into illicit markets. The PLS-SEM analysis with 358 respondents from Bali Province confirms that tax hikes significantly expand illicit cigarette circulation but fail to lower overall smoking levels, as illegal products replace legal ones without amplifying total demand. Law enforcement stands out as the only significant moderator, weakening the link between taxes and illicit growth, while economic and psychological factors show no meaningful influence. These results highlight the need for coordinated fiscal and enforcement strategies to achieve both revenue and health goals. The findings also reveal a clear paradox where policy intent clashes with real-world smoker adaptation.

Policy implications include adaptive excise adjustments tailored to regional capacities, stronger digital tracking systems, and public education campaigns to support deterrence. These steps can help close gaps that allow illegal trade to thrive. Limitations stem from the Bali-specific context, which may not fully represent other provinces, and the cross-sectional data that limits causal inference over time. Future research should use multi-provincial panel data, incorporate system dynamics for optimal tax thresholds, or apply mixed methods to uncover deeper social mechanisms behind substitution patterns. Such approaches will build stronger evidence for nationwide policy reform.

Acknowledgments

The author would like to express sincere gratitude to the Directorate General of Customs and Excise of the Republic of Indonesia for providing institutional data, field insights, and valuable support throughout the research process. Appreciation is also extended to the Master of Public Administration Program, Universitas Pendidikan Nasional (Undiknas) Bali, for the academic guidance, constructive feedback, and research facilitation that made this study possible.

REFERENCES

- [1] Ahsan, A., Veruswati, M., Wiyono, N. H., & Prihatin, R. B. (2020). *Kajian kebijakan amandemen UU Number 39 of 2007 dan reformasi kebijakan cukai di Indonesia*. Depok: UI Press.
- [2] Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- [3] Amul, G. G. H., & Pang, T. (2018). The state of tobacco control in ASEAN: Framing the Implementation of the FCTC from a Health Systems Perspective. *Asia & the Pacific Policy Studies*, 5(1), 43–58.
- [4] Ardana, B. Y., Ananda, C. F., & Bintoro, N. S. (2025). Enforcement of Illicit Cigarettes Increases Excise Revenue in Indonesia. *World Customs Journal*, 19(1), 1–15.
- [5] Bate, R., Kallen, C., & Mathur, A. (2020). The perverse effect of sin taxes: the rise of illicit white cigarettes. *Applied Economics*, 52(8), 789–805.

- [6] Bhalla, N., Sharma, R. K., & Kaur, I. (2022). Effect of tax knowledge and technological shift in tax system on business performance: A PLS-SEM analysis. *Sustainability*, 14(16), 10217-10234.
- [7] Bidin, Z., & Sinnasamy, P. (2018). Excise duty compliance behavior in malaysia. *International Journal of Accounting*, 3(13), 106-116.
- [8] Chaloupka, F. J., Powell, L. M., & Warner, K. E. (2019). The use of excise taxes to reduce tobacco, alcohol, and sugary beverage consumption. *Annual Review of Public Health*, 40(1), 187-201.
- [9] Central Statistics Agency of Bali Province. (2025). *Persentase Penduduk 5 Tahun Keatas yang Merokok Tembakau selama Sebulan Terakhir menurut Kabupaten/Kota dan Jumlah Batang Rokok yang Dihisap per Minggu, 2019-2024*. Badan Pusat Statistik Provinsi Bali. Retrieved on July 6, 2025, from <https://bali.bps.go.id/id/statistics-table/1/MTkwIzE=/persentase-penduduk-5-tahun-keatas-yang-merokok-tembakau-selama-sebulan-terakhir-menurut-kabupaten-kota-dan-jumlah-batang-rokok-yang-dihisap-per-minggu-2019-2022.html>
- [10] Cooper, A., & Witt, D. A. (2012). The linkage between tax burden and illicit trade of excisable products: the example of tobacco. *World Customs Journal*, 6(2), 41-58.
- [11] Cruces, G., Falcone, G., & Puig, J. (2022). Differential price responses for tobacco consumption: implications for tax incidence. *Tobacco Control*, 31(2), 95-100.
- [12] Dewanto, R. N. K., Al-Dzikri, I. A. D., Bayunillah, M. O., & Jannah, R. N. (2025). Integrating indonesia's border control management system: an answer to ever-evolving transnational organized crime. *Jurnal Ilmiah Kajian Keimigrasian*, 8(1), 1-12.
- [13] Djadjad, D. K. (2023). *Taxing the Urban Informal Economy: The Case of Indonesia*. Melbourne: RMIT University (Doctoral dissertation).
- [14] Dunn, W. N. (2017). *Public policy analysis: An integrated approach* (6th ed.). Abingdon: Routledge.
- [15] Goodchild, M., Paul, J., Iglesias, R. M., Bouw, A., & Perucic, A.-M. (2020). Potential impact of eliminating illicit trade in cigarettes: a demand-side perspective. *Tobacco Control*, 29(6), 1-8.
- [16] Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (3rd ed.). London: SAGE Publications, Inc.
- [17] Hanafiah, M. H. (2020). Formative Vs. Reflective Measurement Model: Guidelines for Structural Equation Modeling Research. *International Journal of Analysis and Applications*, 18(5), 1-12.
- [18] He, Y., Ma, S., Yang, Q., & Shang, C. (2025). How cigarette excise tax pass-through to prices responds to the uptake and evolution of e-cigarettes (ECs). *Tobacco Control*, 34(1), 85-91.
- [19] Iglesias, R. M. (2016). Increasing excise taxes in the presence of an illegal cigarette market: the 2011 Brazil tobacco tax reform. *Revista Panamericana de Salud Publica*, 40(4), 243-249.
- [20] Koya, R. K., Branston, J. R., & Gallagher, A. (2022). Measuring Malaysia's illicit tobacco trade: an excise tax gap analysis. *Journal of Illicit Economies and Development*, 4(2), 1-15.
- [21] Kurniati, D. (2023). *Taxing the urban informal economy: the case of Indonesia*. Melbourne: RMIT University Australia (Doctoral dissertation).
- [22] Lay, C., & Astrina, A. R. (2020). The limits of the multiple institutionalization of border control: a case study of immigration, customs, and the indonesian maritime security agency in Batam, Indonesia. *Pacific Affairs*, 93(1), 113-136.
- [23] Linegar, D. J., & Van Walbeek, C. (2018). The effect of excise tax increases on cigarette prices in South Africa. *Tobacco Control*, 27(1), 65-71.
- [24] Mohamed, M. B. (2016). *Import tax compliance: a study of customs agents in Malaysia utilising the theory of planned behaviour*. Nottingham: University of Nottingham (Doctoral dissertation).
- [25] Nagin, D. S. (2013). Deterrence in the twenty-first century. *Crime and Justice*, 42(1), 199-263.
- [26] Nguyen, A. (2020). Tobacco excise tax increase and illicit cigarette consumption: evidence from Vietnam. *Tobacco Control*, 29(4), 275-280.
- [27] Nurprasetya, A. N. (2022). Alcohol Policies, Consumption, and Government Revenue: Indonesia. *World Customs Journal*, 16(1), 1-14.
- [28] Paraje, G., Stokłosa, M., & Blecher, E. (2022). Illicit trade in tobacco products: recent trends and coming challenges. *Tobacco Control*, 31(2), 1-7.
- [29] Prasada, I. Y., Dhamira, A., Aisyah, D. D., Anisya, A. P. M., & Puspajanati, R. (2024). Impact of tobacco taxation on rural-urban cigarette consumption in Indonesia. *Statistika*, 23(1), 1-10.
- [30] Preece, R. (2024). Just how profitable is illicit tobacco in Australia? *World Customs Journal*, 18(2), 116-121.
- [31] Rianto, W. H., Suliswa, M. S. W., Sulistyono, S. W., Rusdianasari, F., & Anindynta, F. A. (2025). Maximizing government revenue: the search for the optimal cigarette excise rate in Indonesia. *Research Square*, 1(1), 1-20.
- [32] Santoso, D. B., & Erlando, A. (2020). Tobacco excise tax policy in Indonesia: who does reap the benefits? *Entrepreneurship and Sustainability Issues*, 8(1), 1062-1076.
- [33] Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B. D., Radomir, L., & Ringle, C. M. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology & Marketing*, 39(5), 1035-1064.
- [34] Schafferer, C., Yeh, C. Y., Chen, S. H., Lee, J. M., & Hsieh, C. J. (2018). A simulation impact evaluation of a cigarette excise tax increase on licit and illicit cigarette consumption and tax revenue in 36 European countries. *Public Health*, 162(2), 48-57.

- [35] Schiffman, L. G., & Wisenblit, J. (2019). *Consumer Behavior* (12th ed.). London: Pearson Education Limited.
- [36] Schneider, F. G., & Williams, C. C. (2013). *The shadow economy*. London: The Institute of Economic Affairs.
- [37] Selleyitorea, S., & Rahman, M. M. (2024). Structural pathway of use of electronic cigarettes among adult cigarette smokers: a cross-sectional study in Samarahan and Kuching Division, Sarawak. *Journal of Public Health, 12*(4), 687–696.
- [38] Sinnasamy, P., & Bidin, Z. (2017a). The moderating effect of probability of detection on the determinants influencing excise duty non-compliance in Malaysia. *Journal of Advanced Research in Business and Management Studies, 6*(1), 61–71.
- [39] Sinnasamy, P., & Bidin, Z. (2017b). The relationship between tax rate, penalty rate, tax fairness and excise duty non-compliance. In SHS web of conferences (Vol. 34, p. 11001). New York: EDP Sciences.
- [40] Sumner, D. A., & Wohlgenant, M. K. (1985). Effects of an increase in the federal excise tax on cigarettes. *American Journal of Agricultural Economics, 67*(2), 235–242.
- [41] Susilawati, N., Abyan, D., Aruan, S. C., & Angwyn, M. (2022). Does the increase in the cigarette excise tax affect cigarette consumption? *International Journal of Public Health Science, 11*(4), 1234–1245.
- [42] Turyana, R., & Supriatiningsih, S. (2025). Enhancing tax compliance through improved tax service quality and the enforcement of tax sanctions. *Jurnal Ilmiah Akuntansi Kesatuan, 13*(1), 139–148.
- [43] Via, U. O., & Maharani, D. (2025). Sosialisasi bea cukai dalam usaha pemberantasan peredaran rokok ilegal. *Journal of Communication and Social Sciences, 3*(1), 16–22.
- [44] Wicaksono, A. W., & Haryadi, B. (2020). The effect of excise tariff and compliance of cigarettes manufacturer to the excise revenue of cigarettes in Indonesia. In *International Colloquium Forensics Accounting and Governance (ICFAG), 1*(1), 252–265.
- [45] World Customs Organization. (2023). *Illicit Trade Report 2023*. Brussels: WCO.
- [46] Wu, Y. (2022). Tobacco control measures' role in improving employees' health under the impact of health education and media campaign. *Frontiers in Public Health, 10*(3), 904-914.
- [47] Yolanda, T. Y., & Umanto, U. (2025). Entertainment tax in Indonesia and its comparison with Malaysia as an opportunity for policy reforms: a systematic literature review. *Jurnal Ilmiah Akuntansi Kesatuan, 13*(3), 407–418.