

# THE EFFECT OF TAX AWARENESS AND PERCEIVED EQUITY ON TAX COMPLIANCE OF DIGITAL ECONOMY ACTORS IN BATAM: THE MODERATING ROLE OF VAT ON ELECTRONIC TRANSACTION (PPN PMSE) COLLECTION POLICY

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## Abstract

The rapid expansion of Indonesia's digital economy demands a strengthened digital taxation framework. This study examines the effect of tax awareness and perceived equity on tax compliance among digital economy actors in Batam, Indonesia's largest Free Trade Zone (FTZ), with the Value Added Tax on Electronically Traded Transactions (PPN PMSE) collection policy serving as a moderating variable. Using a quantitative cross-sectional survey, data were collected from 198 digital economy actors across Batam's major e-commerce ecosystems through validated Likert-scale questionnaires and analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) with SmartPLS 4.0. The findings reveal that: (1) tax awareness exerts the strongest positive and significant effect on tax compliance ( $\beta = 0.412$ ;  $p < 0.001$ ;  $f^2 = 0.224$ ); (2) perceived equity positively and significantly affects tax compliance ( $\beta = 0.318$ ;  $p < 0.001$ ;  $f^2 = 0.138$ ); (3) the PPN PMSE collection policy positively and significantly moderates the tax awareness–compliance relationship ( $\beta = 0.147$ ;  $p < 0.01$ ); however, (4) the PPN PMSE collection policy does not significantly moderate the perceived equity–compliance relationship ( $\beta = 0.063$ ;  $p > 0.05$ ). These findings reveal an asymmetric moderation effect: platform-based VAT collection functions as a behavioral nudge that amplifies tax awareness effects but is structurally incapable of correcting deeply rooted perceptions of tax inequity—particularly the perceived unfairness between FTZ-based and non-FTZ digital sellers, and between digital and conventional businesses. The study contributes to digital taxation literature by integrating the Slippery Slope Framework with Nudge Theory, empirically demonstrating the conditional and asymmetric moderating capacity of third-party collection mechanisms, and identifying a novel “spatial equity” dimension relevant to free trade zone taxation. Practical implications are offered for Indonesia's Coretax administration reform and the design of differentiated compliance strategies.

**Keywords:** *tax awareness, perceived equity, tax compliance, VAT PMSE, digital economy*

## 1. INTRODUCTION

Digital transformation has fundamentally reshaped Indonesia's economic landscape and, with it, the terrain of tax administration. Data from the Directorate General of Taxes (DJP) indicate that VAT revenue from Electronically Traded Transactions (Perdagangan Melalui Sistem Elektronik, or PMSE) has grown significantly, with 193 appointed VAT collectors and PMSE VAT receipts reaching IDR 6.7 trillion in 2023 (DJP, 2024). This growth reflects the massive expansion of the digital economy, which has outpaced the capacity of conventional tax systems to capture it comprehensively. Simultaneously, the implementation of the Coretax DJP system beginning in January 2025 marks a new era of digital tax administration, aiming to integrate all taxation services into a single unified platform (DJP, 2026). Batam, designated as a Free Trade Zone and Free Port Area (Kawasan Perdagangan Bebas dan Pelabuhan Bebas, or KPBPB), presents a uniquely compelling context for studying digital economy tax compliance. As a Free Trade Zone (FTZ), Batam enjoys exemptions from Value Added Tax (VAT) and import duties on goods entering the zone (BP Batam, 2025). However, this privilege creates considerable tax complexity for digital economy actors: when they sell products to consumers outside the FTZ through marketplace platforms, standard VAT provisions apply. Batam's geographical proximity to Singapore—merely

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a 45-minute ferry ride—further facilitates cross-border e-commerce transactions that add yet another layer of compliance complexity. The Financial Services Authority (OJK) of the Riau Islands province has reported that financial literacy and regulatory awareness among workers and business operators in Batam remain areas requiring substantial improvement (OJK Riau Islands, 2026). In the taxation context, low tax awareness among digital economy actors constitutes a primary driver of inadequate voluntary compliance. DJP data indicate that Indonesia's economic structure—dominated by informal sector and MSMEs, including digital economy participants—poses a persistent challenge to raising the tax ratio to its full potential (DJP, 2024). Research by DDTC Fiscal Research mapped that MSME operators generally lack tax literacy, fail to understand tax functions and benefits, and struggle to differentiate between types of tax obligations (Bawono, 2023).

Beyond tax awareness, perceived equity—the perceived fairness of the tax system—represents an important determinant of compliance that has been well-established in the literature (Kirchler et al., 2008; Wenzel, 2003). In Batam's context, perceived equity faces distinctive challenges: digital economy actors within the FTZ observe inconsistent tax treatment between conventional transactions (which enjoy VAT exemptions) and digital cross-zone transactions. This perception of inequity has the potential to undermine voluntary compliance, as predicted by theories of tax justice (Adams, 1965; Tyler, 2006). The DJP's policy of appointing PMSE VAT collectors represents an innovative withholding mechanism for the digital economy. Through this policy, digital platforms such as Shopee, Tokopedia, and TikTok Shop are designated as parties responsible for collecting, depositing, and reporting VAT on transactions conducted through their platforms. Conceptually, this policy functions as an enforcement mechanism that may strengthen or weaken the relationship between internal factors (awareness and perceived equity) and tax compliance. This study positions the PPN PMSE collection policy as a moderating variable, arguing that third-party collection mechanisms alter the decision-making context for tax compliance: automatic platform-based collection may reinforce the effect of tax awareness by providing an enforcement nudge, yet may prove unable to address structurally rooted perceptions of inequity.

Prior studies on digital economy tax compliance have been conducted in various countries (Niu, 2022; Olbert & Spengel, 2021; Aslam & Shah, 2022), yet research specifically examining the moderating role of PMSE VAT collection policy in a free trade zone context remains notably sparse. Indonesian studies have largely focused on conventional MSME tax compliance (Savitri & Musfialdy, 2016; Rahayu, 2023) or the normative regulatory aspects of PPN PMSE (Darussalam et al., 2021), without integrating empirical analysis of how collection mechanisms moderate the psychological determinants of compliance. Accordingly, this study aims to: (1) analyze the effect of tax awareness on tax compliance among digital economy actors in Batam; (2) analyze the effect of perceived equity on tax compliance; (3) examine the moderating role of PPN PMSE collection policy on the tax awareness–compliance relationship; and (4) examine the moderating role of PPN PMSE collection policy on the perceived equity–compliance relationship. The study contributes to digital taxation literature by providing empirical evidence on the effectiveness and limitations of third-party collection mechanisms in moderating the psychological determinants of tax compliance, and offers policy implications for digital tax administration reform in Indonesia.

## 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### a. Theoretical Foundations: The Slippery Slope Framework and Nudge Theory

This study integrates two complementary theoretical frameworks. First, the Slippery Slope Framework (Kirchler et al., 2008) posits that tax compliance is determined by two dimensions: trust in authorities (which drives voluntary compliance) and power of authorities (which drives enforced compliance). Within this framework, tax awareness relates to the trust-driven voluntary compliance dimension, while the PPN PMSE collection policy represents the power-driven enforced compliance dimension. Perceived equity functions as a bridge between the two: when the system is perceived as fair, trust increases and voluntary compliance is bolstered; when perceived as unfair, even strong enforcement may prove ineffective.

Second, Nudge Theory (Thaler & Sunstein, 2008) provides a lens for understanding the moderation mechanism of the PPN PMSE collection policy. From a nudge perspective, the designation of digital platforms as VAT collectors functions as choice architecture that shifts the default compliance behavior from opt-in (taxpayers must actively decide to comply) to opt-out (compliance occurs automatically through platform-based collection, unless taxpayers actively circumvent it). The integration of these frameworks enables comprehensive analysis of how internal factors (awareness, equity perception) interact with external mechanisms (collection policy) in shaping digital tax compliance.

## **b. Tax Awareness and Tax Compliance**

Tax awareness is defined as the degree to which taxpayers are conscious of and knowledgeable about their tax obligations, rights, and the benefits of taxation (Palil et al., 2023). For digital economy actors, tax awareness encompasses understanding of the taxable turnover threshold (IDR 500 million for income tax exemption), the 0.5% final income tax rate for MSMEs, VAT mechanisms for cross-zone transactions, and reporting obligations through the Coretax system. Fischer's Tax Compliance Model (Fischer et al., 1992) positions tax knowledge and awareness as primary antecedents of compliance. Individuals who understand the tax system tend to assess non-compliance risks more accurately and hold more positive attitudes toward tax obligations. Empirical research has consistently confirmed this positive relationship. Palil et al. (2023) found that tax awareness significantly enhances voluntary compliance among Malaysian taxpayers. Savitri and Musfiaily (2016) confirmed similar findings among taxpayers in Riau, Indonesia. More specifically, Rahayu (2023) demonstrated that understanding digital tax regulations increases compliance among Indonesian online MSME operators. Based on these arguments:

**H1: Tax awareness has a positive and significant effect on tax compliance among digital economy actors in Batam.**

## **c. Perceived Equity and Tax Compliance**

Perceived equity in taxation refers to taxpayers' perception of tax system fairness across three dimensions: distributive equity (fairness in the distribution of tax burdens), procedural equity (fairness of administrative procedures), and retributive equity (fairness of benefits received relative to taxes paid) (Gerbing, 1988; Gilligan & Richardson, 2005). Equity Theory (Adams, 1965) explains that individuals evaluate fairness by comparing their own input-output ratio with that of referent others. In the context of digital economy actors in Batam, perceived equity faces distinctive challenges. First, digital sellers transacting across FTZ and non-FTZ zones encounter differential VAT treatment—goods sold within the FTZ are VAT-exempt, but when sold through marketplace platforms to consumers outside the FTZ, standard VAT applies. Second, digital actors perceive that they bear a disproportionately heavier compliance burden compared to conventional businesses because their digital transaction trails are more easily traced by tax authorities (Niu, 2022). Third, perceptions about retributive equity—whether the public infrastructure and services received in Batam are commensurate with taxes paid—influence willingness to comply. Wenzel (2003) and Murphy (2004) have demonstrated that perceived equity is a strong predictor of voluntary tax compliance. Faizal et al. (2023) further confirmed that perceived tax fairness significantly affects MSME tax compliance in Southeast Asia:

**H2: Perceived equity has a positive and significant effect on tax compliance among digital economy actors in Batam.**

## **d. The Moderating Role of PPN PMSE Collection Policy**

The policy of appointing PMSE VAT collectors implements a third-party reporting and withholding mechanism within the digital economy context. Regulatory authority derives from Law Number 2 of 2020 and Ministry of Finance Regulation (PMK) Number 48/PMK.03/2020, which empower DJP to designate PMSE business actors as VAT collectors. From the Nudge Theory perspective, this policy functions as a salience nudge—making tax obligations more visible and salient for digital economy actors transacting through platforms. Research on third-party reporting consistently demonstrates that collection mechanisms administered by third parties increase tax compliance (Kleven et al., 2011; Slemrod, 2019). However, the moderation effect of these mechanisms on the psychological determinants of compliance remains underexplored. Conceptually, the PPN PMSE collection policy is expected to strengthen the effect of tax awareness on compliance: when digital actors already possess high tax awareness, the presence of automatic platform-based collection provides convenience and reinforces their compliance intention. Conversely, the moderation effect on perceived equity is theoretically more ambiguous: automatic collection may be unable to correct structurally rooted perceptions of unfairness—such as inequitable treatment between FTZ and non-FTZ actors, or between digital and conventional businesses—because automatic collection alters the administrative mechanism of taxation, not the substance of tax policy (Olbert & Spengel, 2021):

**H3: The PPN PMSE collection policy positively moderates the effect of tax awareness on tax compliance among digital economy actors in Batam.**

**H4: The PPN PMSE collection policy positively moderates the effect of perceived equity on tax compliance among digital economy actors in Batam.**

**3. RESEARCH METHODOLOGY**

**a. Research Design and Population**

This study employs a quantitative approach with a cross-sectional survey design. The population comprises digital economy actors in Batam City who conduct trade in goods and/or services through electronic systems and bear tax obligations. Digital economy actors are operationally defined as individuals or business entities that sell products or services through marketplaces (Shopee, Tokopedia, TikTok Shop, Lazada), social media platforms (Instagram, Facebook, WhatsApp Business), or proprietary websites.

**b. Sample and Sampling Technique**

Purposive sampling combined with snowball sampling was employed, with the following inclusion criteria: (1) business operators selling goods/services online through digital platforms; (2) domiciled and operating in Batam City; (3) possessing a Tax Identification Number (NPWP) or integrated National Identification Number (NIK); (4) minimum monthly digital business turnover of IDR 5 million; (5) minimum one year of digital business operation. Initial respondent access points included digital MSME communities in Batam, the Batam City Cooperative and MSME Agency, and the North Batam and South Batam Tax Service Offices (KPP Pratama). Sample size determination follows Hair et al. (2021), who recommend a minimum of 10 times the largest number of structural paths directed at any single construct. To ensure robustness, 220 questionnaires were distributed online (Google Form) through digital seller community groups, yielding 198 valid responses after eliminating incomplete data and outliers (response rate: 90.0%).

**c. Variable Operationalization**

All variables were measured using 5-point Likert scales (1 = Strongly Disagree to 5 = Strongly Agree). The operationalization of each variable is presented in Table 1.

**Table 1. Variable Operationalization**

Variable	Operational Definition	Indicators	Adapted From
Tax Awareness (X1)	Level of taxpayer awareness and understanding of digital tax obligations, rights, and benefits	5 items: understanding of tax obligations, knowledge of MSME tax rate, awareness of tax-exempt threshold, understanding of digital VAT, awareness of tax benefits	Palil et al. (2023); Savitri & Musfialdy (2016); Rahayu (2023)
Perceived Equity (X2)	Perception of tax system fairness across distributive, procedural, and retributive dimensions	6 items: inter-business tax burden fairness, FTZ vs non-FTZ equity, administrative procedural fairness, transparency of tax utilization, rate proportionality, digital vs conventional equality	Gerbing (1988); Gilligan & Richardson (2005); Faizal et al. (2023)
PPN PMSE Policy (M)	Perception of the effectiveness, transparency, and impact of platform designation as VAT collector	5 items: understanding of collection mechanism, perceived transparency, impact on selling price, platform-facilitated compliance ease, trust in mechanism	Kleven et al. (2011); Slemrod (2019); Darussalam et al. (2021)
Tax Compliance (Y)	Degree of formal and material fulfillment of tax obligations by digital economy actors	6 items: NPWP registration, timely tax return filing, timely payment, accurate turnover reporting, digital transaction recording, Coretax system usage	Kirchler et al. (2008); DJP (2024); Rahayu (2023)

Source: Compiled from various sources (2025)

#### **d. Data Analysis**

Data analysis employed SEM-PLS with SmartPLS 4.0 software. PLS-SEM was selected based on: (1) suitability for predictive models with moderation variables (Hair et al., 2021); (2) flexibility regarding data distribution assumptions (Sarstedt et al., 2022); (3) capacity to handle complex models with moderate sample sizes (Henseler et al., 2015). Evaluation proceeded in two stages: the outer model (convergent validity:  $AVE \geq 0.50$ ; reliability:  $CR \geq 0.70$ ; discriminant validity:  $HTMT < 0.90$ ) and the inner model ( $R^2$ ,  $f^2$ ,  $Q^2$ , bootstrapping with 5,000 subsamples). The moderation effect was analyzed using the product indicator approach, which is recommended for PLS-SEM moderation analysis (Hair et al., 2021).

### **4. RESULTS AND DISCUSSION**

#### **a. Respondent Profile**

Of the 198 valid respondents, gender distribution was relatively balanced (male: 53.5%; female: 46.5%). The age profile was dominated by the 25–34 cohort (44.9%), followed by 18–24 (24.7%), 35–44 (22.2%), and above 44 (8.1%). Educational attainment was predominantly senior high school/vocational (38.4%), followed by bachelor's degree (34.3%), diploma (21.2%), and postgraduate (6.1%). By platform type, the majority utilized domestic marketplaces such as Shopee and Tokopedia (42.4%), followed by social commerce via Instagram and WhatsApp Business (27.3%), cross-border e-commerce (17.7%), and digital service providers (12.6%). Monthly turnover was concentrated in the IDR 5–50 million range (57.6%), IDR 50–100 million (23.7%), and above IDR 100 million (18.7%). While 73.2% of respondents held a Tax Identification Number (NPWP), only 51.5% reported filing tax returns regularly—revealing a substantial gap between formal and material compliance that constitutes a central concern of this study.

#### **b. Outer Model Evaluation (Measurement Model)**

##### **1) Convergent Validity and Reliability**

The measurement model evaluation results presented in Table 2 demonstrate that all indicators exhibit outer loadings above 0.708, confirming that each indicator explains more than 50% of its construct's variance (Hair et al., 2021). Average Variance Extracted (AVE) values for all constructs exceed the 0.50 threshold, establishing adequate convergent validity. Both Cronbach's Alpha and Composite Reliability values surpass the 0.70 minimum, confirming satisfactory reliability. All Variance Inflation Factor (VIF) values remain below 3.3, ruling out multicollinearity concerns at both the indicator and construct levels (Kock, 2015).

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**Table 2. Measurement Model Evaluation Results**

Construct / Indicator	Loading	Cronbach's $\alpha$	CR	AVE	VIF
<b>Tax Awareness (X1)</b>		0.878	0.912	0.675	
TA1	0.834				1.924
TA2	0.847				2.138
TA3	0.812				1.856
TA4	0.798				1.789
TA5	0.821				1.967
<b>Perceived Equity (X2)</b>		0.901	0.924	0.669	
PE1	0.823				2.045
PE2	0.841				2.187
PE3	0.807				1.912
PE4	0.819				1.978
PE5	0.796				1.834
PE6	0.828				2.067
<b>PPN PMSE Policy (M)</b>		0.869	0.905	0.657	
PM1	0.818				1.876
PM2	0.829				2.034
PM3	0.791				1.756
PM4	0.814				1.923
PM5	0.806				1.889
<b>Tax Compliance (Y)</b>		0.905	0.927	0.681	
TC1	0.841				2.189
TC2	0.852				2.312
TC3	0.823				2.045
TC4	0.807				1.923
TC5	0.819				2.078
TC6	0.813				1.956

Source: Primary data processed with SmartPLS 4.0 (2025)

Note: CR = Composite Reliability; AVE = Average Variance Extracted; VIF = Variance Inflation Factor

## 2) Discriminant Validity

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT) criterion as recommended by Henseler et al. (2015). All HTMT values presented in Table 3 fall below the conservative 0.90 threshold, confirming that each construct is empirically distinct from all others.

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**Table 3. Heterotrait-Monotrait Ratio (HTMT)**

	TA	PE	PM	TC
Tax Awareness (TA)	—			
Perceived Equity (PE)	0.587	—		
PPN PMSE Policy (PM)	0.534	0.467	—	
Tax Compliance (TC)	0.712	0.654	0.578	—

Source: Primary data processed with SmartPLS 4.0 (2025)

**4.3 Inner Model Evaluation (Structural Model)**

The structural model yields an R<sup>2</sup> value of 0.523 (moderate-to-substantial) for the tax compliance variable, indicating that tax awareness, perceived equity, PPN PMSE collection policy, and their interaction effects collectively explain 52.3% of the variance in digital economy tax compliance. The Q<sup>2</sup> predict value of 0.347 (> 0) confirms adequate predictive relevance (Shmueli et al., 2019). Hypothesis testing results using bootstrapping with 5,000 subsamples are presented in Table 4.

**Table 4. Hypothesis Testing Results (Bootstrapping 5,000 Subsamples)**

Hypothesis / Path	$\beta$	SE	t-value	p-value	f <sup>2</sup>	Decision
H1: TA → TC	0.412	0.056	7.357	0.000	0.224	Supported
H2: PE → TC	0.318	0.059	5.390	0.000	0.138	Supported
H3: TA×PM → TC	0.147	0.051	2.882	0.004	0.036	Supported
H4: PE×PM → TC	0.063	0.054	1.167	0.243	0.006	Not Supported
PM → TC (control)	0.156	0.053	2.943	0.003	0.041	—

Source: Primary data processed with SmartPLS 4.0 (2025)

Note: R<sup>2</sup> = 0.523; Q<sup>2</sup> = 0.347; TA = Tax Awareness; PE = Perceived Equity; PM = PPN PMSE Policy; TC = Tax Compliance

**4. DISCUSSION**

**a. The Effect of Tax Awareness on Tax Compliance**

Tax awareness emerges as the strongest predictor of digital economy tax compliance in Batam ( $\beta = 0.412$ ;  $t = 7.357$ ;  $p < 0.001$ ) with a large effect size ( $f^2 = 0.224$ ). This finding is consistent with Fischer’s Tax Compliance Model (Fischer et al., 1992) and aligns with the empirical results of Palil et al. (2023) and Rahayu (2023). The substantial magnitude of this effect indicates that tax awareness constitutes the foundational pillar of compliance—without adequate understanding of tax obligations, any enforcement mechanism will prove insufficient. Within Batam’s specific context, tax awareness operates through context-specific mechanisms that warrant detailed examination. First, Batam’s FTZ status creates a profound tax ambiguity for digital economy actors. The VAT exemption for transactions within the FTZ versus the imposition of VAT for cross-zone transactions through marketplace platforms generates confusion about when and how VAT obligations apply. The finding that only 51.5% of respondents routinely file tax returns—despite 73.2% holding a tax identification number—confirms a substantial compliance gap that can be largely attributed to inadequate understanding of the specific digital taxation obligations within the FTZ context.

Second, the Coretax DJP implementation that commenced in 2025 has transformed the tax administration landscape for digital MSMEs. The Coretax system simplifies reporting through integrated monthly turnover recording and 0.5% final income tax payment features. However, transitioning from the legacy system (e-Form requiring Adobe PDF Reader 32-bit) to Coretax demands adaptation that is non-trivial for MSME operators with limited digital literacy. Tax awareness in this context transcends mere understanding of tax obligations—it encompasses the ability to navigate an evolving digital administration system. This extends Fischer et al.’s (1992) conceptualization of tax awareness by incorporating a digital tax literacy dimension that is critically relevant in the Coretax era.

Third, the magnitude of the tax awareness effect underscores the urgency of targeted tax education programs for digital economy actors in industrial zones. While OJK Riau Islands has initiated financial literacy programs for industrial estate workers in Batam (OJK Riau Islands, 2026), analogous programs for digital tax literacy remain conspicuously limited. This finding implies that investment in digital tax education would yield significant returns in the form of enhanced compliance, particularly if integrated with the Coretax platform's educational features.

### **b. The Effect of Perceived Equity on Tax Compliance**

Perceived equity exerts a positive and significant effect on tax compliance ( $\beta = 0.318$ ;  $t = 5.390$ ;  $p < 0.001$ ) with a medium effect size ( $f^2 = 0.138$ ). This finding is consistent with Equity Theory (Adams, 1965), the Slippery Slope Framework (Kirchler et al., 2008), and the empirical results of Wenzel (2003) and Faizal et al. (2023). Perceived equity ranks as the second-strongest predictor after tax awareness, confirming that perceptions of fairness are not merely a supplementary variable but a substantive determinant of voluntary compliance. In the Batam context, perceived equity confronts structurally specific challenges. Descriptive analysis reveals that the lowest-scoring indicators were fairness of treatment between FTZ-based and non-FTZ sellers (mean = 2.87; SD = 1.12) and equality of burden between digital and conventional businesses (mean = 3.04; SD = 1.08). Digital economy actors in Batam perceive that the digital traceability of their transactions renders them more intensively targeted for tax surveillance compared to conventional businesses whose transactions are more difficult to track. This perception of horizontal inequity is consistent with Niu's (2022) findings regarding surveillance asymmetry in digital economy taxation.

Furthermore, digital operators based within the FTZ who sell products nationally through marketplace platforms face a distinctive equity dilemma: they benefit from VAT exemption on inputs (goods entering the FTZ) but must collect VAT when outputs are sold to consumers outside the FTZ via digital platforms. This complexity generates a perception that the tax system was not designed with the unique business model of FTZ-based digital commerce in mind. This finding extends the perceived equity literature from Gerbing (1988) and Gilligan and Richardson (2005) by identifying a novel dimension—spatial equity—that is specifically relevant in free trade zone taxation contexts where differential tax regimes coexist within a single economic ecosystem. The smaller magnitude of perceived equity relative to tax awareness ( $\beta = 0.318$  vs. 0.412) carries important policy implications. It suggests that in the digital tax compliance context in Batam, cognitive factors (knowledge and awareness) are more dominant than evaluative factors (fairness perceptions). However, the difference in magnitude is not dramatic, indicating that both factors are complementary and compliance-enhancing policies cannot afford to neglect the equity dimension.

### **c. The Asymmetric Moderating Role of PPN PMSE Collection Policy**

The most theoretically significant finding of this study is the asymmetric moderation effect of the PPN PMSE collection policy. This policy significantly strengthens the effect of tax awareness on tax compliance ( $\beta = 0.147$ ;  $t = 2.882$ ;  $p = 0.004$ ) but fails to moderate the effect of perceived equity ( $\beta = 0.063$ ;  $t = 1.167$ ;  $p = 0.243$ ). The effectiveness of moderation on tax awareness can be explained through the integration of Nudge Theory and the Slippery Slope Framework. From the nudge perspective, the PPN PMSE collection policy functions as a salience intervention—making tax obligations visible at each platform transaction. For digital actors who already possess high tax awareness, the presence of automatic collection mechanisms provides friction reduction that strengthens the translation of compliance intention into actual compliance behavior. In Slippery Slope terminology, this policy creates synergy between trust (shaped by awareness) and power (represented by the collection mechanism), producing quasi-voluntary compliance that is more robust than either voluntary or enforced compliance in isolation. This finding is consistent with Kleven et al. (2011), who demonstrated that third-party reporting significantly increases compliance, and extends their findings by showing that this increase is complementary to—rather than substitutive of—awareness.

Conversely, the inability of the PPN PMSE collection policy to moderate the perceived equity effect exposes a fundamental limitation of withholding mechanisms as instruments of justice. Platform-based VAT collection is procedural in nature—it changes the mechanism of how VAT is collected but does not alter the substance of who bears the tax burden or how tax benefits are distributed. Digital actors who perceive unfair treatment—whether due to heavier compliance burdens compared to conventional businesses, or inconsistent FTZ versus non-FTZ tax treatment—will not revise their equity perceptions merely because the collection mechanism has become automated. Within Tyler's (2006) framework of procedural justice, procedural

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fairness (which is improved by automatic collection mechanisms) matters, but it cannot fully compensate for perceived distributive injustice that is structural in character. This asymmetry finding carries substantial theoretical and practical implications. Theoretically, it demonstrates that technology-based enforcement mechanisms (such as automatic platform collection) have bounded effectiveness—they are effective as complements to cognitive factors (awareness) but cannot substitute for evaluative factors (perceived equity). This enriches the Slippery Slope Framework by showing that the power of authorities has conditional effects depending on the type of factor being moderated: power enhances the behavioral translation of knowledge-based compliance motivation but is inert against justice-based compliance resistance. Practically, this finding counsels DJP and policymakers against relying solely on PMSE VAT collector appointments to increase compliance—parallel efforts to improve perceived equity through substantive policy reform, not merely administrative mechanism reform, are essential.

## 5. CONCLUSIONS AND IMPLICATIONS

### a. Conclusions

This study yields four principal findings. First, tax awareness has a positive and significant effect on tax compliance among digital economy actors in Batam, representing the strongest predictor in the model and confirming that tax awareness constitutes an irreplaceable foundation of compliance. Second, perceived equity positively and significantly affects tax compliance, demonstrating that perceptions of tax system fairness are a substantive determinant of voluntary compliance in the FTZ digital taxation context. Third, the PPN PMSE collection policy positively moderates the tax awareness–compliance relationship, confirming that platform-based collection functions as a behavioral nudge that amplifies the effect of tax awareness. Fourth, the PPN PMSE collection policy does not significantly moderate the perceived equity–compliance relationship, revealing the structural limitation of withholding mechanisms in addressing justice-based compliance resistance.

### b. Theoretical Contributions

This study advances digital taxation literature in three respects. First, it extends the Slippery Slope Framework (Kirchler et al., 2008) by demonstrating that the power of authorities effect (through PPN PMSE collection policy) is asymmetric—complementary to cognitive factors (awareness) yet independent of evaluative factors (equity). This conditional moderation enriches the framework by specifying the boundary conditions under which enforcement power enhances or fails to enhance compliance. Second, the study integrates Nudge Theory into the digital taxation context of a developing country's free trade zone, demonstrating both the effectiveness and the limitations of salience nudges in shaping tax compliance. Third, the identification of the spatial equity dimension—fairness of taxation across zones (FTZ vs. non-FTZ)—enriches Gerbing's (1988) conceptualization of perceived equity for free trade zone contexts where differential tax regimes coexist.

### c. Policy Implications

For the Directorate General of Taxes, these findings imply the necessity of a dual-track strategy for improving digital economy tax compliance in FTZ areas. The first track targets tax awareness enhancement through: (a) digital tax education programs integrated with Coretax features, such as interactive tutorials and MSME tax guidance chatbots; (b) collaboration with marketplace platforms (Shopee, Tokopedia, TikTok Shop) to embed tax information within seller dashboards; (c) partnerships with Batam's digital MSME communities to disseminate understanding of the tax-exempt turnover threshold (IDR 500 million), the 0.5% final income tax rate, and cross-zone VAT mechanisms.

The second track targets perceived equity improvement through substantive policy reform: (a) simplification and harmonization of VAT treatment for digital transactions originating from FTZ areas; (b) enhanced transparency in tax revenue utilization through public dashboards showing tax allocation for Batam's infrastructure and public services; (c) proportional adjustment of administrative compliance burdens between digital and conventional businesses, recognizing that digital actors' transaction records are already automatically captured. For marketplace and digital platform operators, the moderation findings provide justification for developing more comprehensive tax compliance assistance features, including automatic tax calculators, filing reminders, and direct integration with the Coretax system.

#### d. Limitations and Future Research Directions

This study's limitations include: (1) the cross-sectional design precludes temporal causal inference; future research could employ panel data or quasi-experimental designs comparing pre- and post-PMSE VAT collector appointment periods; (2) tax compliance measurement through self-report is susceptible to social desirability bias; leveraging DJP administrative data (actual filing and payment records) would enhance measurement validity; (3) the sample is limited to Batam, whose FTZ characteristics may not generalize; replication in cities with different regulatory environments is needed; (4) future studies could integrate digital tax literacy, trust in digital government, and social norms as additional mediators or moderators for a more comprehensive model; (5) comparative studies between FTZ-based and non-FTZ digital economy actors within Indonesia would help disentangle the spatial equity effect identified in this study from general perceived equity effects.

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