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Understanding payment switching behavior to QRIS in Southwest Papua: A push-pull-mooring study

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Abstract: As the global economy changes, it's important to examine why people in Southwest Papua switch from cash to the Quick Response Code Indonesian Standard (QRIS) system. This region is notoriously behind in infrastructure and human development, so studying this area is crucial to expanding the national economy. This study investigates the variables that influence the switching behavior of users in Southwest Papua toward the Quick Response Code Indonesian Standard (QRIS) digital payment. The study investigates the impact of push factors (e.g., perceived trouble, perceived no record for transactions, and difficulty paying cash in large amounts), pull factors (e.g., perceived convenience, promotional benefits, and time savings), and mooring factors (e.g., habit and switching costs) on the transition from cash to digital payments, utilizing the Push-Pull-Mooring (PPM) framework and transaction cost theory. The research uses a method called structural equation modeling to study how QRIS users behave in three areas of Southwest Papua Province: Sorong City, Sorong Regency, and Raja Ampat, by selecting participants randomly from different groups. The results indicate that the adoption of QRIS is significantly influenced by both push and pull factors, with pull factors playing a more prominent role. Habit also significantly influences switching behavior, while switching costs show a negative but statistically insignificant effect. To expedite the adoption of digital payments in Southwest Papua, these insights provide policymakers and financial institutions with practical advice. They indicate that strategies that emphasize the convenience and advantages of QRIS over cash are more effective in increasing user adoption.

Keywords: Push-Pull Mooring; Switching Behaviour; Digital Payment; QRIS
JEL Classification: M21; J3; E42

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Introduction

To improve efficiency, inclusiveness, and creativity, digital transformation is very vital worldwide. By providing quicker, safer, and more easily available financial transactions across various industries and communities, digital payment systems help to facilitate this change. Bank Indonesia (BI) continues to develop the Quick Response Code Indonesian Standard (QRIS) digital payment system, which has been proven to support the MSME digitalization program in terms of business

speed and efficiency of non-cash transactions (Puslitbang Aptika & IKP, 2019). The creation of a long-lasting digital payment system is consistent with Indonesia's intention to introduce the Digital Rupiah. Indonesia can accomplish this goal and promote the digitalization of the regional - national economy by implementing the QRIS digital payment system (Mulyono, 2022).

Formed in December 2022, Southwest Papua is a region that was split off from the province of West Papua. It consists of five regencies and one city. In 2023, the Gross Regional Domestic Product (GRDP) amounted to 36.10 trillion rupiah (Antara Papua Barat, 2024). Based on data from the Central Statistics Agency, Sorong City, as the provincial capital, received the highest income at 46.28 percent (BPS Papua Barat, 2023). Table 1 shows the GRDP information for each city or district.

Table 1 GRDP of Southwest Papua Province

Name of Districts/City	% GRDP 2023
Sorong City	46.28
Sorong Regency	33.08
Raja Ampat Regency	11.46
South Sarong Regency	6.19
Maybrat Regency	2.23
Tambrauw Regency	0.75

Source: BPS (2023)

The information shown above describes that the economy centers on Sorong City, Sorong Regency, and Raja Ampat Regency. Sorong City, known as the commercial hub, has more transactions than other areas, including household consumption, business, and government. Research by Hidayah et al. (2023) clarifies the phenomenon of consumers in Sorong City who are used to using cashless payment methods of EDC machines and QRIS, which encourages business actors to adapt. Bank Indonesia reported 54,690 QRIS users in West and Southwest Papua, up 31,000 from 2023, supported by Bank Indonesia's digital payment literacy program. Raja Ampat Regency, as a popular tourist destination, is encouraged to transform by using QRIS for its tourism business actors.

The push-pull-mooring framework, originally developed for migration studies, has been applied to examine switching behavior in consumer services including payment siystems. Push factors are usually high transaction fees, risk and trouble concerns, and convenience issues that drive users to switch payment methods. Conversely, pull factors are digital payment system features like ease of use, benefits, and rewards programs that encourage users to switch (Verhoef et al., 2021). Mooring factors act as moderating influences, which can either facilitate or hinder the switching process (Monoarfa et al., 2023). Synthesizing the insight from transaction cost theory with the PPM framework allows a comprehensive analysis of the motivations behind consumers' transitions to digital payment systems like QRIS. This approach highlights both the social and psychological dynamics behind consumers' decisions. In the context of Southwest Papua Province, empirical evidence from this research is expected to help develop non-cash payment systems, especially in Southwest Papua Province, where the Central Authority is still promoting electronic and

digital payment to achieve transparency and accountability (Wijaya & Ahmad, 2023). It can also help businesses, financial institutions, payment system policymakers, and local governments develop digital payment mechanism strategies and policies. In addition, this research is expected to contribute to the literature reference in efforts to increase the number of new users across various user sectors, as well as support the national discourse for the acceleration of regional economic digitalization. A recent study by Munifatussaidah et al. (2024) explains that digital adoption significantly moderates the impact of Islamic social fund distribution on regional economic development in Indonesia, with greater digital access enhancing fund effectiveness, especially in provinces with lower income inequality.

Transaction Cost Theory was developed by Roland Coase in 1937, which explains that transaction costs are the costs that arise in conducting exchanges, such as the cost of searching for information, negotiating, monitoring, and enforcing contracts. In this context, the application of transaction cost theory is relevant because it explains how individuals and organization choose methods to minimize such costs. Digital payment systems, including QRIS, will significantly reduce such costs, making them more attractive to users. As digital payments that offer benefits such as lower fees, faster processing times, and increased convenience can strongly influence consumers' adoption of these new payment technologies, according to research (Dahlberg et al., 2015). By integrating transaction cost theory into the push-pull-mooring factor framework, scholars can better understand the dynamics of consumer behavior in the digital payment landscape. (Lin & Huang, 2023) PPM theory by Bansal et al. (2005) explains service industry user migration theory, which includes push, pull, and mooring factors. It was initially explained by Moon (1995) that the push effect is the force that drives people away from a place, while the pull effect is the force that attracts people to a destination (Sugandha & Indarwati, 2021). In this research analogy, push factors are the elements that encourage users to switch from their previous payment methods to the QRIS digital payment method, while pull factors are the elements that can attract users to transition to using QRIS digital payment. Moon also integrated the "mooring" effect into migration behavior and created the push-pull-mooring model. The mooring effect helps and hinders behavioral migration. In this research analogy, the mooring factor affects switching behavior or moderates push-pull factors on QRIS digital payment users.

Several studies related to switching behavior, as well as digital payment adoption, have been conducted at the local level by Hidayah et al. (2023), and in various countries by Sasongko et al. (2021), Gunawan et al. (2023), Lim et al. (2020). It was found that in problem-solving approaches, the variables measuring switching intention and behavior are dimensions/indicators of the Theory of Planned Behavior, the Theory of Reasoned Action, or the Technology Acceptance Model. Sahi et al. (2021) describe Status Quo Bias Theory, Self-Determination Theory, and the Unified Theory of Acceptance and Use of Technology (UTAUT), which measure perceived usefulness, ease of use, attitude, satisfaction, demographic factors, socioeconomic status, emotional attitude toward digital products, and personality.

The PPM framework has been widely used to study consumer switching behavior across digital payment systems, mobile apps, and e-commerce platforms. Wiyata (2023) examined QRIS payment system adoption in Surakarta's traditional market and found that dissatisfaction, ease of use, critical mass, and switching costs drive switching behavior, but transaction inconvenience does not. Wijayanti & Kusumawardhani (2023) found that push and pull factors positively influence switching intentions on Tokopedia, while the mooring factor—subjective norms and variety-seeking behavior—has a less significant impact. An investigation into mobile instant messaging (MIM) applications conducted by Sun et al. (2017) revealed that user fatigue with incumbent apps and social norms are the driving forces behind switching, whereas switching costs and habits are the obstacles that prevent switching. Privacy concerns and monetary rewards were identified as the primary motivators in mobile payment applications by Wang and Peters (2023). Pull factors like perceived convenience and time savings drive mobile payment adoption more than push factors in areas with established financial infrastructure, according to Lu and Wung (2021). Furthermore, Yunita and Mintarto Munandar (2023) examined Generation Z in Jakarta and revealed that pull and mooring factors substantially affect e-wallet switching intentions, while push factors exert negligible influence. Finally, Ye et al. (2022) investigated e-commerce live streaming (ELS) users, revealing that switching intentions are influenced by dissatisfaction, privacy concerns, and the appeal of alternatives, while mooring factors like social influence and inertia moderate these dynamics. These studies collectively demonstrate the intricate relationship of economic, psychological, and social factors in digital platform switching behavior. However, research on QRIS switching behavior in southwest Papua Province is still limited. Most past research has concentrated on urban areas or places with advanced infrastructure, leaving a gap in empirical data from economically growing areas such as Southwest Papua.

This study addresses this gap by focusing on QRIS adoption and switching behavior in Southwest Papua by specifically analyzing push and pull factors through transaction cost theory and introducing mooring factors such as habis and switching cost. The study also addresses the need for greater understanding of digital payment systems in regional settings where conventional cash payments are still common. Understanding the elements driving change to QRIS is especially important for Sorong City as the business hub and Raja Ampat as a tourist destination since stakeholders trying to promote inclusive financial digitization would find it beneficial.

In this study, the author emphasizes more specific elements or the dimensions of push and pull factors that are more suited to this research. Building on the study by Lu and Wung (2021) study on users switching from conventional to mobile payment methods is more relevant to this research environment because it matches the phenomena in the author's study location. In addition, Lu and Wung (2021) examined the direct relationship between habit and switching intention. Thus, this study extends their approach by positioning habit and switching cost as mooring factors, aiming to support digital transformation efforts in Southwest Papua.

Lu and Wung identify several push factors that drive consumers away from cash payment, including perceived trouble (PT), which means the inconvenience of using cash, calculating change, and carrying a wallet. Next is Perceived No Record (PNR), which refers to the lack of transaction records, and Difficulty Paying in Large Amounts of Cash (DPLA), wich means that customers sometimes struggle to pay for expensive items in cash. Consumer issues with traditional payment methods are closely related to perceived trouble. Transaction delays, hidden fees, and lack of transparency can negatively impact consumer experience, according to studies (Kumar & Reinartz, 2016). Consumers are pushed to use mobile payments by this perceived inconvenience (Wang & Peters, 2023). On the other hand, the pull factor variable adopted from Lu and Wung (2021) in this research are perceived convenience (PT) as the comfort that is one of the characteristics of mobile technology that can influence attitudes and desires, perceived benefit (PB) as a factor that can attract customers to use mobile payment due to the bonuses or points offered, and save time (ST), meaning that customers believe that saving time reduces transaction costs because it can be done anytime and anywhere. Research consistently shows that perceived convenience and benefit strongly predict switching intention. A COVID-19 pandemic study found that dissatisfaction with traditional payments and the perceived benefits of mobile payments positively influenced switching intention (Mu & Lee, 2022). Another study conducted in Surabaya found that convenience and benefits increased consumer interest in digital financial services (Wibowo & Dermawan, 2023).

To deepen the analysis, habit (Ht) and switching cost (SC) as mooring elements are used to strengthen the study. Orbell et al. (2001) explain that the dimension of habit (Ht) is described as a behavior that will be performed automatically (Limayem et al., 2007), while switching cost is defined as all things that make customers reluctant to switch service providers, which is the cost of switching (Jones et al., 2000). Consistent with Lu and Wung (2021), this study indicates that habit can either support or hinder switching intention. Given Southwest Papua's continued cash dominance, habit is expected to be a major push anchoring element against digital change. Habitual use of traditional payment methods creates inertia that slows digital payment system adoption. Inertia acts as a strong mooring factor, inhibiting push effects to change consumers' payment methods (Bansal et al., 2005). Due to the familiarity and convenience of cash, consumers may resist switching (Wiyata, 2023), while the perceived switching costs, including search, transaction, and learning costs; discounts for loyalty; custom; emotional costs; cognitive effort; and social influence from others, make them reluctant to switch (Wiranatakusuma & Latief, 2024). Prior research confirms that switching costs significantly moderated the relationship between push factors (such as dissatisfaction with system quality) and switching intention (Fan et al., 2021). Research also shows that mooring factors moderate pull factors' effect on switching intention. A study on e-grocery shopping found that switching costs acted as a mooring factor that made alternative payment methods less appealing, reducing the positive effects of pull factors like perceived ease of use and perceived value (Monoarfa et al., 2023). Eventually, habits and switching costs will affect both push and pull factors separately, which might influence consumers' switching intention to digital payments. Based on the discussion, the following hypotheses are proposed:

H_1: *Push factors significantly affect the switching behavior of users towards QRIS digital payment.*

H_2: *Pull factors significantly affect the switching behavior of users towards QRIS digital payment.*

H_3: *Habit as push mooring factor will significantly affect the user's switching behavior.*

H_4: *Habit as a mooring factor moderates the relationship between push factors and switching behavior.*

H_5: *Switching cost as a pull mooring factor will significantly affect the user's switching behavior.*

H_6: *Switching cost as a mooring factor moderates the relationship between pull factors and switching behavior.*

Research Method

Research Measurement Model

The PPM theory creates structural models for path analysis to test predictor variable relationships by specifying their dimensions. Using a literature review of previous studies, theoretical perspectives, and phenomena, researchers determine manifest predictor variables or dimensional/indicator variables for the outer model of SEM-PLS analysis. To study phenomena using PPM theory, constructs must be specified to explain how variables are connected, measured, and defined (Nimako et al., 2013). The measurement model for the first-order constructs (perceived trouble, no record, difficulty paying cash in large amounts, habit, switching cost, perceived convenience, perceived benefit, and saving time) and the second-order constructs (push and pull factors) was reflective. This study explains different variable positions. Hypotheses are used to explain variable positions (Sugiyono, 2013). Variables (push, pull, and 2 mooring factors) with 6 dimensions and 1 endogenous variable of switching behavior are used, as explained in the Figure 1.

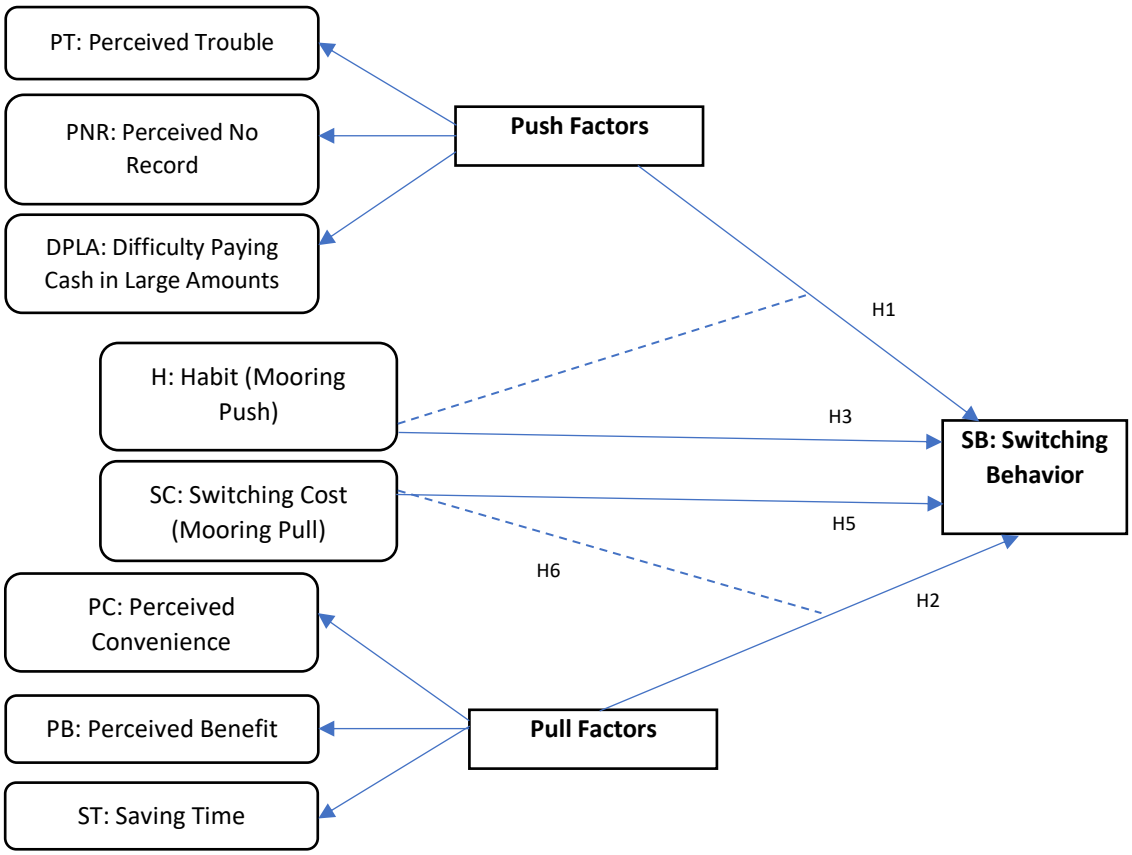

Figure 1 Research Model

Sample Method

The sample criteria for this study are those who are active or have at least used QRIS in the last 3 months. This research uses probability sampling with a proportionate stratified random sampling method to stratify each population proportionally (Sugiyono, 2009). Based on the GDP ratio in each research location, stratified proportional samples were taken. The introduction states that Sorong City has 46.28 percent GDP, Sorong Regency 33.08 percent, and Raja Ampat 11.46 percent. The total GDP derived was 90.82% from the three selected region cities selected as research locations. According to that figure, the proportional technique of 100 percent or from 150 to 300 target respondents will be allocated across three locations. Therefore, each city has 51 percent, 36 percent, and 13 percent proportional. According to Hair et al. (2006) in Qosasi et al. (2019), the sample size minimum should be 5-10 times the number of expected model coefficients. The sample size is 135–270 when multiplied by the 27 indicators planned to be used in this research. However, the number of samples obtained during field research will not be limited as long as the respondents meet the criteria for the research sample. The following description proportions this number to the research location:

Table 2 Research Proportional Sample Distribution

Location	Proportional Ratio	Sample Size 135-270
Sorong City	51%	69-153 respondents
Sorong Regency	36%	49-98 respondents
Raja Ampat Regency	13%	18-35 respondents

Data Collection and Measurement

Three of the six districts in PBD Province. Sorong City, Sorong Regency, and Raja Ampat Regency will be studied because they have the highest income and household, business, and local government consumption transactions. Reaching locations between districts and cities requires accommodation and transportation, which is difficult.

The primary data from the research was collected using a questionnaire with several questions and brief explanations. The typical research questionnaire has two parts:

1. The first part contains demographic questions such as (1) gender, (2) age, (3) education, (4) occupation, (5) average income and expenditure, as well as general questions related to the QRIS service used, such as (6) bank/QRIS service provider used and (7) average QRIS usage per month.
2. The second part contains statements related to the indicators of exogenous variables, namely push, pull, mooring factors, and endogenous switching behavior (SB). The push variable has dimensions: perceived trouble (PT), perceived no record transaction (PNR), and difficulty in paying large amounts of cash (DPLA). The pull variable has dimensions of perceived convenience (PC), perceived benefit (PB), and saving time (ST), while the mooring factor variable has dimensions of habit (Ht) and switching cost (SW).

A research instrument with 30 sub-indicators uses a Likert scale (1=Strongly disagree, 4=Strongly agree). The 4-point Likert Scale was chosen to reduce central tendency bias in 5-point scales related to neutral options, where respondents may choose the middle option as an easy out in cases of uncertainty or statement rejection (Dolnicar, 2021). The Operational Variable Matrix in Table 3 explains push-pull-mooring variable dimension sub-indicator data.

Table 3 Matrix operational variable definition

Exogenous	Definition	Dimension	Indicator	Scale	Source
Push Factors	Negative service provider factors that encourage customers to switch.	1.Perceived Trouble (PT) 2. Perceived No Record (PNR) 3. Difficulty paying large amounts of cash (DPLA)	PT1-Carrying change is uncomfortable. PT2-Calculating cash transaction totals is difficult. PT3-Cash change counting is difficult. PNR1-Cash payments rarely use receipts PNR2-Cash payments rarely provide proof of payment PNR3-Cash transaction is hard to track DPLA1-Receiving large amounts of cash becomes a hassle DPLA2-Big cash transactions are uncomfortable DPLA3-Carrying a lot of cash is a hassle	Likert Scale 1: Disagree 4: Strongly Agree	Bansal *et al*., (2005) Lu *et al.,* (2020)
Pull Factors	positive qualities of competing service providers that attract customers.	1.Perceived Convenience (PC) 2. Perceived Benefit (PB) 3. Save Time (ST)	PC1-QRIS makes cashless travel easier PC2-QRIS payments only require a mobile phone, which is convenient. PC3-QRIS payments are easy PB1-Promotions, discounts, and bonuses are appealing. PB2-Discounts and bonuses encourage payments. PB3-Taking pleasure in QRIS bonuses and promotions ST1-QRIS payment method speeds transactions ST2-QRIS payments save time ST3-QRIS payments shorten transaction settlement	Likert Scale 1: Disagree 4: Strongly Agree	Bansal et al. (2005) Lu et al. (2020)
Mooring Factors	Situations and contexts that create social or personal perception barriers that prevent customers from switching service providers	1.Habit (Ht) 2. Switching Cost (SC)	Ht1-I automatically choose the more common payment method (cash method) Ht2-I'm used to using the standard payment method Ht3-using a common method is a clearer choice SC1- QRIS payments are generally difficult to switch to SC2-Switching from cash to QRIS payments is time-consuming SC3-QRIS payments carry a high risk of large losses	Likert Scale 1: Disagree 4: Strongly Agree	Bansal et al. (2005) Limayem et al. (2007) Jones et al. (2000) Sun et al, (2017)
Endogenous	**Definition**	**Dimension**	**Indicator**	**Scale**	**Source**
Switching Behavior	Changes in service usage today to find new service providers.	_	SB1-More frequently conducting transactions using the QRIS payment method SB2-The likelihood of fully switching to the QRIS payment method SB3-Confidence in switching to the QRIS payment method	Likert Scale 1: Disagree 4: Strongly Agree	Bansal et al. (2005) Han et al. (2011) Yunita, E. (2023)

Pre-Test Analysis

A pretest was conducted to ensure that the survey items accurately represented the research variables and were valid and reliable before distribution to a minimum of 270 respondents. The pretest involved distributing the survey to 50 respondents who met the research criteria.

Data Analysis Technique

This study will use Smart PLS 4.0 for data analysis. PLS-SEM is ideal for exploratory research where the theoretical framework is still developing, which suits digital payment adoption in Southwest Papua, where infrastructure and human development are still catching up. Additionally, PLS-SEM is preferred when the research involves formative and reflective constructs, non-normal data distribution, and small-to-medium sample sizes (Hair et al., 2019). This method helps researchers model complex relationships between multiple variables, including push and pull factors. PLS-SEM is used to analyze these interrelationships simultaneously and gain a solid understanding of the factors that influence users' switching from cash to QRIS, improving methodological transparency and linking research objectives with statistical approaches. This study uses PLS-SEM to examine direct and indirect effects between variables, giving policymakers and financial institutions actionable insights. Studies have shown that PLS-SEM can capture user behavior in rural-urban dwellers in adopting new technologies by analyzing direct and indirect variable relationships (Acheampong et al., 2017). This can inform strategies that promote QRIS over cash transactions, accelerating digital payment adoption in Southwest Papua.

Descriptive analysis is the first step in data analysis to describe respondents. Two steps of path model analysis assessment proceed. The first tests the outer model for convergent, discriminant, and convergent validity. The inner model is tested using R^2, F^2, Q^2, path coefficient, and T-statistic in the second step.

Results and Discussion

Respondents' characteristics

The total questionnaires retrieved is 314, with 14 eliminated due to damage and exceeding the previously established proportional target of respondents by location. The remaining 300 respondents' data will be processed. The majority of research respondents who actively use or at least have used QRIS in the past three months are women (63% or 118). The majority of respondents are 17-25 years old (52%), followed by 25-35 (31%), 36-45 (12%), and the rest of them are 45 years old and older. The majority of research respondents (66%) were upper secondary school graduates, and 31% were undergraduates and postgraduates.

An overview of respondents' market share for QRIS payment providers

The data indicates that most research participants utilize the QRIS digital payment method from both bank and non-bank providers. Research respondents, on average, utilize the QRIS payment method from various payment service providers. Approximately 50% of research participants utilize QRIS payments from BRI Bank, followed by Mandiri at 38%, BNI at 19%, and BCA at 11%. Moreover, within the non-bank QRIs payment provider segment, the e-wallet applications Dana, ShopeePay, and GoPay prevail, with 29%, 19%, and 10% of respondents utilizing them, respectively. The predominant applications of QRIS involve the acquisition of goods and services, in addition to serving as a payment method during travel and for charitable donations. This research successfully identified 13% of respondents as MSME entrepreneurs utilizing the QRIS payment method in their operations.

Partial Least Square – Structural Equation Modeling (PLS-SEM) Analysis

Outer Model with Loading Factors

An outer loading value of 0.70 keeps a reflective indicator from dropping. If outer loading is 0.40 to <0.70, researchers should consider dropping. For outer loading values below <0.40, dropping is necessary (Hair et al., 2014). This research requires an Average Variance Extracted (AVE) value of > 0.50, in addition to loading factor values, for a second-order model on push and pull latent variables. Low AVE values may also indicate indicator loading issues, where indicators may not be contributing to the construct they measure. In such cases, researchers should evaluate each indicator's loading and remove those with loadings significantly below 0.5 unless there is compelling theoretical justification for their inclusion (Hair et al., 2019b).

In this model, two indicators from the dimension of the latent variable Perceived No Record (PNR) in Cash Transaction, namely PNR1 and PNR2, were dropped. These indicators described cash payment weaknesses, notably proof of payment and transaction tracing issues. However, due to their low loading values, their low loadings suggest they did not contribute adequately to the overall measurement model. Thus, in Figure 2, the external loading can be seen after dropping in the latent variable.

According to Figure 2, the repeated indicators of PNR2 and PNR3 at the latent variable Push Factors were dropped in order to get ideal AVE > 0.50 at the second order constructed. The figure shows that seven indicators are the push factors variable with the largest loading factor value, PT.2 on the Perceived Trouble dimension when cash transactions become a problem, with a value of 0.821. Nine indicators represent the pull factors variable with the largest loading factor value, ST.3 on the saving time dimension, where QRIS digital payment is more time efficient with a value of 0.819. Three indicators represent the Push Mooring Factors variable with the largest loading factor value, including the Ht.2 indicator on the Habit Variable, which explains QRIS payment users' habits, with 0.927. Three indicators represent the Pull Mooring Factors variable with the largest loading factor value, including the SC.2 indicator on the Switching Cost Variable,

which explains the perception of switching costs when users switch their payment methods with 0.938. Three indicators represent switching behavior, with SB2 having the largest loading factor value of 0.909, indicating that customers are likely to fully switch to QRIS payment methods.

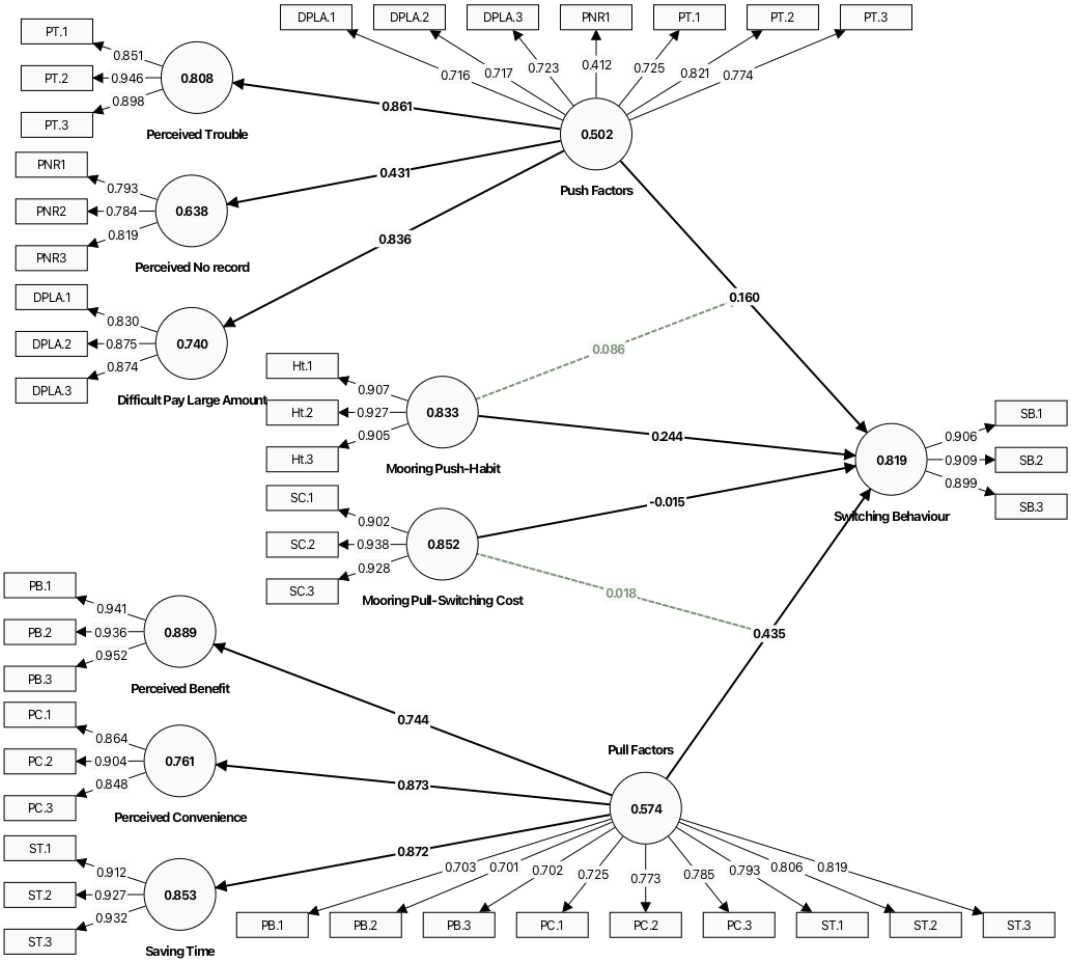

Figure 2 Outer Model after dropping Indicators

Convergent Validity Test of Research Variables

At this stage, the indicator's validity and research model compatibility can be determined. According to Ghozali (2014), Convergent validity is met with an outer loading value of 0.5 - 0.6, If the outer loading value is less than 0.5, then it can be declared low validity (less). Ghozali (2014) states that the Average Variance Extracted (AVE) value is valid if each latent variable's AVE is > 0.5. Convergent validity is met because each latent variable has an AVE value > 0.5, indicating that it well reflects indicators and measures constructs. The result of the convergent validity of this research model is shown in the Table 4.

Table 4 Convergent Validity Result

Latent Variable	Dimension	Reflective Indicators	Convergent Validity Test		Status
			Outer Loading	AVE	
PUSH FACTORS	Perceived Trouble	PT.1	0.851	0.502	VALID
		PT.2	0.946		VALID
		PT.3	0.898		VALID
	Perceived No record	PNR1	0.793		VALID
		PNR2	0.784		VALID
		PNR3	0.819		VALID
	Difficult to Pay Large Amount	DPLA.1	0.830		VALID
		DPLA.2	0.875		VALID
		DPLA.3	0.874		VALID
PULL FACTORS	Perceived Convenience	PC.1	0.864	0.574	VALID
		PC.2	0.904		VALID
		PC.3	0.848		VALID
	Perceived Benefit	PB.1	0.941		VALID
		PB.2	0.936		VALID
		PB.3	0.952		VALID
	Saving Times	ST.1	0.793		VALID
		ST.2	0.806		VALID
		ST.3	0.819		VALID
MOORING PUSH-Habit	-	Ht.1	0.907	0.833	VALID
		Ht.2	0.927		VALID
		Ht.3	0.905		VALID
MOORING PULL-Switching Cost	-	SC.1	0.902	0.852	VALID
		SC.2	0.938		VALID
		SC.3	0.928		VALID
SWITCHING BEHAVIOR	-	SB.1	0.906	0.819	VALID
		SB.2	0.909		VALID
		SB.3	0.899		VALID

Discriminant Validity Test of Research Variables

The cross-loading value discriminant validity test results are presented here. If the cross-loading value is higher than other variables in line, discriminant validity meets the requirements. The discriminant validity test result will be displayed in the Table 5.

The study's cross-loading discriminant validity test shows that the loading value for each indicator is highest on its respective latent variable compared to other variables in the model. For instance, higher loading values on the DPLA latent variable compared to other variables indicate that each of the DPLA indicators—DPLA.1, DPLA.2, and DPLA.3—are suited to measure the "Difficulty in Paying in Large Amounts." Likewise, other construct variables shown in the above table show higher values within their corresponding variables, thus supporting their discriminant validity. These findings show that the constructs are well-defined and that the model maintains discriminant validity, allowing accurate interpretation of each latent variable's unique contribution to digital payment switching user behavior.

Table 5 Cross-Loadings Result

	DPLA	SC	MP-H	PB	PC	PNR	PT	ST	SB
DPLA.1	**0.830**	0.194	0.255	0.363	0.301	0.261	0.427	0.308	0.326
DPLA.2	**0.875**	0.135	0.228	0.279	0.409	0.265	0.377	0.320	0.322
DPLA.3	**0.874**	0.122	0.276	0.263	0.414	0.309	0.393	0.285	0.334
Ht.1	0.226	0.168	**0.907**	0.426	0.330	0.091	0.190	0.237	0.472
Ht.2	0.257	0.201	**0.927**	0.486	0.348	0.121	0.233	0.279	0.468
Ht.3	0.324	0.121	**0.905**	0.492	0.440	0.158	0.176	0.338	0.472
PB.1	0.350	0.190	0.483	**0.941**	0.437	0.259	0.239	0.403	0.460
PB.2	0.339	0.209	0.481	**0.936**	0.437	0.253	0.264	0.403	0.454
PB.3	0.304	0.219	0.486	**0.952**	0.417	0.214	0.204	0.408	0.469
PC.1	0.343	0.027	0.316	0.339	**0.864**	0.294	0.184	0.598	0.494
PC.2	0.405	0.049	0.397	0.380	**0.904**	0.388	0.201	0.639	0.467
PC.3	0.390	0.054	0.353	0.470	**0.848**	0.330	0.219	0.637	0.550
PNR1	0.221	0.105	0.079	0.161	0.299	**0.793**	0.277	0.205	0.175
PNR2	0.262	0.135	0.118	0.200	0.275	**0.784**	0.165	0.219	0.148
PNR3	0.305	0.186	0.137	0.266	0.355	**0.819**	0.160	0.280	0.203
PT.1	0.379	0.192	0.202	0.242	0.194	0.231	**0.851**	0.044	0.275
PT.2	0.447	0.181	0.193	0.216	0.201	0.231	**0.946**	0.051	0.280
PT.3	0.424	0.179	0.196	0.219	0.228	0.247	**0.898**	0.045	0.262
SB.1	0.384	0.143	0.555	0.469	0.586	0.246	0.293	0.485	**0.906**
SB.2	0.318	0.127	0.413	0.418	0.471	0.164	0.282	0.419	**0.909**
SB.3	0.323	0.125	0.414	0.434	0.500	0.178	0.243	0.407	**0.899**
SC.1	0.146	**0.902**	0.181	0.218	0.049	0.163	0.159	-0.009	0.123
SC.2	0.178	**0.938**	0.165	0.214	0.066	0.170	0.167	0.066	0.116
SC.3	0.162	**0.928**	0.153	0.180	0.030	0.150	0.227	0.003	0.159
ST.1	0.334	-0.032	0.261	0.390	0.647	0.277	0.049	**0.912**	0.482
ST.2	0.314	0.045	0.335	0.392	0.663	0.227	0.054	**0.927**	0.406
ST.3	0.332	0.040	0.268	0.407	0.678	0.301	0.041	**0.932**	0.460

Reliability Test

A reliability result is acceptable if Cronbach's alpha is greater than 0.60 and satisfactory if greater than 0.70 (Hair et al., 2019). However, composite reliability values between 0.60 and 0.70 are deemed acceptable, while 0.70 to 0.90 are deemed satisfactory. Table 6 shows that all variables in this study have Chronbach's alpha values above 0.70, indicating satisfactory reliability.

Table 6 Composite Reliability Result

Variable & Dimension	Cronbach's alpha	Composite reliability (rho_c)
Difficult to Pay Large Amount	0.824	0.895
Mooring Pull-Switching Cost	0.914	0.945
Mooring Push-Habit	0.900	0.937
Perceived Benefit	0.938	0.960
Perceived Convenience	0.843	0.905
Perceived No record	0.723	0.841
Perceived Trouble	0.881	0.927
Saving Time	0.914	0.946
Switching Behavior	0.890	0.931

Structural Evaluation Test (Inner Model)

The inner model test determines how much exogenous and endogenous latent variables influence each other to answer hypothesized questions or statements. The R-squared model determines how much independent or exogenous variables affect the dependent variable.

Table 7 Coefficient of Determination

Exogenous Variable	R-squared
Switching Behavior	0.476

Chin (1998) classifies R-square values of 0.67, 0.33, and 0.19 as strong, moderate, and weak. Hair et al., (2019)also suggested that R-squared values of 0.75, 0.50, and 0.25 are substantial, moderate, and weak. The Table 7 shows that switching behaviour's R-square value of 0.476 is moderate. The moderate R^2 value indicates that the push-pull-mooring framework effectively explains switching behavior, but other variables accounting for 52.4% of variance may enhance understanding of why users switch to QRIS digital payment. Unexplained variance suggests additional factors. For instance, demographic factors, technological readiness, financial literacy, socio-economic influences, and other relevant variables may affect digital payment adoption but were not included in this model.

While the R^2 value of 0.476 suggests a good explanation, future research could explore additional variables to better understand switching behavior in digital payment contexts, especially in regions with unique infrastructural and cultural characteristics, such as Southwest Papua. This analysis of the model's explanatory capacity offers a balanced perspective, highlighting the strength of the chosen framework while recognizing the potential for improving predictive accuracy with further developed models.

The next step is that the researcher tests the inner model by looking at the bootstrapped path coefficient value to accept or reject the hypothesis. The rule of thumb used in this analysis is a T-Statistic with a value of ≥ 1.96 with a significant p-value of ≤ 0.05 to be declared significant. A variable with a path coefficient of almost +1 has a strong positive relationship, while one with almost -1 has a significant negative relationship. The test result can be seen in the Table 8.

The influence of declining cash usage has shown a notable impact on the adoption of QRIS digital payment systems. The relationship between the push factors for cash usage and the propensity to adopt digital payments is positive (0.160), statistically significant (t-stat 3.111), and exhibits a very low p-value (0.002). Despite the effect being relatively weak, these findings suggest that factors promoting a decrease of cash usage substantially impact individuals' decisions to transition to digital payments. The decision to transition was based on an analysis of various push factors stemming from the deficiencies of the cash payment feature, including perceived inconvenience, lack of transaction records, and challenges in processing large payments, ultimately influencing users to abandon this payment method. These findings align with the results of the research conducted by Lu

and Wung (2021). This finding is also supported by research findings conducted by Wiyata (2023) and Wiranatakusuma and Latief (2024) that explain the significant push factors that increase behavior change. If cash is unsafe or expensive, consumers are more likely to use digital payment options. And also, research conducted by Mai and Nguyen (2024) shows that dissatisfaction with traditional payment methods (push factors) directly correlates with a higher intention to switch to digital solutions.

Table 8 Structural Analysis Model Result

Hypothesis Developed	Connection	Path coefficient			Status	Decision
		Original Sample	T-stat	P-val		
H1	Push Factors -> Switching Behavior	0.160	3.111	0.002	Significant	Accepted
H2	Pull Factors -> Switching Behavior	0.435	7.816	0.000	Significant	Accepted
H3	Mooring Push-Habit -> Switching Behavior	0.244	3.716	0.000	Significant	Accepted
H4	Mooring Push-Habit x Push Factors -> Switching Behavior	0.086	2.024	0.043	Significant	Accepted
H5	Mooring Pull-Switching Cost -> Switching Behavior	-0.015	0.309	0.758	Not Significant	Rejected
H6	Mooring Pull-Switching Cost x Pull Factors -> Switching Behavior	0.018	0.453	0.651	Not Significant	Rejected
F^2	Push Factors			0.037		
	Pull Factors			0.248		
Q^2			0.598			

Further supporting the behavioral transition toward QRIS, the attractiveness of digital payment alternatives offers strong motivational drivers. The relationship between the pull factors from cash usage and switching behavior to adopt digital payments is positive. With an original sample value of 0.435, the relationship is strong and positive. The stronger the desire to avoid cash, the more likely people are to switch to digital payments. The dimensions of the variables in this study suggest that convenience, promotional benefits, and time savings offered by digital payment methods may be pull factors that cause someone to switch. The t-statistic value of 7.816 and p-value of 0.000, which is significantly smaller than 0.05, support the conclusion that pull factors and switching behavior are very significant. The results of this study are in line with the findings of Hamzah Muchtar et al. (2024) and Wiyata (2023): QRIS's user-friendly interface simplifies transactions for consumers and merchants. Consumers are more likely to use an easy-to-use payment method, according to research. This simplicity makes learning new technologies more appealing for cash-based users.

In Addition to these dynamics, users' decision to switch are also influenced by their long-standing habits and behavioral tendencies. The original sample value of 0.244 indicates the strength of the relationship between the habits variable as push mooring factors

influencing the transition to digital payment methods. This relationship is positive and exhibits moderate strength, with a value of 0.244. The habit of utilizing cash significantly affects the transition to digital payments, although the influence is relatively weak. This indicates that the strong habit of using cash significantly promotes the transition to digital payments, despite the resistance generated by old behaviors. The t-statistic of 3.716 indicates a statistically significant relationship between habit and switching behavior, further supported by a P-value of 0.000, which is substantially below the significance level of 0.05. This indicates that the correlation between habit as a motivating factor for cash usage and switching to digital payments is significant. This means that the habit of using cash, although it can initially be an obstacle, can actually contribute to encouraging someone to switch to digital payments. In Addition, the habit factor serves as a moderator that enhances the relationship between push factors prompting individuals to leave cash and the behavior of switching to digital payments. Despite the slight effect, as evidenced by the path coefficient or original sample value of 0.086, this outcome remains significant. Wiyata (2023) revealed that although push factors like transaction inconvenience prompt consumers to explore alternatives such as the QRIS payment method, established habits considerably affect their final decision to switch. The study revealed that habitual behaviors may impede the efficacy of push factors unless they are complemented by strong pull factors.

However, not all moderating factors possess equal significance in affecting this transition. The results indicate that switching cost is not a statistically significant element affecting switching behavior or moderating the relationship between pull factors and switching behavior. Users' choices to move from cash to digital payments like QRIS are not significantly hindered by concerns about possible costs involved in switching. Several studies have looked into how switching costs affect people's decisions to switch to digital payment systems. Research shows that switching costs don't have a big effect on people's choices to go from cash to digital payments like QRIS. For example, a study on the adoption of electronic payment systems for digital currency found that switching costs made people less likely to adopt, but not enough to stop people from switching (Xia et al., 2023). In the same way, research on the use of digital payments in Indonesia's traditional markets showed that switching costs did not have a big effect on people's overall switching behavior (Wiranatakusuma & Latief, 2024). Pull factors, including the perceived benefits and convenience of digital payment systems, are essential in determining consumers' switching behavior. However, the moderating effect of switching costs in this relationship has been determined to be insignificant. Research has demonstrated that the perceived switching costs are outweighed by the appeal of pull factors. For instance, research on mobile payment systems revealed that the perceived switching costs were less significant than the relative advantages of digital payments in terms of switching behavior (Fan et al., 2021). The insignificant impact of switching costs as a direct and moderating factor in shaping switching behavior may indicate contextual elements unique to the Papua Barat Daya region. Individuals in this region may not recognize substantial financial, psychological, or temporal obstacles to transitioning from cash to digital payment methods like QRIS. This may be attributed to several factors: The early phase of digital payment adoption in this region suggests that users express decreasing reliance on cash transactions, reflecting a lower resistance to embracing alternative payment

methods. Moreover, considering that infrastructure for cash transactions and withdrawals (e.g., ATMs, banks) may be less accessible in developing regions, users may perceive digital payments as appealing and convenient without the perception of incurring significant costs in making a transition.

Conclusion

This study examines the determinants affecting the transition from cash transactions to QRIS digital payments, emphasizing push factors, pull factors, and mooring factors, including habitual behavior and perceived switching costs. The results obtained in this study allow us to conclude that four hypotheses have a significant effect and are accepted, while the other two hypotheses are not significant and are rejected.

The results indicate that both push and pull factors substantially affect the transition from cash to QRIS digital payments, with pull factors having a more significant influence. Habit significantly influences the transition, serving both as a direct factor and a moderating element. The switching costs exert negligible influence, neither directly impacting switching behavior nor moderating the correlation between pull factors and the decision to switch. The research highlights that users are primarily motivated by the advantages and conveniences of digital payments rather than the perceived barriers of transitioning. as the result shows that pull factors are more effective than push factors in persuading users to transition to digital payments. Consequently, marketing strategies that emphasize the advantages and user-friendliness of QRIS are more likely to succeed in enhancing the adoption of digital payments among users.

The research findings on QRIS digital payment users in Southwest Papua Province also provide essential managerial insights for local stakeholders, particularly in facilitating the adoption of digital payment systems. By focusing on digital payment adoption in Papua Barat Daya, this study refines and expands the Push-Pull-Mooring (PPM) research framework. It also indicates that the PPM framework model can explain QRIS changes in behavior even in a region with limited digital infrastructure and high cash transaction engagement. Push (transaction difficulties and inconvenience, lack of records) and pull (convenience, time savings, and promotional benefits) factors show how cash dissatisfaction and digital payment appeal affect user behavior. However, the insignificant impact of switching costs and strong influence of habitual factors lead to a unique PPM framework extension. Even in a developing region, perceived switching costs may not be as strong a barrier as habitual factors, which act as moderate push factors. Users in Papua Barat Daya are more affected by QRIS's functional advantages than potential switching behavior barriers. It may be beneficial for managers and local stakeholders to focus on pull factors rather than switching costs to boost digital payment adoption in the region. The PPM framework is extended by showing how structural constraints and cultural habits can change the relative influence of push, pull, and enhancer factors in developing environments, providing a more nuanced understanding of digital behavior change in less digitally advanced regions.

This study's findings also carry theoretical implications, they support the literature that cash usage inefficiencies like inconvenience, difficulties, and lack of records directly affect user behavior, which explains how dissatisfaction with traditional payment methods drives users towards digital adoption. These findings also imply, from a practical standpoint, that financial service providers and policymakers should emphasize reducing the barrier of moving to digital platforms. For instance, simplifying the onboarding process for QRIS, expanding digital payment education programs, and ensuring transaction reliability can help accelerate adoption. Additionally, targeted advertisements can help customers embrace digital approaches by emphasizing the drawbacks of cash, particularly in remote locations with poor banking infrastructure. Directly addressing user issues, stakeholders can more effectively drive behavioral change and support financial inclusion.

Finally, while offering valuable insights, this study also has limitations that future research should address. The focus on Southwest Papua may limit generalizability to other regions with different socio-economic conditions, digital literacy levels, or cultural influences. Expanding research to multiple provinces may reveal how regional factors affect digital adoption. To better understand user motivations and barriers, future studies may use mixed-method approaches, combining quantitative surveys with qualitative interviews. Digital adoption behaviors' long-term effects are not examined in this study. Longitudinal research could reveal whether early adoption of digital payments leads to sustained use. These limitations could be addressed to make the PPM framework more applicable to digital transitions and provide stakeholders with specific guidance in similar developing settings.

Author Contributions

Conceptualisation, N.H. and L.D.I.; Methodology, N.H.; Investigation, N.H.; Analysis, N.H.; Original draft preparation, N.H.; Review and editing, N.H. and L.D.I.; Visualization, L.D.I; Supervision, N.H.; Project administration, N.H.; Funding acquisition, N.H. All authors have reviewed and approved to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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