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Differences in Non-Cash Payments Proportion across MSMEs Groups in Kampung Baru: A Kruskal–Wallis Analysis

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Abstract

The digital transformation of payment systems has altered transaction landscapes for Micro, Small, and Medium Enterprises (MSMEs). However, non-cash payment adoption remains uneven and highly dependent on business characteristics. This study analyzes differences in non-cash payment proportions on revenue and expenditure sides among six MSME groups in Kampung Baru: grocery stalls, laundries, photocopy shops, street vendors, restaurants, and other MSMEs. Since data did not meet normality and homogeneity assumptions, the nonparametric Kruskal-Wallis test was employed, followed by Dunn-Bonferroni post hoc tests. Results confirm significant differences in non-cash revenue and expenditure proportions across groups. Interestingly, a stark asymmetry emerges: service-oriented businesses accept and pay non-cash symmetrically, whereas trade and food businesses accept non-cash from customers but still rely heavily on cash for supplier payments and operational costs. This implies that digital literacy programs and non-cash payment policies must be tailored to each MSME group's transaction characteristics and supply chain ecosystems, rather than generalized.

Keywords: Financial Proportion, Kruskal-Wallis, MSMEs, Non-Cash Payment, Transaction Asymmetry.

INTRODUCTION

The rapid development of financial technology (FinTech) has fundamentally shifted global transaction behavior from physical cash to digital or non-cash payments. In Indonesia, this shift is marked by the widespread adoption of QRIS (Quick Response Code Indonesian Standard), mobile banking, and e-wallets. This phenomenon offers

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various benefits for businesses, ranging from efficient record-keeping and enhanced security to expanding the customer base (Marlinah, 2021).

However, the reality on the ground shows that not all Micro, Small, and Medium Enterprises (MSMEs) adopt this system with the same intensity. MSMEs are not a homogeneous entity; they consist of diverse sectors with distinct operational scales, customer profiles, and supply chain structures. These differences cause disparities in the proportion of non-cash usage, particularly when comparing the inflow of funds (revenue) and the outflow of funds (expenditure/input).

Kampung Baru, as an area with high business heterogeneity, provides an ideal context to examine this phenomenon. The six dominant MSME categories in this region laundries, grocery stalls (warung klontong), photocopy shops, street vendors (PKL), restaurants, and other MSMEs (including barbershops, florists, pharmacies, and fresh vegetable sellers) have different business models and transaction patterns. For instance, a grocery stall serving daily neighborhood needs will naturally have a different transaction profile compared to a laundry service that handles bulk weekly orders. International evidence from India reinforces this point: a survey of over 1,000 merchants across 120 cities found that street vendors received only about 46% of payments digitally, while cash remained dominant for transactions below a certain threshold (Kearney & Amazon Pay, 2024). This pattern suggests that business type not just size shapes how deeply digital payments penetrate daily operations.

This study limits its focus to one main question: is there a difference in the average proportion of non-cash payment usage in revenue and expenditure (input) across MSME groups in Kampung Baru? The objective is to analyze these differences statistically. This study does not aim to build a predictive or regression model, nor does it seek to establish causal relationships. Instead, it maps the differences in proportions between business groups using a nonparametric comparative approach, providing a descriptive snapshot of digital adoption at the grassroots level.

OBJECTIVES

This article intends

1. To test whether the average proportion of non-cash payments in revenue (sales receipts) differs across MSME groups in Kampung Baru;
2. To test whether the average proportion of non-cash payments in expenditure (inputs) differs across MSME groups;
3. To identify which pairs of groups differ and to describe the resulting tiers of non-cash use;
4. To compare the revenue and expenditure sides and to interpret the pattern with the theory of the demand for money; and

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5. To derive implications for MSMEs, local government, and monetary and payment-system authorities.

LITERATURE REVIEW

Non-Cash Payment Adoption in MSMEs

The adoption of digital payments among MSMEs is a complex process influenced by various factors. Previous studies using the Technology Acceptance Model (TAM) have highlighted that perceived ease of use and perceived usefulness are primary drivers of QRIS adoption among MSMEs in non-metropolitan areas (Pratama & Sari, 2025). However, adoption is not solely determined by individual perceptions. A study of small-scale merchants in Jaipur, India, found that even among those who had adopted digital payments, approximately 80% of their transactions with customers were still conducted in cash (Ligon et al., 2019). This indicates that adoption and usage intensity are distinct phenomena; a business may accept QRIS while remaining heavily cash-dependent in practice.

Moreover, the adoption rate is not uniform across sectors. The service sector, such as laundries and photocopy shops, may have different adoption rates compared to the trade sector, such as grocery stalls or street vendors, due to differences in transaction values and customer expectations (Palupi et al., 2021). Recent evidence from rural Indonesia shows that adoption is often reactive, driven by customer demand, with usage intensity limited to 20–40% and concentrated on basic features (Wulan & Zatadini, 2026). Previous studies have highlighted that while digital payments offer efficiency, MSMEs often face barriers such as limited digital literacy, transaction fees, and the initial cost of adopting new technology. Furthermore, the adoption rate is not uniform across sectors. The service sector, such as laundries and photocopy shops, may have different adoption rates compared to the trade sector, such as grocery stalls or street vendors, due to differences in transaction values and customer expectations.

Nonparametric Approach in Small Business Research

The Kruskal-Wallis test is an appropriate nonparametric method when data are not normally distributed, and variances between groups are not homogeneous. This test compares the median or mean rank of more than two independent groups, making it highly suitable for analyzing distorted proportion data commonly found in self-reported surveys (Field, 2018). Unlike ANOVA, which relies on the mean and assumes a normal distribution, Kruskal-Wallis is robust against outliers and skewed data, providing a more reliable comparison for heterogeneous MSME samples.

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RESEARCH METHODOLOGY

Design and Sample

This study uses a quantitative comparative approach. Data were collected through structured questionnaires distributed to MSME actors in Kampung Baru. A total of 123 valid respondents were obtained, representing six business categories: restaurants (n=38), street vendors (n=27), photocopy shops (n=18), grocery stalls (n=14), laundries (n=13), and other MSMEs (n=13). The unequal group sizes should be noted when comparing the groups, though the nonparametric test is relatively robust to this condition.

Variables and Measurement

The main variables measured in this study are the proportion of non-cash usage on the revenue side and the expenditure side. Respondents were asked to estimate the percentage (0% to 100%) of their total revenue received via non-cash methods (QRIS, bank transfer, e-wallet) and the percentage of their total expenditure paid via non-cash methods. Expenditures cover raw materials, wages, electricity, and building rent.

Data Analysis Procedure

Before hypothesis testing, a normality test was conducted using the Shapiro-Wilk test due to the moderate sample size. The test results showed a significance value (p-value) below 0.05 for almost all groups, meaning the data were not normally distributed. Therefore, ANOVA could not be used, and the analysis proceeded with the nonparametric Kruskal-Wallis test. The hypothesis formulated was:
H0: There is no difference in the proportion of non-cash usage across MSME groups.
H1: There is a difference in the proportion of non-cash usage across MSME groups.

If the null hypothesis (H0) was rejected, the analysis continued with the Dunn-Bonferroni post hoc test to identify which specific groups differed significantly, while controlling for Type I errors.

RESULTS AND DISCUSSION

Respondent Profile

Table 1: Respondent Profile (N = 123)

Characteristic	Category	Percentage (%)
Gender	Female	50.4
	Male	49.6
Age (years)	19–25	8
	26–32	50

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	33–39	18
	40–46	15
	47–53	9
Type of MSME	Restaurants	30.9 (n = 38)
	Street vendors (PKL)	22.0 (n = 27)
	Photocopy shops	14.6 (n = 18)
	Grocery stalls (*warung klontong*)	11.4 (n = 14)
	Laundries	10.6 (n = 13)
	Other MSMEs	10.6 (n = 13)
Cashless platform used	Dana	30.9
	BRI	29.3
	BNI	19.5
	BCA	13.0
	Mandiri	7.3

Source: primary data from the questionnaire. Percentages for age and platform are as reported in the survey charts; group percentages are computed from the group sizes.

Of the 123 respondents, the majority were women (50.4%) and in the productive age group of 26–32 years (50%). The largest business group was restaurants (30.9%), followed by street vendors (22.0%), photocopy shops (14.6%), grocery stalls (11.4%), and laundries and other MSMEs at 10.6% each. The most widely used non-cash payment platforms were Dana (30.9%) and BRI (29.3%). The dominance of working-age owners suggests a higher potential for digital adoption, as this demographic is generally more tech-savvy.

General Overview of Non-Cash Usage

Table 2: Non-Cash and Cash Shares in Revenue and Expenditure

Cash-flow side	Measure	Non-cash (%)	Cash (%)
Revenue (receipts)	Mean proportion per respondent	53.98	46.02
	Share of total reported value	54.46	45.54
Expenditure (inputs)	Mean proportion per respondent	28.67	71.33
	Share of total reported value	36.51	63.49

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Source: primary data from the questionnaire (processed). Expenditure covers raw materials, wages, electricity and rent.

In aggregate, non-cash usage is more dominant on the revenue side than on the expenditure side. The average respondent received 53.98% of revenue non-cash but paid only 28.67% of expenditure non-cash. This gap of about 25 percentage points indicates that cash remains the dominant instrument for paying business inputs (such as raw materials, wages, and electricity). This initial finding sets the stage for understanding the asymmetry that occurs at the business level.

Normality and Descriptive Statistics for Revenue

Table 3: Normality Test and Descriptive Statistics of the Non-Cash Proportion in Revenue

MSME group	n	Median	IQR	Shapiro–Wilk (*p*)	Normality
Street vendors (PKL)	27	0.4242	0.1143	0.004	Not normal
Grocery stalls	14	0.5202	0.0091	< 0.001	Not normal
Restaurants	38	0.5347	0.0215	0.001	Not normal
Photocopy shops	18	0.5665	0.0089	< 0.001	Not normal
Other MSMEs	13	0.5737	0.0425	0.017	Not normal
Laundries	13	0.6034	0.0290	0.032	Not normal

Source: primary data from the questionnaire, SPSS 31 (processed). Decision at α = 0.05.

Based on the Shapiro-Wilk normality test, the revenue proportion data were not normal across all groups ($p < 0.05$). The median ranged from 0.4242 for street vendors to 0.6034 for laundries. The data dispersion (IQR) varied greatly; the IQR for street vendors (0.1143) was more than twelve times that of photocopy shops (0.0089). This wide dispersion indicates that some street vendors are highly cash- dependent, while a small fraction might have adopted non-cash payments significantly, creating a polarized distribution.

The Kruskal-Wallis test on the revenue side yielded an $H = 72.191$ with degrees of freedom (df) = 5 and an asymptotic significance of $p < 0.001$. This value indicates the rejection of H0, meaning there are significant differences in the proportion of non-cash revenue among MSME groups. The effect size (ε^2) of 0.59 is considered large, suggesting that the type of MSME strongly explains the variance in non-cash revenue adoption.

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Table 4: Mean Rank of the Non-Cash Proportion in Revenue

Position	MSME group	n	Median	IQR	Mean rank
1 (highest)	Laundries	13	0.6034	0.0290	102.15
2	Other MSMEs	13	0.5737	0.0425	86.69
3	Photocopy shops	18	0.5665	0.0089	85.56
4	Restaurants	38	0.5347	0.0215	64.89
5	Grocery stalls	14	0.5202	0.0091	45.64
6 (lowest)	Street vendors (PKL)	27	0.4242	0.1143	19.48

Source: primary data from the questionnaire, SPSS 31 (processed).

Based on the Mean Rank table, laundries held the highest position in non-cash revenue (102.15), followed by other MSMEs (86.69), photocopy shops (85.56), restaurants (64.89), grocery stalls (45.64), and street vendors as the lowest (19.48).

Table 5: Dunn–Bonferroni Pairwise Comparisons, Revenue

Pair	Mean-rank difference	Std. error	Std. test statistic	Sig.	Adj. sig.	Diff.
PKL – Grocery stalls	26.161	11.741	2.228	0.026	0.388	No
PKL – Restaurants	45.413	8.973	5.061	< 0.001	< 0.001	Yes
PKL – Photocopy shops	66.074	10.848	6.091	< 0.001	< 0.001	Yes
PKL – Other MSMEs	67.211	12.035	5.585	< 0.001	< 0.001	Yes
PKL – Laundries	82.672	12.035	6.869	< 0.001	< 0.001	Yes
Grocery stalls – Restaurants	19.252	11.146	1.727	0.084	1.000	No
Grocery stalls – Photocopy shops	39.913	12.704	3.142	0.002	0.025	Yes
Grocery stalls – Other MSMEs	41.049	13.731	2.990	0.003	0.042	Yes
Grocery stalls – Laundries	56.511	13.731	4.116	< 0.001		
Restaurants – Photocopy shops	20.661	10.201	2.025	0.043	0.642	No
Restaurants – Other MSMEs	21.798	11.455	1.903	0.057	0.856	No
Restaurants – Laundries	37.259	11.455	3.253	0.001	0.017	Yes
Photocopy shops – Other MSMEs	1.137	12.976	0.088	0.930	1.000	No
Photocopy shops – Laundries	16.598	12.976	1.279	0.201	1.000	No
Other MSMEs – Laundries	15.462	13.983	1.106	0.269	1.000	No

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Source: primary data from the questionnaire, SPSS 31 (processed). Absolute values are shown; direction follows the mean ranks in Table 4. Diff. = significant difference after Bonferroni adjustment (α = 0.05). Sig. values are unadjusted; Adj. sig. values are Bonferroni-adjusted.

The Dunn-Bonferroni post hoc test grouped the MSMEs into several tiers. Laundries, other MSMEs, and photocopy shops formed the upper tier (not significantly different from each other, p = 1.000). Meanwhile, street vendors and grocery stalls formed the lower tier. Street vendors differed significantly from all groups except grocery stalls (p = 0.388).

Normality and Descriptive Statistics for Expenditure

Table 6: Normality Tests of the Non-Cash Proportion in Expenditure

MSME group	n	S–W statistic	S–W sig.	Normality
Restaurants	38	0.903	0.003	Not normal
Laundries	13	0.653	< 0.001	Not normal
Photocopy shops	18	0.375	< 0.001	Not normal
Grocery stalls	14	0.345	< 0.001	Not normal
Street vendors (PKL)	27	0.625	< 0.001	Not normal
Other MSMEs	13	0.940	0.463	Normal

Source: primary data from the questionnaire, SPSS 31 (processed). S–W = Shapiro–Wilk.

[a] Lower bound of the true significance.

On the expenditure side, the normality test also showed non-normal data for the majority of groups. The Kruskal-Wallis test yielded an H = 96.358 with df = 5 and p < 0.001, meaning there are significant differences in the proportion of non-cash expenditure among groups. The effect size (ε^2) of 0.79 is very large, even exceeding the effect on the revenue side. This suggests that the way businesses pay their expenses is even more heavily determined by their business type than the way they receive payments.

Table 7: Mean Rank of the Non-Cash Proportion in Expenditure

Position	MSME group	n	Mean rank	Tier
1 (highest)	Photocopy shops	18	104.19	High
2	Laundries	13	99.42	High

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3	Other MSMEs	13	95.62	High
4	Grocery stalls	14	72.21	Transitional
5	Street vendors (PKL)	27	44.02	Low
6 (lowest)	Restaurants	38	26.72	Low

Source: primary data from the questionnaire, SPSS 31 (processed). Tiers follow the post hoc results in Table 8.

The Mean Rank table for expenditure shows an interesting shift in rankings. Photocopy shops held the highest position (104.19), followed by laundries (99.42), other MSMEs (95.62), grocery stalls (72.21), street vendors (44.02), and restaurants became the lowest (26.72). The post hoc test showed that photocopy shops, laundries, and other MSMEs formed an upper tier (p = 1.000).

Table 8: Dunn–Bonferroni Pairwise Comparisons, Expenditure

Pair	Mean-rank difference	Std. error	Std. test statistic	Sig.	Adj. sig.	Diff.
Restaurants – PKL	17.295	8.972	1.928	0.054	0.808	No
Restaurants – Grocery stalls	45.491	11.144	4.082	< 0.001	0.001	Yes
Restaurants – Other MSMEs	68.892	11.453	6.015	< 0.001	< 0.001	Yes
Restaurants – Laundries	72.699	11.453	6.348	< 0.001	< 0.001	Yes
Restaurants – Photocopy shops	77.471	10.199	7.596	< 0.001	< 0.001	Yes
PKL – Grocery stalls	28.196	11.739	2.402	0.016	0.245	No
PKL – Other MSMEs	51.597	12.033	4.288	< 0.001	< 0.001	Yes
PKL – Laundries	55.405	12.033	4.605	< 0.001	< 0.001	Yes
PKL – Photocopy shops	60.176	10.846	5.548	< 0.001	< 0.001	Yes
Grocery stalls – Other MSMEs	23.401	13.729	1.705	0.088	1.000	No
Grocery stalls – Laundries	27.209	13.729	1.982	0.047	0.712	No
Grocery stalls – Photocopy shops	31.980	12.702	2.518	0.012	0.177	No
Other MSMEs – Laundries	3.808	13.981	0.272	0.785	1.000	No
Other MSMEs – Photocopy shops	8.579	12.974	0.661	0.508	1.000	No
Laundries – Photocopy shops	4.771	12.974	0.368	0.713	1.000	No

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Source: primary data from the questionnaire, SPSS 31 (processed). Absolute values are shown; direction follows the mean ranks in Table 7. Diff. = significant difference after Bonferroni adjustment (α = 0.05). Sig. values are unadjusted; Adj. sig. values are Bonferroni-adjusted.

All three differed significantly from restaurants and street vendors ($p < 0.001$). Restaurants and street vendors did not differ from each other ($p = 0.808$). Grocery stalls occupied a transitional position; they differed significantly from restaurants ($p = 0.001$) but did not differ significantly from street vendors (0.245), other MSMEs (1.000), laundries (0.712), or photocopy shops (0.177).

Comparing Revenue and Expenditure

Table 9: Summary of the Kruskal–Wallis Tests

Dependent variable	n	*H*	df	Asymp. sig.	ε^2	Effect size	Decision
Non-cash proportion in revenue	123	72.191	5	< 0.001	0.59	Large	Reject H0
Non-cash proportion in expenditure	123	96.358	5	< 0.001	0.79	Large	Reject H0

Source: primary data from the questionnaire, SPSS 31 (processed). $\varepsilon^2 = H/(n - 1)$.

When comparing both sides, the differences among MSME groups were stronger on the expenditure side (effect size 0.79) than on the revenue side (effect size 0.59). There was a shift in the position of business groups between revenue and expenditure:

1. Restaurants dropped from a middle position in revenue (64.89) to the bottom position in expenditure (26.72). This indicates that while they are somewhat open to receiving digital payments, they are highly reliant on cash for their operational expenses.
2. Grocery stalls rose from the bottom position in revenue (45.64) to a transitional position in expenditure (72.21).
3. Street vendors remained low on both sides (19.48 and 44.02), confirming their heavy reliance on cash for both receiving and paying.
4. Laundries, photocopy shops, and other MSMEs consistently remained in the upper positions on both transaction sides, indicating a more mature digital adoption.

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Table 10: Expenditure (Inputs) by Payment Method and MSME Group (% of Total Expenditure)

MSME group	Non-cash	Cash	Total	Non-cash share within group (%)[a]
Restaurants	3.16	23.25	26.41	11.97
Laundries	4.90	3.00	7.90	62.03
Photocopy shops	7.55	4.87	12.42	60.79
Grocery stalls	12.32	21.51	33.84	36.41
Street vendors (PKL)	1.22	6.52	7.74	15.76
Other MSMEs	7.35	4.34	11.69	62.87
Total	**36.51**	**63.49**	**100.00**	**36.51**

Source: primary data from the questionnaire (processed). Expenditure covers raw materials, wages, electricity and building rent. Columns 2 to 4 are percentages of total expenditure of all MSMEs. [a] Calculated by the authors as the non-cash share divided by the group total.

Field data revealed a clear asymmetry between how MSMEs receive money and how they spend it. Two different business patterns emerged:

1. Symmetrical Pattern: Laundries, photocopy shops, and other MSMEs pay their expenses in the same way they receive payments (dominantly non-cash). Their business models align well with digital financial infrastructure.
2. Asymmetrical Pattern: Restaurants, grocery stalls, and street vendors accept non-cash payments from customers but heavily dominate their expenditure payments with cash.

The most striking contrast occurred in restaurants. More than half of their revenue (54.84%) was received non-cash, yet almost nine out of ten (88.03%) of their expenditures were paid in cash. Grocery stalls and street vendors showed a similar pattern, where their cash expenditures reached 63.59% and 84.24%, respectively.

This phenomenon can be explained through the Keynesian transaction motive and the structure of the supply chain. Restaurants, grocery stalls, and street vendors generally buy raw materials daily in small quantities from traditional markets or wholesalers who do not yet accept non-cash payments (QRIS). Therefore, they must provide cash on hand at all times for operational continuity. Conversely, service businesses like laundries and photocopy shops have expenses dominated by electricity, rent, and machine/supply purchases that can be paid through institutional bank transfers or digital platforms. This asymmetry highlights a bottleneck in the digital payment ecosystem: the downstream (consumers) is ready, but the upstream (suppliers) is not.

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Implications for Policy and Practice

The findings of this study have several practical implications. First, digital literacy programs should not be one-size-fits-all. For trade and culinary sectors (restaurants, grocery stalls, street vendors), interventions must target the supplier ecosystem (upstream) to accept digital payments. It is not enough to just equip merchants with QRIS; the wholesalers and traditional market vendors must also be onboarded. This recommendation aligns with evidence from a systematic review of digital wallet adoption among microentrepreneurs in Asia and Latin America, which found that adoption is consistently shaped by trust, perceived usefulness, and institutional support—not merely by technological availability (Vásquez-Vásquez et al., 2026). The review further notes that perceived risk and weak institutional frameworks remain persistent barriers, suggesting that supplier-side onboarding must be accompanied by trust-building mechanisms and clear cost structures

CONCLUSION

Based on the Kruskal-Wallis analysis, it can be concluded that there are significant differences in the proportion of non-cash payment usage among MSME groups in Kampung Baru, both on the revenue side ($p < 0.001$; $H = 72.191$) and the expenditure side ($p < 0.001$; $H = 96.358$). These differences are not uniform and reflect the heterogeneity of transaction characteristics and supply chains of each business type.

This study also highlights the existence of transaction asymmetry. Some MSMEs (especially restaurants, grocery stalls, and street vendors) have adopted non-cash payments on the downstream side (customers) but still rely heavily on cash on the upstream side (suppliers). The practical implication of this finding is that non-cash payment facilitation should not be generalized. Policies must be tailored to the type of MSME. For the trade and culinary sectors, interventions must target the supplier ecosystem to accept digital payments.

This study has limitations as it was conducted in only one region (Kampung Baru) and used self-reported percentage data by business actors, which may be subject to recall bias. Future research is recommended to expand the geographical scope, include a larger sample size, and trace actual transaction data from payment service providers to obtain more objective measurements.

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