



Analysis of the Use of QRIS Transactions and Digital Literacy in Influencing the Income of Culinary MSMEs

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Abstract

The current research is exploring the impact of the QRIS transaction use and digital literacy on the revenue of culinary MSMEs in Makassar City. Based on primary data that constitutes structured questionnaires administered to 50 culinary MSME actors, multiple linear regression analysis will be used in the study to study both individual and combined effects of the variables. Based on the results, QRIS adoption and digital literacy indicated that these two variables have significant positive effects on MSME income. Further, when used simultaneously, these factors have synergetic effect on financial performance. The results indicate that, as QRIS offers an effective and safe transaction platform, it is of the best use when the operators are digitally literate enough to apply the technology to the greater business model. The research will help in MSME digitalization given that it highlights the synergetic nature of using payment technology with human capital capabilities. The implications propose that policy initiatives targeting to enhance the performance of MSMEs in the digital economies should be directed to both access and the enhancement of digital competencies of MSME actors.

Introduction

In today's digital era, the development of information technology has had a significant impact on various sectors of life, including the economic sector, especially on micro, small and medium enterprises (MSMEs). One of the important innovations that has developed in the payment system is the use of the *Quick Response Indonesian Standard* (QRIS), which has been introduced by Bank Indonesia as a national standard for payment transactions using QR Codes. QRIS allows business actors to accept payments digitally easily and efficiently (Anggarini, 2022; Rafferty & Fajar, 2022). The use of QRIS is seen as a solution to increase financial inclusion in Indonesia, especially for MSME actors who have limited access to the traditional banking system (Balqis et al., 2024; Rahmayati et al., 2023; Nisa & Adinugraha, 2024; Farrell et al., 2022).

The development of digital campaigns in Indonesia has made many people use non-cash payments such as QR Codes because they are considered more practical and efficient (Hendrawan et al., 2023; Amelia et al., 2023; Chohan et al., 2022). This has made many merchants such as ovo, funds, gopay, link aja create their own QRs. Therefore, Bank Indonesia standardized QR Codes so that with only one QR, namely QRIS, the QR Code can be connected to all existing merchants (Suardi, 2023; Yusril, 2023).

The number of QRIS merchants in South Sulawesi continues to increase. At the end of the second quarter of 2022, the number of QRIS in South Sulawesi had reached 628,865 merchants or grew by 174.3% (yoy) when compared to the position at the end of the second quarter of

2021. South Sulawesi's growth rate is still higher than the national growth of 148.8% (yoy). Of the 628,865 QRIS merchants in South Sulawesi, 45.27% of merchants are centered in South Sulawesi, followed by 8.78% in Gowa and Makassar Regencies; 5.10% in Pare-pare City; 4.68% in Wajo Regency and other areas in South Sulawesi have a share of below 4%. Until now, Makassar City is still the city with the highest use of Qris (Suardi, 2023).

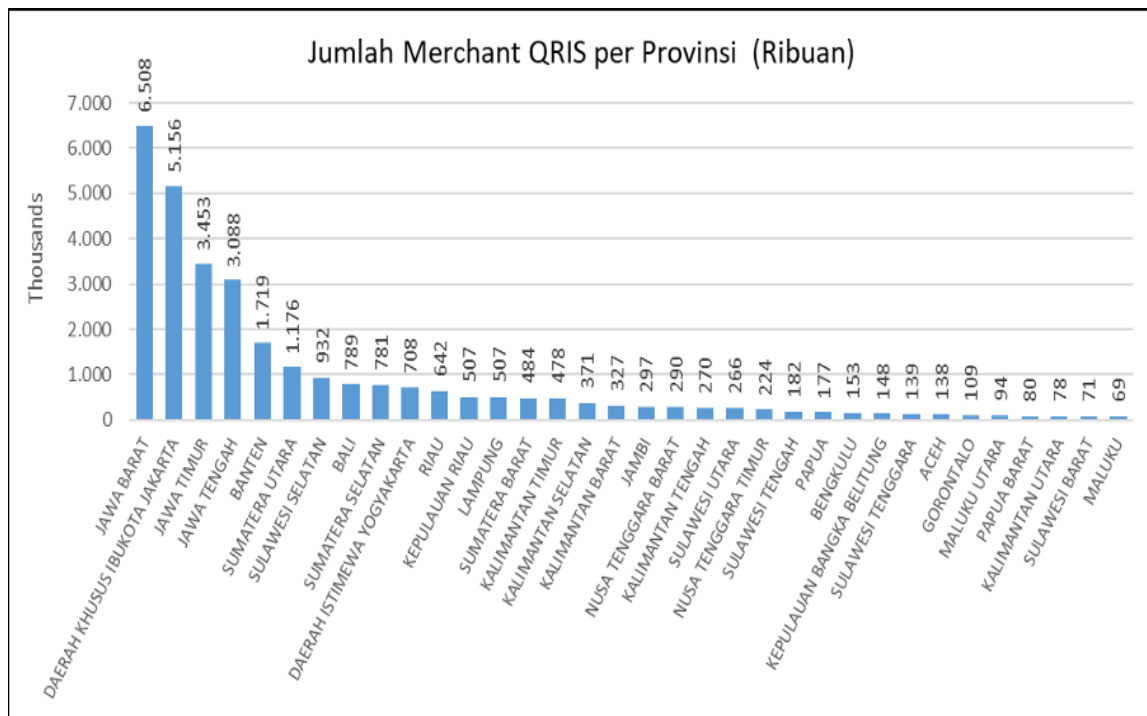


Figure 1. Number of QRIS Merchants per Province in 2023

Source: Bank Indonesia (2024)

Bank Indonesia noted that QRIS merchants in South Sulawesi in 2023 had reached 932,000 merchants, of which more than half were micro-enterprises. When compared to 2022, this figure increased from only around 628,865 merchants, there was an additional 303,135 new users from the previous year. This shows that the efforts made by Bank Indonesia in South Sulawesi by holding socialization and education of the digital payment system to MSMEs, traditional market traders, or the general public are considered successful.

The Bank Indonesia Representative Office of South Sulawesi Province also encourages the development of financial access, especially for MSMEs through various training, coaching, and mentoring (Surya et al., 2022; Rahman, 2015). The MSME financial access development program is also routinely carried out by the BI South Sulawesi Representative Office through SiAPIK to MSME actors and fostered clusters as well as facilitating financial access to banking. In addition, QRIS socialization and encouragement of QRIS use in MSME payment transactions are also continuously carried out through pentahelix collaboration. In addition, encouragement of QRIS use is also carried out from the consumer side. Bank Indonesia conducts QRIS Socialization and User Experience for High School/Vocational High School Students and students in several Regencies/Cities in South Sulawesi.

Meanwhile, digital literacy is also a very important aspect in facing the digitalization era. Digital literacy refers to an individual's ability to use information and communication technology (ICT) effectively and efficiently, including in the use of digital payment tools such as QRIS (Shehadeh et al., 2025; Trianto et al., 2025; Purbowo & Trinugroho, 2025). In this

context, MSMEs, especially those engaged in the culinary sector in Makassar City, are faced with the challenge of understanding and utilizing digital technology in their business transactions. MSMEs are forced to be able to immediately innovate and adapt, including by adopting a digital business model. Until now, there are 132 million internet users in Indonesia (Ariani & Nadapdap, 2023).

Culinary MSMEs in Makassar City have a very important role in the local economy, because they not only provide jobs, but also enrich the culinary diversity that attracts tourists. However, to survive and thrive amidst increasingly fierce competition, culinary MSMEs need to adapt to technological developments, especially in terms of accepting digital payments and increasing digital literacy.

Previous research conducted by Pinandita et al. (2023) stated that in practice, the use of QRIS from the side of MSMEs can be said to be effective and efficient because MSMEs have used QRIS as a payment method and actively offer QRIS as an alternative transaction to their consumers. The adaptation of QRIS use from the side of MSMEs which is reflected in the increase in income can be said to be effective and efficient because of the transparency of transactions, thus helping in financial recording and minimizing fraud from employees.

However, digital literacy is an important basis for improving an individual's ability to access, understand, and utilize information through digital technology (Rizkinaswara, 2020). Research conducted by Nurdien & Galuh (2023) states that there is a positive and significant influence between digital literacy and preferences for using QRIS BSI Mobile. The results of this study indicate that a good understanding of digital literacy can have an impact on increasing the use of *cashless*. Based on the background that has been explained previously, the researcher is interested in conducting research on the use of QRIS transactions and digital literacy in influencing the income of culinary MSMEs in Makassar City. Because the use of QRIS transactions and digital literacy both have goals or targets as expected, as well as QRIS which aims to make it easier for someone in terms of payment transactions. Based on the explanation above, the following research hypothesis arises:

H1: It is suspected that the use of QRIS transactions has a positive and significant effect on the income of MSMEs in Makassar City.

H2: It is suspected that digital literacy has a positive and significant effect on the income of MSMEs in Makassar City.

H3: It is suspected that the use of QRIS transactions and digital literacy together or simultaneously has a positive and significant effect on the income of MSMEs in Makassar City.

Methods

The descriptive quantitative research design was used in this study to investigate how quantity of QRIS transactions and degree of digital literacy affect the revenue of culinary MSMEs in the City of Makassar. The choice of a quantitative approach was deemed right in order to record connections between variables in a systematically way due to employing the statistical analysis, thus providing the objective and rededible comprehension of these movements.

The research target three main variables on which the study was based; which was the income of the MSME as a dependent variable, use of QRIS transactions and digital literacy as the independent variables. In the study, the population is culinary actors of MSMEs in Makassar City who had developed QRIS as one of their ways of making payments. Since the actual size of the population was not known and would probably be large, and was aware of limitation in terms of time and resources, the researcher adopted non-probability sampling method namely

purposive sampling. The purpose of the selection criteria involved the fact that the respondents should be active culinary MSME operators in the City of Makassar who had started using QRIS as a means of transaction in their business operations.

To obtain a good sample size with necessary representation, the study was guided by the prospects expressed by Roscoe (as cited in Sugiyono, 2018), saying that with an unknown population, a sample of between 30 and 500 is sufficient. Moreover, the minimum sample set was determined due to the calculation based on at least 25 times the number of independent variables according to Tamunu & Tumewu (2014). And since there were two independent variables modeled in it, the minimum sample requirement was consequently determined to be 50 respondents which agreed with the sample size chosen (i.e. 50 MSME actors).

Structured questionnaires used in the primary data collection are meant to provide measurements on the use of QRIS transactions and the level of digital literacy, as well as the difference in the actual income of MSME. Perceptions of the respondents were captured using a five-point likert scale where the strongest disagreement and strong agreement were marked. No questionnaire is left without a strict testing in order to especially certify its validity and reliability, therefore, it was established that the items throughout the questionnaire have successfully measured the desirable constructs as well as demonstrated internal consistency.

After collection of the data, they were analyzed using SPSS version 20. First, validity and reliability of the instruments was established through suitable tests of statistics. Before the regression analysis, numerous classical tests of assumptions have been conducted so as to verify the strength of the model. To check the normality of the residuals, Normal Probability plot was deployed to verify that the information conformed to normal distribution. The multicollinearity was checked by computing Tolerance and Variance Inflation Factor (VIF) where the correlation of independent variables had to be kept within the doable limits. Heteroscedasticity was checked by looking at scatterplots of residuals, whereas the Durbin-Watson statistic helped reveal whether there was an autocorrelation present or not.

Having ensured that the data satisfied the required assumptions, a multiple linear regression analysis was conducted to understand how QRIS usage and digital literacy affected the income of MSMEs. The method allowed the researcher to assess the individual (part) outcome of each of the independent variables as well as the overall (combinatory) outcome of the same variables on income outcomes. The hypothesis testing was done with t-tests on partial significance and F-tests on joint significance to have a clear idea of the role of each of the factors in the variations in the income that had been observed. Besides, the coefficient of determination (R^2) was calculated to determine the goodness of the independent variables explaining the variance in MSME income, providing an additional clue on the extent to which the model is powerful.

Result and Discussion

Classical Assumption Test

Normality Test Results

The data normality test is used to determine whether the number of samples taken is representative or not, the research conclusions taken from the number of samples can be accounted for. The normality test in this study uses the Normal Probability Plot Test. The test results are as follows:

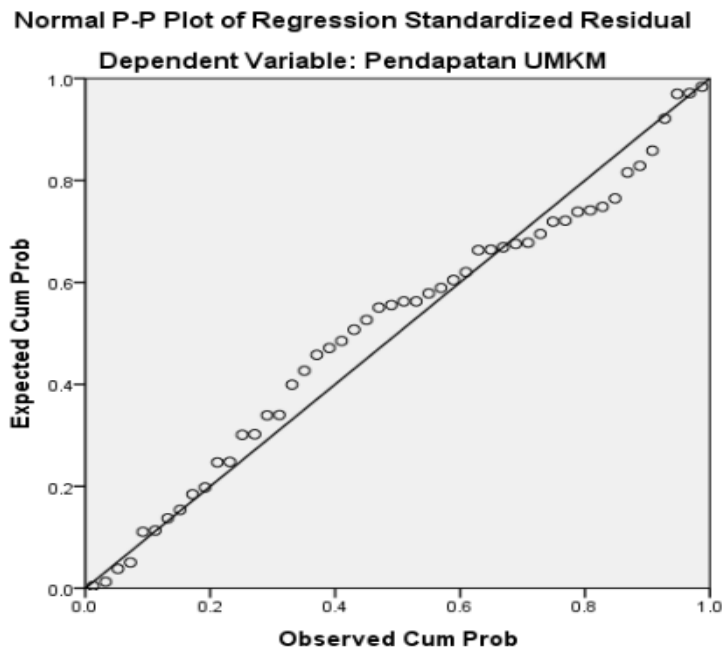


Figure 2. P-Plot of Normality Test

Based on the results of the normality test in the figure, it can be seen that the relationship between the Use of QRIS Transactions (X_1), Digital Literacy (X_2), and MSME Income (Y) shows a normal distribution pattern where the data is spread around the diagonal line, this indicates that the regression model has met the normality assumption test.

Multicollinearity Test Results

Multicollinearity to test whether a regression model has a correlation between independent variables. A good regression model should not have a correlation between independent variables. To detect the presence or absence of multicollinearity in the regression model, it can be done by looking at Tolerance and VIF (Variance Inflation Factor) Tolerance Measures the results of selected independent variables that are not explained by other independent variables. So, a low Tolerance value is the same as a high VIF (because $VIF = 1 / \text{Tolerance}$). The cut off value commonly used to indicate multicollinearity is the tolerance value equal to the VIF value ≥ 10 .

Table 1. Multicollinearity Test Results

Model	Variables	Tolerance	VIF	Results
$X_1 \rightarrow Y$	Use of QRIS Transactions	0.557	1,795	There is no multicollinearity
$X_2 \rightarrow Y$	Digital Literacy	0.557	1,795	There is no multicollinearity

Source: Data Processed by Researchers (2025)

Heteroscedasticity Test Results

The heteroscedasticity test aims to test whether in the regression model there is inequality of variance from the residuals of another observation. The presence or absence of heteroscedasticity can be seen from the presence or absence of a certain pattern in the scatterplot graph. If there is a certain pattern such as dots that form a certain regular pattern (wavy, widening, then narrowing) then it indicates that heteroscedasticity has occurred.

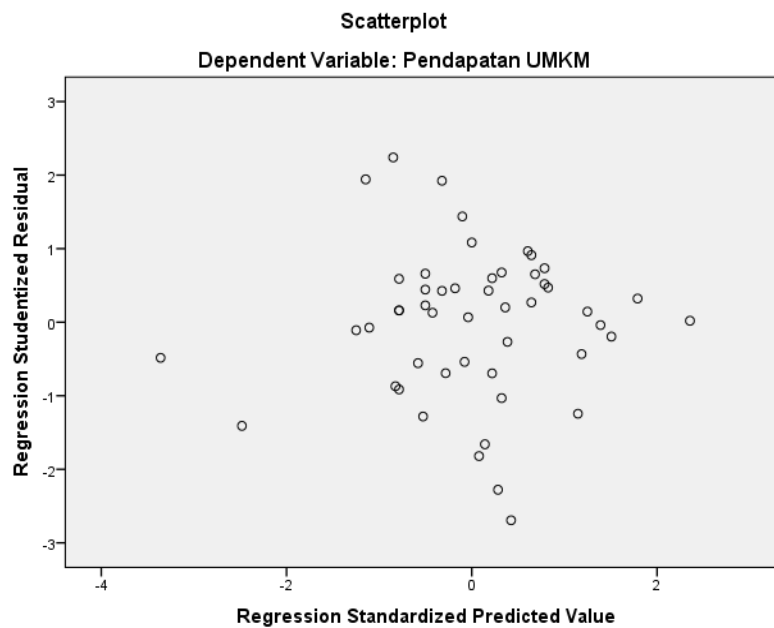


Figure 3. Scatterplot Heteroscedasticity Test Results

Based on the results of the multicollinearity test, it can be seen in the Scatterplot that the points are spread randomly both above and below the number 0 (zero) on the Y axis and there is no clear pattern in the distribution of the data. This shows that there is no heteroscedasticity in the regression model. So this regression model has met the heteroscedasticity assumption test.

Autocorrelation Test Results

The autocorrelation test aims to test whether in the linear regression model there is a correlation between the disturbing errors in the previous period $t-1$. If there is a correlation, then it is called an autocorrelation problem. To detect autocorrelation in this study, the following Durbin Watson (DW) test is used:

Table 2. Autocorrelation Test Results

Sample	Variables	Durbin Watson Values
50	Use of QRIS Transactions, Digital Literacy	1,867

Source: Data Processed by Researchers (2025)

Based on the results of the autocorrelation test, the Durbin Watson value (d) is 1.867. This value will be compared with the table value using a significance of 5%. The number of samples (n) is 50 and the number of independent variables (k) is 2. So from the table, the value of $dU = 1.6283$, and the value of $dL = 1.4625$. Therefore, the value of $dU < d < 4 - dU$ or $1.6283 < 1.867 < 2.3717$, it can be concluded that there is no autocorrelation in the data.

Research Hypothesis Test Results

t-test (Partial test)

The t-test aims to determine the influence between the independent variables and the dependent variables partially. This test is to determine whether there is a significant influence of each independent variable, namely: Use of QRIS Transactions and Digital Literacy on MSME Income, then the significance value of t is compared with its degree of confidence. If $\text{sig } t$ is greater than 0.05 then H_0 is accepted. Likewise, conversely if $\text{sig } t$ is less than 0.05 then H_0 is

rejected. If H_0 is rejected, this means that there is a significant relationship between the dependent variables.

Table 3. t-Test Results

Variables	t count	Significance
Use of QRIS Transactions (X1)	3,718	0,001
Digital Literacy (X2)	3,468	0,001

Source: Data Processed by Researchers (2025)

Based on the t-test results table above, it can be interpreted as follows:

The results of the t-test of the influence of the variable of QRIS Transaction Use on MSME Income presented in the table obtained a calculated t value of $3.718 >$ from t table 1.677 and a significance value of 0.001. The significance value is less than 0.05 ($\alpha = 0.05$), so H_a is rejected and H_0 is accepted. This means that the use of QRIS transactions has a positive and significant effect on MSME Income.

The results of the t-test of the influence of the Digital Literacy variable on MSME Income presented in the table obtained a calculated t value of $3.468 >$ from t table 1.677 and a significance value of 0.001. The significance value is less than 0.05 ($\alpha = 0.05$), so H_a is rejected and H_0 is accepted. This means that Digital Literacy has a positive and significant effect on MSME Income

F Test Results (Simultaneous)

The F test basically shows whether all independent variables intended in the model have a simultaneous influence on the dependent variable to make a decision on whether the hypothesis is accepted or rejected by comparing the significance level (alpha) of 5% (0.05). If the probability F value is greater than alpha 0.05, the regression model cannot be used to predict the dependent variable, in other words, the independent variables simultaneously have no effect on the dependent variable. Conversely, if the probability F value is smaller than alpha 0.05, it can be said that the independent variables simultaneously have an effect on the dependent variable.

Table 4. F Test Results

Variables	F count	Significance
Use of QRIS Transactions	38,595	0,000
Digital Literacy		

Source: Data Processed by Researchers (2025)

From the results of the F Test in table 4, it can be seen that the calculated F value is 38.595 while the F table value is used in the F table statistics appendix. Calculating the F table with numerator $dk = k$ (number of independent variables) and denominator $dk = (nk-1)$ with an error rate of 5% (Sugiyono, 2020). From this formula, the numerator $dk = 2$ and the denominator $dk = 50 - 2 - 1 = 47$ are obtained, using a significance of 0.05, the F table is 3.20.

This shows that $F \text{ count} > F \text{ table}$, namely $38.595 > 3.20$, then H_a is rejected and H_0 is accepted, meaning that the use of QRIS transactions and Digital Literacy together have an effect on MSME income.

Multiple Linear Regression Analysis

Multiple Linear Regression Equation Test Results

The analysis technique used in this study is the multiple linear regression analysis technique. Multiple regression analysis is used as a statistical analysis tool because this study is designed to examine the variables that influence the independent variables on the dependent variables where the variables used in this study are more than one.

Table 5. Results of Multiple Linear Regression Equation Test

Variables	Regression Coefficient Value
Constantine	-0.737
Use of QRIS Transactions	0.840
Digital Literacy	1,073

Source: Data Processed by Researchers (2025)

Based on the results of the multiple linear regression equation test table above, it can be interpreted as follows: a) Constant Value (a) The constant value is -0.737. This means that the value of the MSME Income variable (Y). The QRIS transaction usage and digital literacy variables are considered constant; b) The regression coefficient of the variable Use of QRIS transactions (X1) is 0.840, which states that there is an influence between the Use of QRIS transactions and MSME Income, if the Use of QRIS transactions is better, the MSME Income will increase positively. This means that every time the use of QRIS transactions (X 1) increases by 100 percent, MSME income will increase by 84 percent and vice versa; c) The regression coefficient of the Digital Literacy variable (X2) is 1.073, which states that there is an influence between Digital Literacy and MSME Income. If Digital Literacy (X1) improves by 100 percent, MSME Income will increase by 108.4 percent and vice versa.

Results of the Determination Coefficient Test (R²)

This determination coefficient test is carried out with the intention of measuring the model's ability to explain how much influence the independent variables together (stimulus) influence the dependent variable which can be indicated by the *R-Squared value*. The determination coefficient shows the extent to which the contribution of the independent variables in the regression model is able to explain the variation of the dependent variable. The determination coefficient can be seen through the *Rsquare value* (R²) in the *Model Summary table*.

Table 6. Results of the Determination Coefficient Test (R²)

R	R Square
0.788	0.622

Source: Data Processed by Researchers (2025)

From table 4.19, the coefficient value of determinant R = 0.788 is obtained, which shows the level of relationship between the Use of QRIS Transactions and Digital Literacy on MSME Income. While R square (R²) is obtained at 0.622, which means that the influence of independent variables consisting of the Use of QRIS Transactions and Digital Literacy on MSME Income is 0.622 or 62.2 %. While 0.378 or 37.8 % is influenced by other variables not examined in the study.

The Impact of Using QRIS Transactions on MSME Income

The findings of this research illustrate that the adoption of QRIS transactions statistically positively influences the income of the culinary MSMEs in the Makassar City. This conclusion affirms the fact that MSMEs that are directly embracing QRIS ways of payment are likely to record a higher level of income as opposed to those that are still using traditional cash

payments. The entry of QRIS also presents many benefits to the operators of the MSMEs specifically in terms of being efficient in transactions and expanding the markets that they are offering their products and services. QRIS ensures the ease of payment using the electronic medium across multiple channels (e.g., mobile banking applications, digital wallets, and electronic data capture (EDC) machines), thereby removing major barriers to transaction, which hinder customer convenience, in the past (Sudyantara & Yuwono, 2023; Chohan et al., 2022). Practically, this does not only speed up the payment system but also improves the level of customer experience into becoming more professional and as such, heightened customer satisfaction and possible repeat customers.

Besides, the deployment of QRIS helps businesses with small and medium enterprises minimize their operational costs by eliminating the unnecessary installations of costly EDC systems or duplication of existing payment terminals, which is especially important to the micro and small firms running on low capital (Amelia et al., 2023). Also, higher transparency and accuracy afforded by QRIS enable MSMEs to keep a clearer account of their finances, minimize the instances of fraud of human origin, and facilitate better-informed financial management choices (Pinandita et al., 2023). Strategic implementation of QRIS in accordance with Resource-Based Theory (RBV), can therefore be seen as a kind of intangible resources, which increases competitiveness and long-term financial sustainability of an MSME (Farrell et al., 2022).

The results of this research are consistent with the activities of Cahyani (2024), who recorded that MSMEs that have implemented QRIS show growth of ten percent to fifteen percent of their daily expenses, especially at the weekend, or during promotion. The correlations between income and QRIS adoption are positive, which can partly be explained by the fact that QRIS allows MSMEs to receive more customers who want or are in need of digital transactions, which are more popular among younger and more technologically savvy populations that might also not want to go to cash-centric business establishments (Anggarini, 2022; Hendrawan et al., 2023). This is especially considering Indonesia where within the population of digital consumers who are over 132 million internet consumers, they are gradually developing digital consumption habits (Ariani & Nadapdap, 2023), thus necessitating the rise in the demand of cashless payment systems.

Moreover, this finding is consistent with a larger countrywide trend whereby the QRIS awareness development activity launched by Bank Indonesia has had its successes in promoting the growth in both merchant coverage and, especially, the trend in the adoption of QRIS among micro-enterprises in the region, including South Sulawesi (Suardi, 2023). Since the QRIS merchants have rapidly increased (more than 174 percent in the area between 2021 and 2022), MSME engagement in digital payment environments has been stimulated as well. This accessibility has given culinary MSMEs to reach a broader consumer base that they might initially inhabit, not just with food delivery apps but also in online-to-offline (O2O) environments that focus on digital payment systems (Rafferty & Fajar, 2022; Putra, 2024).

Also, there is international evidence that proves the same: a survey conducted by Putit & Sahudin (2023) discovered that developing countries MSMEs who have implemented a mobile and QR-based payment solutions have experienced not only an increase in revenue but a more noticeable improvement in the consequences of financial inclusion. Likewise, Minarni (2025) conducted a study in the *Journal of Business Research* and revealed the fact that the acceptance of digital payments in the context of small businesses leads to the growth of customer loyalty and customer bases, especially the ones trading in competitive markets in cities.

Nevertheless, although it is obvious that QRIS adoption can be helpful, it is necessary to mention that the scale of its effects also depends on multiple complementary characteristics, including the level of digital literacy of MSME operators, their customers having to be promoted to use the option of digital payment, and the extent of interconnection with e-commerce and delivery systems (Rahmayati et al., 2023; Mahesh et al., 2022). To acquire maximum financial benefit, MSMEs entering digital marketing and online sale platforms will maximize their gains by combining their QRIS adoption strategy (Nisa & Adinugraha, 2024; Yuldinawati, 2025; Setyawati et al., 2023).

Digital literacy and its impact on the income of MSMEs

Findings of this research show that there is a positive and statistically significant correlation between digital literacy and MSME income at the culinary sector in Makassar City. This implies that those MSMEs that are characterized with greater digital literacy continually record improved financial performance than their counterparts who have low digital competencies. The skills related to digital literacy provide operators of MSMEs with the capacity of more efficient use of various information and communication technologies (ICTs), which influences business processes, marketing levels and interaction with customers. In the time of digitalization that influences consumer preferences and market trends, the ability to use digital tools becomes a necessity in regard to MSME sustainability and growth (Rizkinaswara, 2020; Effendi et al., 2023; Jurnalita, 2024; Gao et al., 2023).

It is line with other similar studies by Nurdien & Galuh (2023), where the study revealed digital literacy has a positive effect on the preference of using mobile-based financial technology, which in this case is QRIS, thus boosting the cashless transaction volumes. In the same sense, Effendi et al. (2023) added that digitally literate MSMEs increase their level of competitiveness by empowering entrepreneurs to take advantage of the digital marketing avenues, financial management, and reach wider markets via e-commerce platforms. Within the scope of the present study, a wide variety of culinary MSME actors in Makassar denied not using digital platforms like Instagram, Facebook, GoFood, ShopeeFood, and WhatsApp Business to market their services, maintain a relationship with customers and increase sells all of which require certain levels of digital literacy as a prerequisite.

Digital literacy is not only useful in marketing and sales. It leads to improved financial record-keeping, accessing online financial services and enables MSMEs to interrogate customer data to make strategic decisions (Amelia et al., 2023). Researchers have indicated that digital literacy has a positive relationship with entrepreneurial behavior since it improves mental processes to search, evaluate, and implement digital information in a productive way (Van Deursen & van Dijk, 2014). This is supported by the current results that demonstrate that MSMEs that possess a higher level of digital capabilities can more effectively use digital payment systems, such as QRIS, online markets, and digital banking facilities, which ultimately increases the level of total income they have.

In addition, the association between digital literacy and income generation is very keen with Technology Acceptance Model (TAM) which connotes that the perceived usefulness and ease of using new technologies play a significant role in determining the intention a particular person has towards the adoption of new technologies (Davis, 1989). Actors in MSME who possess higher digital literacy will find the adoption of digital tools to be more valuable and thus will actually adopt it and enjoy financial benefits (Farrell et al., 2022; Rizki & Hendarman, 2024; Raj et al., 2024; Harnida et al., 2024). This dynamic hold specifically well in the following context as shown in the culinary industry in the Makassar City which is in a rapid

process of digitization and consumers feel the need to engage in digital activities and the MSMEs in the culinary industry need to get with the trends to be able to stay competitive.

The findings are also indicative of wider trends spotted in worldwide research. As one example, an OECD (2021) survey of Southeast Asian MSMEs established that the fact that enterprises with more digital capabilities experienced higher revenues did not only concern the fact that they were more resilient during economic shocks, but also in the face of the COVID-19 pandemic, which tied the faster pace of digital adoption in every sector. This strength is gained by the flexibility that digital tools provide, allowing MSMEs to immediately shift to online selling channels, adjust pricing policy, and keep customers relationships in case of the market upset.

Nonetheless, it is all the more important to note that digital literacy cannot automatically impact the increased income unless it is combined with the strategic use. MSMEs should be equipped with more than just technical abilities to use digital tools but also a way of thinking that is endeavoring to capitalize on them (Balqis et al., 2024; Ullah et al., 2023). Policymakers and development agencies should hence, develop interventions that are more comprehensive than simply teaching basic digital literacy skills including developing more competencies in the digital business strategy, online marketing, and decision-making through data.

The effects of jointly using QRIS transactions and digital literacy on the MSME income

This research findings indicate that the combined synergistic effect of using QRIS transactions and digital literacy has a large positive impact on the income of culinary MSMEs in the City of Makassar. Such an exchange highlights the fact that technological adoption on its own does not necessarily lead to better financial performances. Instead, the adaptation of MSME actors regarding the ability to comprehend, control and incorporate digital payment technology into larger business operations is important to ascertain the level to which digital payment technologies promote the growth of income. This observation is in line with previous studies, which suggest that although digital payment systems, such as QRIS, can improve the efficiency of transactions and increase market outreach (Sudyantara & Yuwono, 2023; Cahyani, 2024), they have the most significant effect when used by people with adequate digital competencies (2023; Effendi et al., 2023; Nurdien & Galuh, 2023).

In this respect, the current results can be correlated with the Technology Acceptance Model (Davis, 1989) that focuses on the parameters of perceived usefulness and user competence regarding the outcomes of technology adoption. They also have some echo with the statement of the Resource-Based Theory (Farrell et al., 2022), according to which human and technological resources are presented as mutually complementary assets, which should be built simultaneously to provide competitive advantage. It is specifically in the local context of the Makassar City region, where MSME businesses are presented with a dynamic and competitively charged business landscape, that companies that have managed to integrate QRIS with strong digital literacy practices seem better positioned not only to utilize digital mediums, to streamline customer experiences, and to adjust operations to accommodating and responding to shifting consumer demands to utilize digital forms of payment (Suardi, 2023).

In addition, the combined effect of the QRIS use and digital literacy can be especially important in such industries as culinary MSMEs, where the differentiation of the products and services may be minimal, and customer loyalty can be an issue of the quality of service, the convenience of delivery, and modern payment experiences (Chohan et al., 2022; Shabani et al., 2022; Susiang et al., 2023; Prasetyo et al., 2021). That digital transactions become integrated-and

also that digital marketing and communication tools are efficient, is therefore, one of the avenues available to this sector to increase income.

However, it is also necessary to bear in mind that this synergistic outcome is not even across the board of all MSMEs. These data indicate that the extent to which the QRIS adoption can be associated with the increase in income is mediated by the differences in the levels of individual digital literacy, the maturity of the business, and the market positioning. As highlighted by Balqis et al. (2024), structural factors such as internet infrastructure, consumer digital readiness, and institutional support also play a moderating role, suggesting that technological adoption remains embedded within broader social and economic contexts.

Conclusion

Based on the results of this study, it can be concluded that both QRIS transaction usage and digital literacy individually and jointly exert a significant and positive effect on the income of culinary MSMEs in Makassar City. MSMEs that implement QRIS payment systems benefit from more efficient, secure, and transparent transaction processes, which in turn foster greater customer engagement and higher sales volumes. Likewise, MSMEs with stronger digital literacy are better equipped to leverage digital platforms, manage financial data, and engage customers through online channels, all of which contribute to improved income performance. Importantly, the combined adoption of QRIS and the cultivation of digital literacy amplify these income effects, suggesting that the integration of technological tools with human capital capabilities is key to optimizing MSME financial outcomes. These findings point to the necessity of promoting not only technological adoption among MSMEs but also parallel efforts to enhance digital skills. Policy interventions that address both dimensions are more likely to yield sustainable improvements in MSME competitiveness in the digital economy. Furthermore, given the sectoral focus on culinary MSMEs, which operate in fast-paced, consumer-facing environments, these insights may inform targeted support strategies for similar MSME segments in other urban contexts.

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