The Effectiveness of the Re-Marking Service of Measuring Instruments, Measures, Weighs, and Equipment By the Technical Implementation Unit of the Legal Metrology Region in Realizing Measurement Order and Increasing Consumer Trust in Aceh Besar

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ABSTRACT

This study aims to analyze the effect of the effectiveness of the re-marking service of the Measuring Instrument, Measure, Weigh on consumer confidence and the smooth running of trade activities, both directly and through mediation, as well as to test the role of consumer metrology literacy as a moderation variable. This research was carried out at the Lambaro Traditional Market, Aceh Besar, with a merchant population of 984 people who use measuring instruments, measurements, weights, and equipment. The number of samples was determined using the Slovin formula with a margin of error of 8%, so that 135 respondents were obtained. The data was analyzed using the Structural Equation Modeling method based on Partial Least Squares (SEM-PLS) through the Smart PLS application. The results showed that the effectiveness of the re-marking service of the Measuring Instrument, Measure, Weigh had a significant effect on consumer confidence ($\beta = 0.754$; $p < 0.001$), but did not have a direct effect on the smooth running of trading activities ($\beta = 0.107$; $p = 0.219$). On the other hand, consumer confidence was shown to have a significant effect on the smooth running of trading activities ($\beta = 0.499$; $p < 0.001$) and mediated a full relationship between the effectiveness of re-marking services and smooth trading ($\beta = 0.376$; $p < 0.001$). In addition, consumer metrology literacy strengthened the relationship between consumer confidence and smooth trading ($\beta = 0.097$; $p = 0.023$). This research provides a practical contribution for local governments, especially the Legal Metrology Regional Technical Implementation Unit, to improve the quality of re-marking services as an instrument for building public trust. For business actors, re-marking results are not only a legal obligation, but also a strategic means to improve the business image. This research is also useful for the community as a basis for improving metrology literacy as well as for academics as a reference for developing further research models in the field of trade and legal metrology.

Keywords: Service effectiveness, re-marking of measuring instruments, measurements, weighing, consumer confidence, smooth trade, metrology literacy.

INTRODUCTION

From a management perspective, the effectiveness of the re-marking service of Measuring Instruments, Measures, Weights, and Equipment by the Regional Technical Implementation Unit of Legal Metrology has direct implications for consumer confidence and the smooth running of trading activities. Efficient and accountable re-marking services ensure that the measuring tools used by traders and business actors in Aceh Besar provide accurate and standard results. This accuracy is a guarantee for consumers that they get goods or services according to the value paid. A report from the Ministry of Trade (2022) shows that areas with high levels of compliance with their Measuring Instruments, Measures, Weights, and Equipment tend to have lower rates of consumer disputes regarding measurements.

Limited resources, both in terms of infrastructure, equipment, and human resources in the Aceh Besar Legal Metrology Regional Technical Implementation Unit, can be a challenge in providing optimal services. The efficiency of the re-marking process, the range of services, as well as the level of socialization and education to business actors regarding the importance of re-marking of Measuring Instruments, Measures, Weights, and

Equipment are key factors that need to be analyzed from the perspective of operational and marketing management. Research by Kotler and Keller (2016) in the book *Marketing Management* emphasizing the importance of quality of effective service and communication in building and maintaining customer trust.

This research is important to understand in depth how the role of the Technical Implementation Unit of the Aceh Besar Legal Metrology Regional in carrying out the service function of re-marking measuring instruments, measures, weights, and equipment, and its impact on the level of consumer confidence and the smooth running of trade activities in the region. The results of this study are expected to contribute to the development of a more effective management strategy of the Legal Metrology Regional Technical Implementation Unit, as well as formulate policy recommendations that can improve consumer protection and promote a healthy trade climate in Aceh Besar. A study by Morgan and Hunt (1994) in the Journal of Marketing introduced the Relationship Commitment-Trust theory, which highlights the role of trust as the foundation of successful business relationships.

The benchmark of the quality of the role of the Legal Metrology Regional Technical Implementation Unit on consumer confidence and smooth trade in Aceh Besar in this study was reviewed from two indicators, namely: 1) The effectiveness of the service of re-marking measuring instruments, measures, weighings, and equipment: Measuring the quality, speed, and range of re-marking services of measuring instruments, measures, weights, and equipment to traders and business actors in traditional markets and other trade sectors in Aceh Besar. 2) The impact of re-marking services on consumer confidence and smooth trading: Analyzes how re-marking services, measuring instruments, weighs, and their equipment affect consumer perceptions of the accuracy of measurements in transactions and their impact on overall trading activities (Directorate of Metrology. 2023).

The scope of this research includes several aspects, including: 1) The authority and organizational structure of the Regional Technical Implementation Unit of Legal Metrology of Aceh Besar Regency in the implementation of legal metrology. 2) The process and procedure for the service of printing/re-marking measuring instruments, measurements, weighs, and their equipment carried out by the technical implementation unit of the Legal Metrology region. 3) Implementation of policies and programs related to the re-marking of measuring instruments, measures, weights, and equipment in increasing consumer confidence. 4) Challenges and obstacles faced by the Legal Metrology Regional Technical Implementation Unit in providing effective re-marking services. 5) The level of understanding and compliance of business actors in the traditional market and other trade sectors with the obligation to re-mark measuring instruments, measures, weights, and equipment.

A preliminary survey conducted by the author at the Lambaro Traditional Market, Aceh Besar in 2025 indicates that there are challenges in understanding legal metrology at the trader level. The majority of traders (11 out of 25 respondents) do not yet understand the function of legal metrology and assume it is related to weather forecasting. This lack of understanding has the potential to hinder the implementation of fair and transparent trading practices, which can ultimately harm consumers and damage the market's image. Data from the Central Statistics Agency of Aceh Province (2024) shows that the wholesale and retail trade sector is one of the largest contributors to the Gross Regional Domestic Product, which is 18.53%. This underscores the importance of maintaining trust in every transaction in this sector.

Based on the above background, to understand the phenomenon in depth, direct observation, interviews with several traders, and data analysis will be very helpful. To be able to design an effective strategy for the service of re-marking measuring instruments, measures, weights, and equipment, the author in this case proposes the title of the research "The Effectiveness of the Service of Re-marking Measuring Instruments, Measures, Weights, and Their Equipment by the Technical Implementation Unit of the Legal Metrology Region in Realizing Measurement Order and Increasing Consumer Confidence in Aceh Besar".

LITERATURE REVIEW

Effectiveness of Tera Service Repeat the measuring tool, measure, weigh, and equipment

The measure of how well the re-marking service achieves its purpose in ensuring the accuracy and correctness of the measurement results of measuring instruments, measures, weights, and equipment used in the community (Ministry of Trade of the Republic of Indonesia. 2022).

Efficiency, speed, and Accuracy of Tera Service Repeat by Technical Implementation Unit of Legal Metrology Region and the indicators are as follows:

1) Punctuality rateIn the implementation of the re-marking service
2) Process completion speed Re-marking measuring instruments, measures, weighs, and equipment
3) Conformity of results Re-marking with standard size Applicable
4) Availability and clarity of information related to procedures and service fees
5) The level of user satisfaction with the quality of service is remarkable.

Consumer Trust

Consumer trust is a complex psychological construct, reflecting consumer confidence in the reliability, integrity, and competence of an entity, be it a company, brand, or in this context, a measurement system used by business actors (Setiawan, A., & Wijayanti, A. 2018). Trust is an important cornerstone of any exchange transaction, reducing the perception of risk and uncertainty for consumers (Sari, R. D., & Permana, T. 2023). In the context of legal metrology, consumer confidence refers to the buyer's belief that the measuring instruments, measures, and weighs used by merchants have been verified for accuracy through a re-marking process, so that transactions are fair and in accordance with applicable standards.

indicators that can be used to build a questionnaire in this study, which is aimed at *business actors* to measure their perception of consumer confidence as a result of the re-marking of measuring instruments, measures, weights, and equipment (Directorate General of Consumer Protection and Commercial Order. 2023).

1) Consumer Confidence in the Accuracy of Re-Labeled Measuring Instruments
2) Frequency of Consumer Re-Enquiries Regarding the Accuracy of Measuring Instruments
3) The Impact of Rebranding on Business Image in the Eyes of Customers
4) The Effect of Re-Branded Stickers on Transaction Trust

Smooth Trading Activities

Smooth trading activities refer to conditions in which the process of buying and selling goods and services takes place efficiently, without significant obstacles related to measurement inaccuracies, consumer disputes regarding quantity, or distrust of the measuring instruments used (Lim, Yap, & Makkar, 2022). In the context of legal metrology, smooth trading is one of the indicators of the system's success in creating a fair, transparent, and trustworthy transaction environment, which ultimately facilitates economic growth and well-being (Huang, Chen, & Hsu, 2022).

indicators that can be used to build a questionnaire in this study, which is aimed at *business actors* to measure their perception of the smooth running of trade activities as a result of the legal metrology system and in particular the re-marking service of measuring instruments, measures, weights, and equipment (Kim, Lee, & Park, 2024).

1) Frequency of Consumer Complaints Related to Scales or Measuring Instruments
2) Frequency of Complaints Regarding Measurement Inaccuracy
3) Perception of Increased Business Revenue Since Following the Re-Branding
4) Perception of the Smoothness and Speed of Business Transactions

Consumer Metrology Literacy

Consumer metrology literacy refers to the level of knowledge and understanding of consumers regarding concepts, principles, and regulations related to measurement in trade transactions (Jalantina, & Minarsih, 2024). Consumers who have good metrological literacy will be able to understand their rights and obligations regarding measurements, recognize legitimate measuring instruments, interpret impression marks, and ultimately, make more informed purchasing decisions and are protected from harmful trading practices (Huang, Li, & Wu, 2022).

Indicators that can be used to build a questionnaire in this study, which is aimed directly at *user* to measure their level of legal metrology literacy (Ham, Lee, & Choi, 2021):

1) Understanding of Symbols or Marks
2) Understanding the Importance of Official Remarks
3) Ability to Distinguish Legal and Unauthorized Measuring Instruments
4) Receipt of Official Information on Metrology
5) Perception of Adequacy of Personal Metrology Literacy

RESEARCH METHODS

Types and Approaches of Research

This type of research is quantitative research with an analytical survey approach. This research is focused on analyzing the effectiveness of re-marking services of measuring instruments, measures, weights, and equipment, consumer confidence, smooth trading activities and Consumer Metrology Literacy as moderation variables. Sample of 135 traders, Types of data used primary and secondary, Data collection techniques including observation, interviews and questionnaire distribution. Data processing used SPSS and PLS (Partial Least Square) descriptive statistics, Descriptive statistics in this study were used to describe the characteristics of respondents. Meanwhile, PLS (Partial Least Square) is used to analyze the effectiveness of the service of re-marking measuring instruments, measures, weights, and equipment, consumer confidence, smooth trading activities, and Consumer Metrology Literacy as moderation variables.

The data analysis technique used in this study is quantitative data analysis. The results of the research obtained from the field were processed using statistical calculations using PLS (Partial Least Square). PLS is a Structural Equation Modeling (SEM) equation model with an approach based on variance or component-based structural equation modeling. According to the purpose of PLS-SEM is to develop a theory or build a theory (prediction orientation). PLS is used to explain whether there is a relationship between latent variables (prediction). PLS is a powerful analysis method because it does not assume flow data with a certain scale measurement, small sample size.

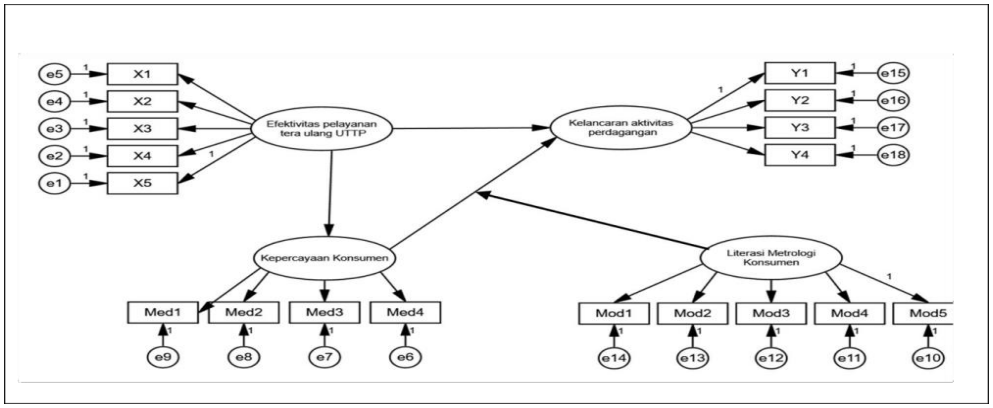

Figure 1. Flowchart

RESULTS AND DISCUSSION

Respondent Characteristics

The majority of respondents in this study were men, namely 78 people (57.78%), while female respondents amounted to 57 people (42.22%). This shows that trading activities at the Lambaro Traditional Market in the context of the use of scales are still more carried out by male traders. Even so, the number of female traders is also quite significant, indicating that there is an almost balanced involvement between the two genders in market activities.

The age distribution of respondents was quite diverse, with the largest group in the range of 30–39 years (31.11%) and 40–49 years (29.63%). The age group < 30 years old is only 18.52%, while traders ≥ 50 years old reach 20.74%. This pattern indicates that most traders are at a productive age, where experience and stamina still support routine and intense trading activities.

The most dominant type of business was basic food (37.04%), followed by vegetables & fruits (25.93%), meat/fish (20.74%), and other categories (16.30%). This composition illustrates that the Lambaro Traditional Market has a main focus on the basic needs of households, with basic necessities as the main commodity, while fresh commodities such as vegetables, fruits, meat, and fish also play an important role in the economic turnover of the market.

Most traders have been running their business for ≥ 10 years (37.04%), followed by 5–9 years of experienced traders (33.33%), and newcomers < 5 years (29.63%). This data shows that many traders have a long experience in trading, which can have a positive impact on compliance with the scales re-marking procedure because they are used to the rules and repetitive interactions with market managers.

Based on the respondents' profiles, it can be concluded that traders at the Lambaro Traditional Market are dominated by men of productive age with the main types of businesses in the basic necessities sector such as basic necessities, vegetables, fruits, and meat and fish. The high proportion of traders with more than five years of experience, especially those who have been trading ≥ 10 years, indicates the stability and continuity of business in this market. This condition has the potential to facilitate the implementation of a balance re-marking policy or program because most traders have long experience and openness to market regulations. However, the existence of new traders is also an opportunity to introduce re-marking procedures from an early age, so that awareness and compliance can be built evenly at all levels of business actors.

Evaluation of Measurement Model (Outer Model)

Measurement model testing will be conducted to show the results of validity and reliability tests. In this study, validity testing is conducted to determine whether the construct has met the requirements to be continued as research or not. In this validity test, there are two types of evaluations that will be conducted, namely:

Convergent Validity

Convergent Validity models measurement with items that have values based on the correlation between the item's score and the construct value. The convergent validity index is measured by the factors of AVE, composite reliability, R square, cronbach's alpha.

The results of the AVE index, composite reliability, R square, cronbach's alpha can be seen in Figure 1.

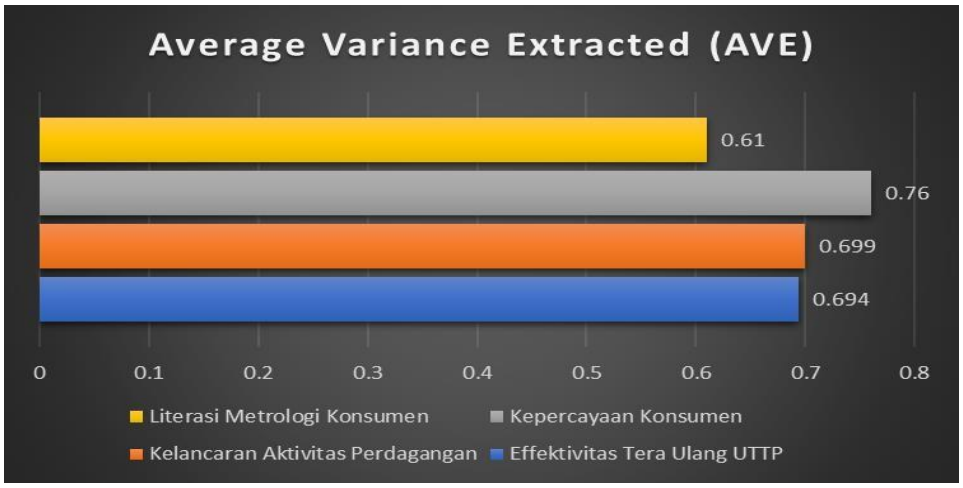

Figure 2 Average Variance Extracted

Based on the results of the Average Variance Extracted (AVE) analysis, all variables had values above the general threshold of 0.50 so that they met the criteria for convergent validity. The Consumer Confidence variable has the highest AVE value of 0.76, indicating that the indicators are able to explain the construct variant very well. Furthermore, the variable Smooth Trading Activity has an AVE value of 0.699 and the effectiveness of re-marking of measuring instruments, measures, weights, and equipment of 0.694, both of which also show the consistency of indicators in representing latent variables. Meanwhile, the Consumer Metrology Literacy variable had an AVE value of 0.61, which although the lowest among other variables, remained in the good category. Thus, it can be concluded that all the variables measured have relevant indicators and are able to adequately explain the constructs they represent. The relatively high AVE values indicate that the indicators used in the measurement of the variable are quite good at explaining the total variance in the variable.

Reliability testing is an important step in research to ensure that the instrument or measurement tool used is consistent and reliable. One commonly used approach to measuring reliability is using the Cronbach Alpha (CA) method. In the context of reliability testing, a CA value above 0.60 is considered a sign that the measurement tool has an adequate level of consistency.

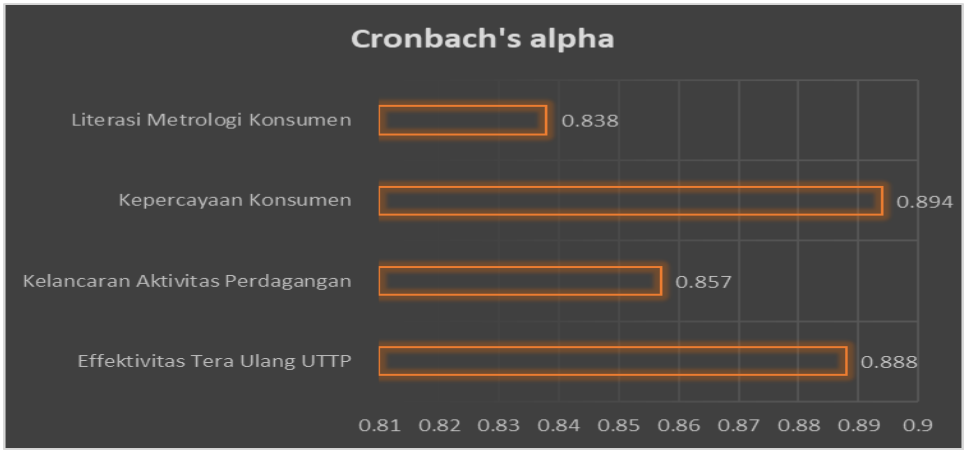

Figure 3 Cronbach Alpha Coefficient

Based on the results of the reliability analysis using Cronbach's alpha value, all variables showed values above the general threshold of 0.70, so they could be categorized as reliable. The Consumer Confidence variable has the highest Cronbach's alpha value of 0.894, indicating a very strong level of internal consistency between indicators. Furthermore, the variable of effectiveness of the re-marking of the measuring instrument, measure, weight, and equipment obtained a value of 0.888 which also shows very high reliability. The variable of Smooth Trade Activity has a value of 0.857, while Consumer Metrology Literacy recorded the lowest value of 0.838, but remains in the reliable category. Overall, these results indicate that all constructs have consistent and reliable indicators in measuring the latent variables they represent. All Cronbach Alpha values above 0.7, indicate that

the measurement instrument has a good degree of consistency, and can be considered reliable to measure the variables in question in this study.

Discriminant validity is done to ensure that each concept of each latent model is different from the other variables. Validity testing is carried out to find out how exactly a measuring instrument performs its measurement function. If the *value diagonal > other values* are in the same row. It means that there is a real difference between one variable and another.

Table 1 Discriminant Validity

	Effectiveness Re-marking of measuring instruments, measures, weights, and equipment	Smooth Trading Activity	Consumer Trust	Literacy Consumer Metrology
Effectiveness of remarks of measuring instruments, measures, weights, and equipment				
Smooth Trading Activities	0,708			
Consumer Trust	0,840	0,848		
Consumer Metrology Literacy	0,607	0,731	0,702	
Consumer Metrology Literacy X Consumer Trust	0,232	0,322	0,281	0,191

Based on the table presented, it can be seen that the values listed are correlations between latent variables. The relationship between the effectiveness of re-marking of measuring instruments, measures, weights, and equipment and the smoothness of trading activities showed a correlation of 0.708, which was relatively strong and positive, indicating that the higher the effectiveness of the re-marking of measuring instruments, measures, weights, and equipment, the smoother the trading activities. The correlation between the Effectiveness of Re-Impressions of measuring instruments, measures, weights, and equipment with Consumer Confidence was even higher, at 0.840, which shows a close relationship between the accuracy and reliability of measuring instruments and the level of consumer confidence in transactions.

Consumer Confidence also has a very high correlation with the Smooth Trading Activity (0.848), indicating that the trust factor plays an important role in smoothing the trading process. Meanwhile, Consumer Metrology Literacy has a medium to high correlation with other variables, namely 0.607 with the Effectiveness of Re-Marking measuring instruments, measures, weights, and equipment, 0.731 with Smooth Trade Activities, and 0.702 with Consumer Confidence. This indicates that consumer understanding of metrology also contributes to increasing trust and smooth trading activities.

The interaction variables of Consumer Metrology Literacy x Consumer Confidence showed a relatively low correlation with all major variables, namely 0.232 with the effectiveness of re-marking measuring instruments, measures, weights, and equipment, 0.322 with Smooth Trade Activities, 0.281 with Consumer Confidence, and 0.191 with Consumer Metrology Literacy. This low value can be interpreted as the effect of the interaction of the two variables on the other variables is not very dominant directly, although both individually have a significant influence.

Overall, the correlation patterns in this table show that the effectiveness of re-marking of measuring instruments, measures, weights, and equipment and Consumer Confidence are the two variables that have the most close relationship with other variables, while the interaction of Consumer Metrology Literacy x Consumer Confidence shows a weaker correlation in the context of this model:

Figure 4. Test R Square

Based on the results of the determination coefficient analysis (R-square), it can be seen that the variable of Smooth Trading Activity has an R-square value of 0.631, which means that 63.1% of the variation in the smooth trading activity can be explained by the independent variables contained in the model. The R-square adjusted value of 0.621 indicates a slight adjustment due to the number of predictors and sample size, but the difference is not significant, so the model still has strong explanatory power.

Meanwhile, the Consumer Confidence variable has an R-square value of 0.569, which indicates that 56.9% of the variation in consumer confidence can be explained by the relevant independent variables in the model. The R-square adjusted value of 0.566 shows that the effect of adjustment on the R-square value is also very small, indicating that the model is quite stable and does not experience significant overfitting

Loading Factor

Confirmatory factor analysis is a crucial stage in the measurement of the dimensions that form the latent variables in the framework of this study. The latent variables or constructs applied in this research model consist of three exogenous variables and two endogenous variables, which include mediating and dependent variables.

Table 2. Loading Factor

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P Values
A1 <- Effectiveness of Remarking Measuring Instruments, Measures, Weights, and Equipment	0.770	0.773	0.080	9.603	0.000
A2 <- Effectiveness of Remarking Measuring Instruments, Measures, Weights, and Equipment	0.910	0.909	0.017	52.642	0.000
A3 <- Effectiveness of Remarking Measuring Instruments, Gauges, Weights, and Equipment	0.870	0.869	0.027	31.845	0.000
A4 <- Effectiveness of Remarking Measuring Instruments, Gauges, Weights, and Equipment	0.760	0.757	0.071	10.694	0.000
A5 <-Effectiveness of Remarking Measuring Instruments, Measures,	0.846	0.845	0.028	30.294	0.000

Weights, and Fittings					
b1 <-Consumer Confidence	0.872	0.870	0.026	33.284	0.000
b2 <-Consumer Trust	0.839	0.835	0.057	14.632	0.000
b3 <-Consumer Trust	0.866	0.864	0.028	30.494	0.000
b4 <-Consumer Trust	0.907	0.906	0.019	48.487	0.000
c1 <-Smooth Trading Activity	0.849	0.850	0.022	38.084	0.000
c2 <-Smooth Trading Activities	0.894	0.897	0.017	53.667	0.000
c3 <-Smooth Trading Activities	0.864	0.864	0.052	16.762	0.000
c4 <-Smooth Trading Activity	0.728	0.730	0.091	8.005	0.000
d1 <- Consumer Metrology Literacy	0.730	0.732	0.045	16.155	0.000
d2 <- Consumer Metrology Literacy	0.695	0.701	0.051	13.699	0.000
d3 <- Consumer Metrology Literacy	0.791	0.789	0.040	19.950	0.000
d4 <- Consumer Metrology Literacy	0.863	0.859	0.024	35.862	0.000
d5 <- Consumer Metrology Literacy	0.813	0.811	0.030	26.995	0.000

Based on the results of the outer loading analysis, all indicators in this study variable showed good convergent validity because the loading factor value was above 0.70 or close, and all were significant at a significance level of 5% ($p < 0.05$). In the reconstruction of the effectiveness of the measuring instrument, measure, weighing, and equipment, the outer loading value ranges from 0.760 to 0.910. The indicator with the highest value was a2 (0.910), which indicates that the competence and expertise of the officers are the strongest representation of the effectiveness of the re-marking service. The lowest loading value (a4 = 0.760) remains above the minimum limit, so it remains valid.

Overall, these findings confirm that all indicators in the model have met the convergent validity criteria. This means that each indicator is able to explain the construct it represents well. The indicators with the highest loading values can be used as the main focus in the formulation of improvement strategies, while the indicators with the lowest values still need to be considered so that their contribution to the construct does not decrease in the future

Hypothesis Test Results

After all assumptions can be met, then hypothesis testing will be carried out as proposed in the previous chapter. The testing of 6 direct hypotheses of this study was carried out based on the Critical Ratio (CR) value of a causal relationship from the results of SEM processing as shown in figure 5 of the structural model analysis and table 3 below.

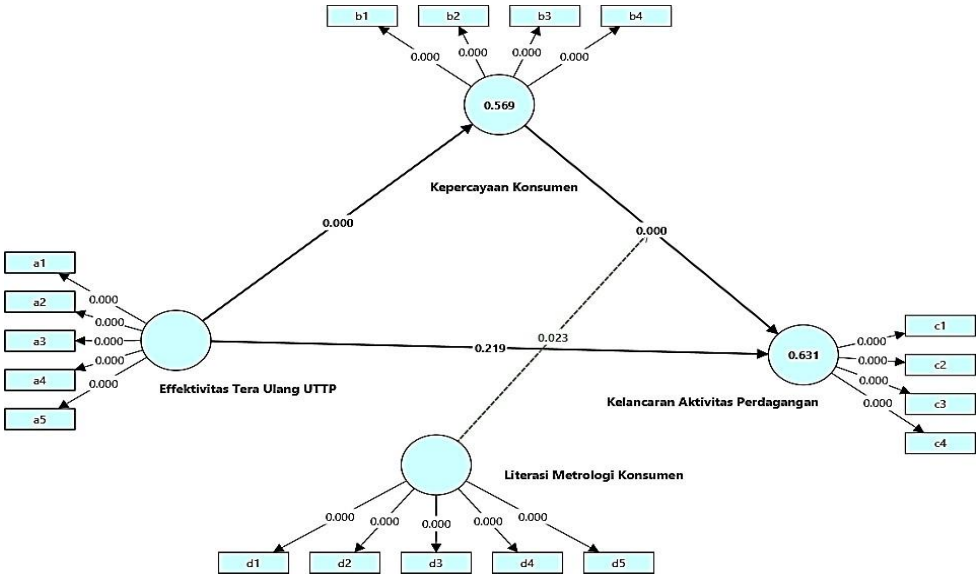

Figure 4. Structural Models for Hypothesis Proof

To assess the significance of the influence between variables, a bootstrapping procedure was carried out. The bootstrap procedure uses the entire original sample to then be resampled. In the bootstrap resampling method, the significance value used (two-tailed) t-value is 1.96 (significance level 5).

Table 3.Total Effect

	Original Sample (0)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P-Values
Effectiveness of Re-Marking MEASURING INSTRUMENTS, MEASURES, WEIGHS, AND THEIR EQUIPMENT ->Smoothness Trading Activity	0.107	0.112	0.087	1.230	0.219
Effectiveness of Re-Marking MEASURING INSTRUMENTS, MEASURES, WEIGHS, AND EQUIPMENT -> Trust User	0.754	0.754	0.048	15.778	0.000
Consumer Confidence -> Smooth Trading Activities	0.499	0.491	0.092	5.397	0.000
Consumer Metrology Literacy x Consumer Trust -> Smooth Activities Trade (Moderation)	0.097	-0.091	0.042	2.279	0.023

Based on the results of the total effect contained in Table 3. It shows that there are 5 paths that have significance to their constructs with a statistical t-value greater than 1.96 and a p-value less than 0.05, meaning that the entire path has a good significant value.

Based on this description, to find out whether a hypothesis is accepted or rejected, it can be done by paying attention to the significance value between constructs, t-statistics and p-values. Then measurement estimates and standard errors are no longer calculated on statistical assumptions, but are based on empirical observations. In the bootstrap resampling method in this study, the hypothesis is accepted that if the significance value of the t-value is greater than 1.96 and/or the p-value is less than 0.05, then Ha is accepted and Ho is rejected and vice versa.

Based on Table 3. The determination of the accepted or rejected hypothesis is explained as follows:

The direct relationship between the effectiveness of re-marking measuring instruments, measures, weights, and equipment on the smooth running of trading activities has a beta coefficient of 0.107, *t-statistics* 1.230, and *a p-value* of 0.219. This value does not meet the criteria of significance, so this hypothesis is not accepted. This means that the effectiveness of the re-marking directly does not have a significant influence on the smooth running of trading activities, even though the direction of the relationship is positive.

The relationship between the effectiveness of the re-marking of measuring instruments, measures, weights, and their equipment and consumer confidence showed a very high beta coefficient, which was 0.754, with *a t-statistic* of 15.778 and *a p-value* of 0.000. This shows a very strong and significant positive influence, so that the more effective the re-marking service, the higher the consumer trust.

The direct relationship between *Consumer Confidence* and *Smooth Trading Activity* has a beta coefficient of 0.499, with *a t-value* of 5.397 and *a p-value* of 0.000. This signifies a fairly strong positive influence, where increased consumer confidence contributes significantly to the smooth running of trade.

The Relationship between Consumer Confidence and the Smooth Trading Activities The effect of the moderation of Consumer Metrology Literacy on the relationship between Consumer Confidence and the Smooth Trading Activity has a beta coefficient of 0.097, t-statistics 2.279, and a p-value of 0.023. This value is significant, showing that metrological literacy strengthens the relationship between consumer confidence and smooth trading activities, although the magnitude of its effect is relatively small compared to the direct effect.

Testing this mediation or indirect hypothesis uses Bootsrapping. The results can be seen in the following section.

Table 4. Specific Indirect Effect

Construct	Original Sample (0)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P-Values
Effectiveness of re-marking tools, measures, balances, and their equipment -> Consumer Confidence -> Smooth Trading Activities	0.376	0.371	0.077	4.893	0.000

The results of the indirect effect test showed that the effectiveness path of re-marking the measuring tools, measures, weights, and equipment → Consumer Confidence → Smooth Trading Activities had a beta coefficient of 0.376 with a t-statistic of 4.893 and a p-value of 0.000. This value met the significance criteria ($p < 0.05$ and $t > 1.960$), so it can be concluded that the indirect influence is statistically significant.

These findings confirm the role of full mediation in the relationship between the effectiveness of remarks and the smooth running of trade. Without an increase in consumer confidence, the effectiveness of re-impressions will not be able to directly facilitate trading activities. Therefore, the strategy to improve the re-impression service needs to be explicitly focused on aspects that can strengthen consumer trust, such as the transparency of the results, the professionalism of the officers, and the physical evidence of the impressions that are easily verified.

Managerial Implications

The results of this study provide a fairly clear picture of how the effectiveness of re-marking measuring instruments, measures, weights, and equipment, Consumer Confidence, and Consumer Metrology Literacy interact in influencing the Smooth Flow of Trade Activities. This finding is important for policy makers, especially for local government agencies, the Regional Technical Implementation Unit of Legal Metrology, and business actors who use measuring instruments in trade activities.

Focus on Consumer Trust as the Main Pathway

The findings showed that the effectiveness of re-marking of measuring instruments, measures, weights, and equipment had a very strong direct influence on Consumer Confidence ($\beta = 0.754$) and this effect was statistically significant ($p < 0.001$). However, the direct effect of the effectiveness of remarks on the Smooth Trading Activity was not significant ($\beta = 0.107$; $p = 0.219$). In contrast, the pathway through Consumer Confidence produced significant and considerable indirect effects ($\beta = 0.376$; $t = 4.893$).

This has the implication that the strategy to improve re-tagged services should be directed at strengthening consumer confidence, not just ensuring regulatory compliance. Regional Technical Implementation Unit Managers and local governments can develop service quality improvement programs that are explicitly oriented towards customer trust building (OECD. 2019). For example, including a more communicative explanation of the results of the remark, providing a certificate or tag that is easier to recognize, and building a professional image of officers through uniforms, official identities, and friendly service attitudes.

For business actors, it is important to understand that the results of re-branding not only fulfill legal obligations, but also become a marketing tool that can improve the image of the business. By highlighting valid and clearly installed re-marking evidence in the transaction area, consumers will feel more confident and comfortable to transact.

The Role of Consumer Trust in Smooth Trade

The relationship between Consumer Confidence and Smooth Trading Activity was significant ($\beta = 0.499$; $p < 0.001$), suggesting that when consumers trust the accuracy of the measuring tool, the transaction process becomes faster, less disputed, and less potential for conflict. The implication for traditional market managers, shopping centers, and business actors is to ensure that all measuring instruments have been officially remarked and proof of the re-marking results can be accessed or viewed by consumers. This transparency will reduce the need for consumers to re-verify and speed up the buying and selling process.

This result is also a signal for local governments to brand legal metrology services as public trust enhancers. Public campaigns can be focused on the message that remarks not only comply with regulations, but also protect consumer rights and ensure fairness in transactions (Mehralian, 2022).

The Moderation Effect of Consumer Metrology Literacy

The moderation findings showed that Consumer Metrology Literacy strengthened the relationship between Consumer Confidence and Smooth Trade Activity ($\beta = 0.097$; $p = 0.023$). This means that consumer trust supported by a good understanding of legal metrology will have a more optimal impact on the smooth flow of transactions. The managerial implications of these findings are the importance of public education programs related to legal metrology. The local government through the Trade Office and the Regional Technical Implementation Unit of Legal Metrology can organize socialization in traditional markets, wholesale centers, and large stores. Education can be done in the form of (Xu, 2022).

1) Permanent information boards in the marketplace that explain the meaning of stamps and the importance of restamps.

2) Social media campaigns with simple but informative visual content, such as short videos that show the re-marking process.

3) Direct counseling to merchant groups and business associations, with materials tailored to be easy to understand

For business actors, improving consumer metrology literacy can also be done individually. For example, by providing a short brochure at the place of business explaining that their measuring instrument has been re-tagged and what benefits it will be to consumers (Zhang, Li, & Wang, 2023). This education not only increases understanding, but also builds a business reputation as an honest and law-abiding business person.

Indirect Influence and Full Mediation

The indirect effect of the effectiveness of the re-marking of measuring instruments, measures, weights, and equipment on the smooth running of trading activities through significant Consumer Confidence ($\beta = 0.376$; $p < 0.001$) indicates full mediation. This means that without building consumer trust first, the effectiveness of re-impressions will not directly facilitate trading activities. Implicitly, the re-branded service management strategy must consciously include trust building indicators in performance evaluation. During this time, the evaluation of the re-tag service may focus only on the number of tools re-tagged, timeliness, or facility availability. Going forward, the evaluation should add indicators such as (Consumer satisfaction level, consumer understanding level of re-impressions results, and consumer confidence level after receiving service).

With this indicator, service managers can assess whether the services provided are truly impacting trust, ultimately affecting the smooth running of trading.

Policy Integration and Collaborative Approaches

The results of the study also hint at the need for policy integration between the government, trade associations, and business actors. Local governments through the Regional Technical Implementation Unit of Legal Metrology play a central role in providing quality re-marking services, but the success of improving trade smoothness also depends on the role of business actors in highlighting the results of re-marking as a guarantee of trust for consumers (UNESCO. 2017). A collaborative approach can be carried out through: 1) Market or store certification programs that routinely re-mark and highlight the results in the business area. 2) Awards or incentive for perp effort that actively educate consumers about the importance of legal metrology. 3) Joint activities between Regional Technical Implementation Units, traders' associations, and consumer protection NGOs to conduct massive socialization (Rahman, Khan, & Haque, 2022).

Long-Term Benefits

If the findings of this study are implemented in business policies and practices, the long-term benefits that can be obtained include: 1) Increased transaction efficiency due to the lack of size disputes. 2) Increased customer loyalty due to high trust in the measuring instruments used. 3) Reputation positive for perp efforttha
Comply with and promote re-impressions. 4) Increased public awareness of the importance of legal metrology, which ultimately encourages wider compliance among merchants.

Overall, the results of this study provide a key message that the effectiveness of re-marking measuring instruments, measures, weights, and equipment will only have an optimal impact on the Smooth Flow of Trade Activities if accompanied by efforts to build Consumer Trust and improve Consumer Metrology Literacy. Therefore, the right managerial strategy is to position re-marking services not only as an administrative obligation, but as a strategic instrument to increase business competitiveness, strengthen relationships with consumers, and support the smooth running of sustainable trade.

CONCLUSION

Based on the results of data analysis and discussion, several conclusions can be drawn as follows:

1. The effectiveness of re-marking of measuring instruments, measures, weights, and equipment had a significant effect on Consumer Confidence, with a large coefficient of influence ($\beta = 0.754$; $p < 0.001$). This means that the more effective the re-marking service provided by the Legal Metrology Regional Technical Implementation Unit—including facility feasibility, officer competence, timeliness, and cost transparency—the higher the level of consumer trust in business actors who use the measuring tool.

2. The effectiveness of the remarks of measuring instruments, measures, weights, and equipment did not have a significant direct effect on the smooth running of trading activities ($\beta = 0.107$; $p = 0.219$). These findings show that increasing the effectiveness of re-impressions does not necessarily facilitate trade transactions without an increase in consumer confidence first.

3. Consumer Confidence has a significant effect on the Smooth Trading Activity ($\beta = 0.499$; $p < 0.001$). This trust is the key to creating smooth, minimal, and efficient transactions.

4. Consumer Metrology Literacy moderated the relationship between Consumer Confidence and Smooth Trade Activity positively and significantly ($\beta = 0.097$; $p = 0.023$). Consumers who have a better understanding of legal metrology tend to make better use of this trust in smoothing the trading process.

5. There is a significant indirect effect of the effectiveness of re-marking tools, measurements, weights, and equipment on the smooth running of trading activities through Consumer Confidence ($\beta = 0.376$; $p < 0.001$). This confirms that the role of consumer trust is to be a full mediator in the relationship.

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