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The effect of tax understanding and individual taxpayer education level on msme compliance in npwp ownership: A survey of MSMEs in Mapanget District, Manado City

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ABSTRACT
MSME compliance in Taxpayer Identification Number (NPWP) ownership remains low in Mapanget District, Manado City, and is thought to depend on taxpayers' tax understanding and educational background. This study examines the effect of tax understanding (X1) and individual taxpayer education level (X2) on MSME compliance in NPWP ownership (Y) using a quantitative survey of 95 MSME actors selected through purposive sampling. Data were analyzed with multiple linear regression in SPSS after instrument validity/reliability and classical assumption tests. Tax understanding had a positive and significant effect on compliance (B=0.959; t=28.960; Sig.<0.001), while education level had no significant effect (B=0.268; t=1.089; Sig.=0.279). The model was significant overall (F(2,92)=790.50; Sig.<0.001) and explained 94.4% of the variance (Adjusted R2=0.944). Given this unusually large effect size, a Harman's single-factor test indicated that common-method bias is unlikely to fully explain the result (single-factor variance=41.7%). These findings suggest that tax understanding, not formal education, is the dominant driver of formal MSME tax compliance, implying that tax authorities and MSME support agencies should prioritize understanding-based over credential-based compliance interventions.

Keywords: tax understanding; education level; MSME compliance; taxpayer identification number (NPWP)
JEL Classification: H25; H26

1. Introduction

Tax revenue is a key source of state funding for government administration and national development, and depends heavily on taxpayer compliance. Indonesia's tax ratio reached only 10.21% of GDP in 2023 (Ministry of Finance of the Republic of Indonesia, 2024), well below the 19.8% Asia-Pacific average reported by the OECD (2023). The government therefore continues to expand the tax base and strengthen tax administration.

MSMEs have great potential to expand the tax base given their dominant numbers and contribution to employment and GDP. However, this economic contribution has not been matched by a comparable tax contribution, indicating that MSME tax compliance still needs improvement.

Tax compliance covers not only tax payment but also formal compliance, including ownership of a Taxpayer Identification Number (NPWP), the official taxpayer identity used for registration and supervision of tax obligations. NPWP ownership is nonetheless still low among MSME actors, partly because of negative perceptions of taxation and the perceived complexity of registration procedures, which reduce their participation in the formal tax system (Situmorang, 2025).

This study is grounded in two theoretical perspectives. The Theory of Planned Behavior (TPB) holds that behavioral intention is shaped by attitude, subjective norms, and perceived behavioral control (Ajzen, 1991); tax understanding strengthens both a favorable attitude toward compliance and perceived control over the NPWP registration process. Human Capital Theory (Becker, 1964) frames formal education as an investment that increases cognitive capacity to acquire and apply regulatory information, including tax procedures. These perspectives are supported by the international literature: the slippery-slope framework (Kirchler, Hoelzl, & Wahl, 2008) similarly identifies knowledge and perceived capability as antecedents of compliance, Alm (2019) confirms taxpayer knowledge as a consistent correlate of compliance, and Musimenta, Nkundabanyanga, Muhwezi, Akankunda, and Nalukenge (2017) find comparable effects among SMEs in Uganda.

Tax understanding, taxpayers' ability to know and apply tax rules, procedures, and benefits, is one key factor shaping MSME compliance in NPWP ownership. Taxpayers with better tax understanding tend to be more aware of their obligations, including NPWP ownership (Aprilia and Fauzan, 2023), while low tax knowledge is linked to low NPWP ownership among MSME actors (Novryzal et al., 2020).

Education level, related to a person's capacity to obtain and process information, is a second potential factor. Individual taxpayers with higher education are expected to better understand tax provisions and procedures. Audina et al. (2023) and Meidiyustiani et al. (2022) found a positive effect of education level on compliance, whereas Yulia et al. (2020) found no effect, an inconsistency that warrants further examination, particularly for formal compliance such as NPWP ownership.

Although prior studies have examined tax understanding and education level in relation to taxpayer compliance, research specifically on MSME actors in Mapanget District remains limited. Aprilia and Fauzan (2023) studied a semi-urban commercial center in Pati Regency; Audina et al. (2023) did not isolate a single regional locus and combined tax understanding, education, and income level in one model; and Yulia et al. (2020) surveyed MSMEs in Padang City, a provincial capital with a different demographic and business profile. Because regional social and economic characteristics differ, these findings do not necessarily generalize to Mapanget District, an area with rapid MSME growth and diverse educational backgrounds.

An initial survey of 30 MSME actors in Mapanget District (November 2025) found that 21 (70%) did not have an NPWP, confirming that formal NPWP compliance remains low in this area.

Given this gap in NPWP ownership and the variation in tax understanding and educational background among MSME actors, this study examines the effect of tax understanding and individual taxpayer education level on MSME compliance in NPWP ownership in Mapanget District, contributing by distinguishing the role of applied tax understanding from formal educational attainment in this specific administrative context.

This study contributes by distinguishing the role of applied tax understanding from formal educational attainment in explaining MSME compliance in NPWP ownership within the specific administrative context of Mapanget District.

2. Literature review

Tax Understanding and MSME Compliance

Tax understanding is taxpayers' knowledge and ability to understand the rules, rights, obligations, and procedures of taxation (Resmi, 2019; Mardiasmo, 2023). Within the Theory of Planned Behavior (Ajzen, 1991), tax understanding operates mainly through perceived behavioral control: taxpayers who understand NPWP procedures see registration as more attainable, increasing their intention to comply.

Empirically, tax knowledge has been shown to affect MSME compliance in Manado City (Soda et al., 2021) and NPWP ownership specifically (Kurniasi and Halimatusyadiah, 2018). Internationally, Kirchler et al. (2008) and Alm (2019) similarly identify taxpayer knowledge as a consistent driver of voluntary compliance. Based on this reasoning, the following hypothesis is proposed:

H1: Tax Understanding has a positive and significant effect on MSME Compliance in NPWP ownership.

Individual Taxpayer Education Level and MSME Compliance

Education level reflects a person's capacity to receive, understand, and process information, developed through knowledge, attitudes, and skills (Hidayat & Abdillah, 2019). Human Capital Theory (Becker, 1964) frames formal education as an investment that should ease the acquisition of regulatory information, including tax rules.

Empirical evidence is mixed: Audina et al. (2023) and Meidiyustiani et al. (2022) report a positive effect of education level on compliance, while Yulia et al. (2020) and Kirchler et al. (2008) find the relationship weaker and less consistent than knowledge-based predictors, suggesting the human-capital pathway may operate mainly through applied tax understanding rather than educational attainment itself. Based on this reasoning, the following hypothesis is proposed:

H2: Individual taxpayer education level has a positive and significant effect on MSME compliance in NPWP ownership.

MSME Compliance in NPWP ownership

Taxpayer compliance is the fulfillment of tax obligations in accordance with applicable provisions (Resmi, 2019), comprising formal compliance (e.g., NPWP ownership, timely tax return reporting, proper bookkeeping) and material compliance (paying the correct tax amount). This study focuses on formal compliance, specifically MSME compliance in NPWP ownership.

MSME criteria (regulatory background)

MSMEs are productive businesses meeting criteria set out in Law of the Republic of Indonesia Number 20 of 2008 and the capital thresholds in Government Regulation Number 7 of 2021. MSMEs are the object of this study because their NPWP-ownership compliance is part of formal taxpayer compliance; sample-eligibility criteria derived from this regulatory background are detailed in the Research Method section.

Conceptual framework

Based on the theoretical grounding and hypotheses above, the conceptual framework positions tax understanding (X1) and individual taxpayer education level (X2) as predictors of MSME compliance in NPWP ownership (Y), as illustrated in Figure 1.

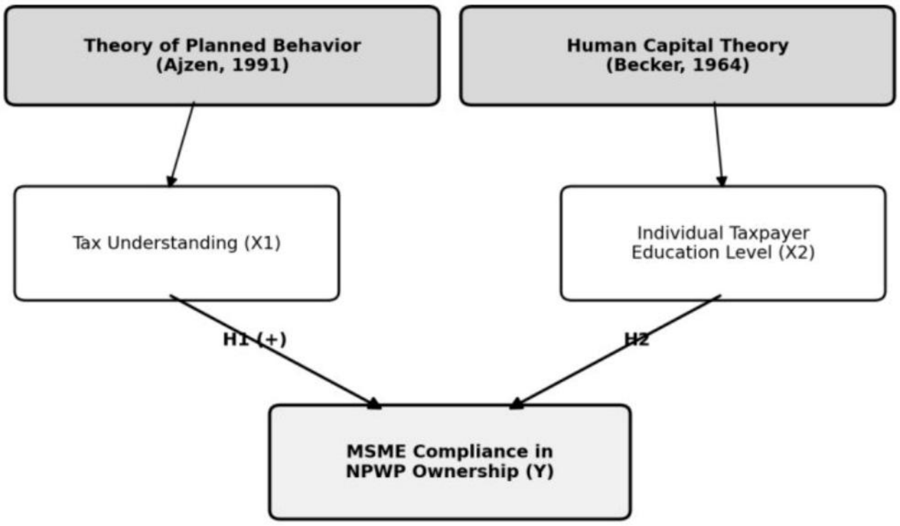

Figure 1. Conceptual framework

3. Research method

This study uses a quantitative survey method, distributing questionnaires to MSME actors in Mapanget District, Manado City, to examine the effect of tax understanding and individual taxpayer education level on MSME compliance in NPWP ownership.

The population comprises all 1,761 MSME actors in Mapanget District (Manado City Cooperatives and MSMEs Office). Samples were selected via purposive sampling (Sugiyono, 2019) based on three criteria: (a) business located in Mapanget District, (b) operating for at least one year, and (c) willingness to complete the questionnaire.

Table 1. Number of sub-district MSMEs Mapanget

Sub-district	Village	Quantity
	Bengkol	43
	Buha	457
	Kairagi Satu	120
	Kairagi Dua	226
Mapanget	Kima Atas	4
	Lapangan	129
	Mapanget Barat	83
	Paniki Bawah	249
	Paniki Satu	140
	Paniki Dua	310
Total		**1.761**

Source: Manado City Cooperatives and MSMEs Office, 2025

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Using the Slovin formula with a 10% error rate, the required sample size was 94.62, rounded up to 95 respondents, all of whom were retained per the study's eligibility criteria. The sample included six respondents under 18 (two aged 15–16, four aged 17) who were retained because they actively run their businesses; this is noted as a limitation, since respondents under 18 do not meet the legal age requirement to independently obtain an NPWP.

Table 2. Sample selection process

Sample Selection Process	Quantity
MSME population in Mapanget District	1.761
Minimum sample based on the Slovin formula	95
Questionnaires distributed	95
Questionnaires returned	95
Questionnaires eligible for analysis	95
Final Sample	95

Source: Research data processed by the authors, 2026

This study uses quantitative data from primary sources (questionnaires) and secondary sources (MSME counts from the Manado City Cooperatives and MSMEs Office). The closed-ended tax-understanding and compliance items were adapted from the validated instrument of Aprilia and Fauzan (2023), with minor wording adjustments for the local NPWP registration procedure, and reviewed by the research team for face validity and clarity.

The study has two independent variables and one dependent variable. Tax understanding (X1) captures MSME actors' knowledge of NPWP function, benefits, ownership provisions, administrative requirements, online registration, and the NIK-as-NPWP policy. Individual taxpayer education level (X2) is measured on a six-category ordinal scale (1 = elementary school to 6 = master's degree). MSME compliance in NPWP ownership (Y) is the willingness and action of MSME actors to fulfill NPWP-ownership provisions as a form of formal tax compliance.

Tax understanding and compliance were measured with a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree) to avoid neutral responses, while education level was measured on an ordinal scale reflecting increasing levels of education. Consistent with common practice in behavioral survey research, this ordinal variable was entered directly into the OLS regression as an approximately interval-scaled predictor; such treatment introduces only minor distortions in large samples (Norman, 2010), though it is a modeling simplification revisited in the Discussion.

Data were analyzed with SPSS through instrument-quality tests (validity, reliability), classical assumption tests (normality, multicollinearity, heteroscedasticity), and multiple linear regression, followed by the F-test, t-test, and coefficient of determination (R2). Given the high R2, a Harman's single-factor test was also conducted to assess potential common-method bias.

4. Result and discussion

Respondent demographic profile

The demographic characteristics of the 95 respondents are summarized in Table 3.

Table 3. Respondent demographic profile (n=95)

Characteristic	Category	n	%
Gender	Male	20	21.1%
	Female	75	78.9%
Age	<20 years	7	7.4%
	20-25 years	58	61.1%
	26-30 years	10	10.5%
	>30 years	20	21.1%
Education Level	Elementary School	0	0%
	Junior high school	4	4.2%
	Senior high school	52	54.7%
	Diploma	1	1.1%
	Bachelor’s degree	37	38.9%
	Master's degree	1	1.1%
Bussiness Durration	1-3 years	68	71.6%
	4-6 years	23	24.2%
	>6 years	4	4.2%
NPWP ownership	Yes	44	46.3%
	No	51	53.7%

Descriptive statistics

Table 4. Descriptive statistics

Variable	N	Min.	Max.	Mean	Std. Deviation
Tax Understanding (X1)	95	14	38	26.67	7.829
Education Level (X2)	95	2	6	3.78	1.054
MSME Compliance in NPWP Ownership (Y)	95	14	37	26.73	7.923

Instrument quality tests

Validity was assessed by comparing each item's correlation coefficient (r-count) with the r-table value; an item is valid if r-count > r-table (Ghozali, 2021).

Table 5. Validity and reliability test results

Variable	Item	r-count / Cronbach's Alpha	r-table	Remarks
Tax Understanding (X1)	X1.1	0.853	0.202	Valid
Tax Understanding (X1)	X1.2	0.834	0.202	Valid
Tax Understanding (X1)	X1.3	0.805	0.202	Valid
Tax Understanding (X1)	X1.4	0.710	0.202	Valid
Tax Understanding (X1)	X1.5	0.842	0.202	Valid
Tax Understanding (X1)	X1.6	0.790	0.202	Valid
Tax Understanding (X1)	X1.7	0.717	0.202	Valid
Tax Understanding (X1)	X1.8	0.805	0.202	Valid
Tax Understanding (X1)	X1.9	0.759	0.202	Valid
Tax Understanding (X1)	X1.10	0.818	0.202	Valid
Tax Understanding (X1)	**Cronbach's Alpha**	**0.935**	–	**Reliable**
MSME Compliance in NPWP Ownership (Y)	Y.1	0.764	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.2	0.794	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.3	0.776	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.4	0.842	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.5	0.792	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.6	0.837	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.7	0.818	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.8	0.785	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.9	0.798	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	Y.10	0.842	0.202	Valid
MSME Compliance in NPWP Ownership (Y)	**Cronbach's Alpha**	**0.939**	–	**Reliable**

As shown in Table 5, all indicator items for Tax Understanding (X1) and MSME Compliance in NPWP Ownership (Y) produced r-count values greater than the r-table (0.202), confirming that every item is valid. The Cronbach's Alpha for both variables also exceeded the 0.60 threshold (0.935 and 0.939, respectively), indicating that the instrument is reliable (Ghozali, 2021).

Based on the results, all statement items on the variables of Tax Understanding (X1) and MSME Compliance in NPWP Ownership (Y) have a value of r calculated > rtable (0.202), which means that all statement items are declared valid and can be used in measuring research variables.

Reliability tests are carried out to ensure that the research tool is consistent in measuring variables. The reliability test is used by looking at Cronbach's Alpha values. The instrument is determined to be reliable if the Cronbach's Alpha > 0.60, which means that the questionnaire has a good level of consistency (Ghozali, 2021). Based on the results, the Cronbach's Alpha value for each variable on the research instrument was greater than 0.60, indicating a good level of consistency.

Classical assumption tests

Classical assumption tests were conducted to ensure that the regression model met the requirements of normality and freedom from multicollinearity. Normality was assessed using the Normal Probability Plot (P-P Plot) and the Kolmogorov-Smirnov statistical test, with residuals considered normally distributed when the significance value is > 0.05. Multicollinearity was assessed using the Variance Inflation Factor (VIF) and Tolerance values, with the model considered free of multicollinearity when VIF < 10 and Tolerance > 0.10 (Ghozali, 2021).

Table 6. Classical assumption test results (normality and multicollinearity)

Test	Variable / Model	Statistic	Criterion	Result
Normality (Kolmogorov–Smirnov)	Unstandardized Residual	Sig. = 0.142	Sig. > 0.05	Normally distributed
Multicollinearity	Tax Understanding (X1)	Tolerance = 0.559; VIF = 1.790	Tolerance > 0.10; VIF < 10	No multicollinearity
Multicollinearity	Education Level of OP Taxpayer (X2)	Tolerance = 0.559; VIF = 1.790	Tolerance > 0.10; VIF < 10	No multicollinearity

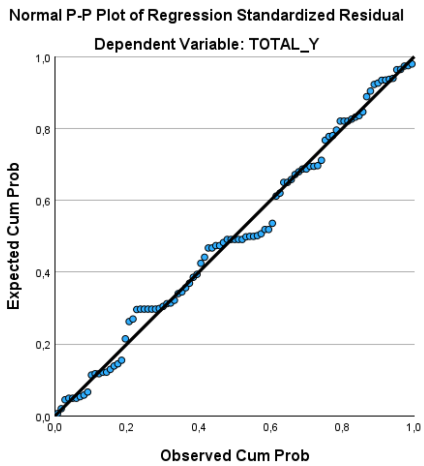

Figure 2. Normal probability plot (P-P Plot)

The P-P Plot shows the dots spread around the diagonal line, consistent with the Kolmogorov-Smirnov significance of 0.142 (>0.05), confirming that the regression residuals are normally distributed.

As shown in Table 6, the Kolmogorov-Smirnov significance value (0.142)

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exceeds 0.05, so the regression residuals are normally distributed, consistent with the P-P Plot in Figure 2. The Tolerance values for Tax Understanding (X1) and Education Level (X2) are both above 0.10, and their VIF values are both below 10, indicating that the regression model is free of multicollinearity.

Heteroscedasticity was assessed via a scatterplot of residuals (Ghozali, 2021). The scatterplot shows a random distribution of points with no discernible pattern, indicating no heteroscedasticity in the model.

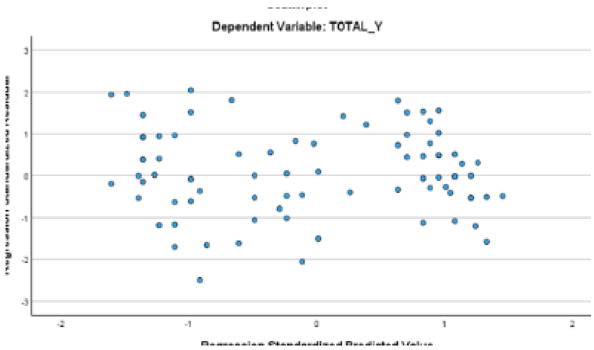

Figure 3. Heteroscedasticity test scatterplot

Multiple linear regression analysis

The results of the multiple linear regression, combining unstandardized coefficients and t-test results, are presented in Table 7.

Table 7. Regression analysis summary (coefficients, model fit, and F-Test)

Variable	B	Std. Error	t	Sig.
(Constant)	0.120	0.769	0.157	0.876
Tax Understanding (X1)	0.959	0.033	28.960	<0.001
Education Level of OP Taxpayer (X2)	0.268	0.246	1.089	0.279
Model Fit	R = 0.972; R^2 = 0.945; Adjusted R^2 = 0.944; SE of Estimate = 1.879			
F-test (ANOVA)	F(2, 92) = 790.50; Sig. < 0.001			

Dependent Variable: MSME Compliance in NPWP Ownership (Y).

The resulting regression equation is $Y = 0.120 + 0.959X1 + 0.268X2$. The constant (0.120) indicates the predicted compliance level when X1 and X2 are zero. The positive coefficients show that a one-unit increase in tax understanding raises compliance by 0.959 units (holding X2 constant), and a one-unit increase in education level raises compliance by 0.268 units (holding X1 constant).

Hypothesis testing

The t-test results in Table 7 show that Tax Understanding (X1) has a significance value of <0.001 (<0.05), so H1 is accepted: tax understanding significantly affects MSME compliance in NPWP

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ownership. Education Level (X2) has a significance value of 0.279 (>0.05), so H2 is rejected: education level has no significant effect on compliance.

The overall significance and explanatory power of the model are also reported in Table 7: an F-statistic of 790.50 (Sig. < 0.001) confirms the model is statistically significant overall, and the Adjusted R2 of 0.944 indicates that tax understanding and education level jointly explain 94.4% of the variance in MSME compliance, with the remaining 5.6% attributable to other factors such as taxpayer awareness, tax socialization, fiscal service quality, and administrative requirements (e.g., for business loan applications requiring NPWP).

Assessment of the large effect size and common-method bias

The Adjusted R2 (0.944) and the coefficient for tax understanding are unusually large for a two-predictor behavioral survey model based on self-reported Likert data, magnitudes more often linked to common-method bias or conceptual overlap between predictor and outcome items than to a genuine effect of this size in the wider literature (Alm, 2019; Kirchler et al., 2008). A Harman's single-factor test, entering all Tax Understanding and Compliance items into one unrotated factor analysis, found the first factor explained 41.7% of variance, below the 50% threshold for severe common-method bias. Nevertheless, several Tax Understanding items are conceptually close to several Compliance items, which may have inflated the observed association. This item overlap, rather than a claim that tax understanding deterministically produces compliance, is offered as the most plausible explanation for the large effect, and the coefficient's size should be interpreted with appropriate caution.

Discussion

Tax understanding (X1) has a positive and significant effect on MSME compliance in NPWP ownership (Y), so H1 is accepted: the higher MSME actors' tax understanding, the higher their NPWP-ownership compliance. This indicates that good tax understanding makes MSME actors aware of NPWP's importance, their obligations, and its administrative and legal benefits. Consistent with the Theory of Planned Behavior (Ajzen, 1991), tax understanding appears to operate mainly by strengthening perceived behavioral control over the NPWP registration process, making it feel more attainable.

These results align with Meidiyustiani et al. (2022), Mintje (2016), and Musimenta et al. (2017), who similarly report that tax knowledge significantly predicts MSME/SME compliance, including in a comparable developing-country setting (Uganda), and with Resmi (2019), who links good tax understanding to higher compliance. However, the coefficient magnitude observed here is considerably larger than typically reported in this literature and should be interpreted with the common-method-bias and item-overlap caveats noted above rather than as evidence of a uniquely powerful effect. These findings reinforce that improving MSME actors' tax understanding is an effective way to increase NPWP-ownership compliance, while also underscoring the need for future multi-method or multi-source studies to more cleanly separate the constructs of tax understanding and compliance.

Education level (X2) has no significant effect on MSME compliance in NPWP ownership, so H2 is rejected: formal education alone does not directly drive compliance. Although Human Capital Theory (Becker, 1964) predicts that education should ease the acquisition of regulatory information, and consistent with Kirchler et al. (2008), the education-compliance relationship here is weaker and less consistent than the knowledge-compliance relationship, suggesting that education's effect on compliance operates mainly indirectly, through applied tax understanding, rather than directly.

This suggests that NPWP-ownership compliance depends less on formal educational background than on specific tax understanding: highly educated MSME owners are not necessarily more compliant if they lack sufficient understanding of NPWP's functions and obligations, while less-educated owners can still be compliant if they possess sound tax knowledge.

This is consistent with Anggraeni and Ramayanti (2023), who likewise found no significant effect of education level on MSME compliance, confirming that education is not the dominant driver of compliance. Efforts to increase compliance are therefore likely more effective when directed at practical tax education and socialization rather than at formal educational credentials.

5. Conclusion

This study confirms that tax understanding has a positive and significant effect on MSME compliance in NPWP ownership in Mapanget District, whereas individual taxpayer education level has no significant effect, indicating that applied tax knowledge, rather than formal educational attainment, is the dominant driver of formal MSME tax compliance in this setting. These findings extend the Theory of Planned Behavior and Human Capital Theory to the context of formal MSME tax compliance: the strong tax-understanding pathway supports the perceived-behavioral-control mechanism emphasized by TPB (Ajzen, 1991) and the slippery-slope framework (Kirchler et al., 2008), while the non-significant education pathway suggests that Human Capital Theory's prediction of a direct education-compliance link (Becker, 1964) is mediated by applied tax understanding rather than exerted directly. Practically, these results suggest that the Directorate General of Taxes (DJP) and the Manado City Cooperatives and MSMEs Office would achieve more cost-effective compliance outcomes by prioritizing practical, understanding-based interventions, such as simplified NPWP registration guidance and targeted tax literacy workshops, over interventions that rely on formal education as a targeting criterion.

This study is nonetheless subject to several limitations that suggest directions for future research. The inclusion of six underage respondents and the unusually large effect size for tax understanding, although partly examined through a Harman's single-factor test, warrant caution in interpreting the findings; future studies should incorporate minimum-age screening and multi-source or multi-method designs to strengthen construct validity. In addition, because this study is limited to a single district with a cross-sectional design, its causal inference and generalizability are constrained; future research is therefore encouraged to replicate this model across multiple districts or cities, incorporate additional factors such as taxpayer awareness, tax socialization, and fiscal service quality, and adopt longitudinal or quasi-experimental designs to strengthen causal claims about the tax understanding-compliance relationship.

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