Understanding Muslim's switching from cash to m-payments: based on push-pull-mooring framework

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Abstract

Purpose – The purpose of this study is to explore a theoretical model using the push-pull-mooring framework which adopts both direct and moderating effects, in relation to building antecedents of Muslim switching intention (SI) from using cash to mobile payment (m-payment).

Design/methodology/approach – The data collected were 317 respondents, then processed using the partial least squares structural equation modeling approach (SEM-PLS). Furthermore, advanced PLS techniques such as PLS predict, blindfolding and importance-performance map analysis are used to verify the statistical analysis of findings.

Findings – This research underlines the importance of religious commitment factor when talking about Muslims SI to use m-payment. Moreover, the features of m-payment, such as enjoyment, efficiency, security and convenience, have contributed to the driving and attracting factors for Muslim individuals to switch from cash to m-payment.

Practical implications – Fundamentally it is highly recommended that the highest concentration of service provider strategies is always obeying the principles of Islamic finance, with regard to the Muslim community as their target market. Specific to the government, the distribution of supporting infrastructure and literacy of new technologies such as m-payment are still important points in an effort to create a cashless society.

Originality/value – The model in this study emphasizes the internal and external construction of a Muslim in relation to the behavior of SI from using cash to m-payment. Thus, the construction of the model that has been built is considered to bring more relevant factors to explain the m-payment adoption behavior of a Muslim from various perspectives.

Keywords Push-pull-mooring theory, m-payment, Religious commitment, Switching cost, Switching intention

Paper type Research paper

List of abbreviations

Abbreviations	Meaning
PPM	Push-pull-mooring
PR	Perceived risk
MV	Monetary value
PI	Perceived inefficiency
EN	Enjoyment
CN	Convenience
PI	Personal innovativeness
SC	Switching cost
RC	Religious commitment
SI	Switching intention
CMV	Common method variance
VIF	Variance inflation factor
CR	Composite reliability
α	Cronbach's alpha
AVE	Average variance extracted
HTMT	Heterotrait-monotrait ratio
SRMR	Standardized root means square residual
IPMA	Importance-performance map analysis

Introduction

Technology development exponentially revolutionizes financial behavior. This is proven by smartphone technology, providing more accessibility and impacting on the birth of smartphone-based payment system. Mobile payment (m-payment) itself is one of the non-cash payment alternatives, believed having flexibility and offering better accessibility and security than other non-cash payment systems (offline-based); such as debit card, credit card and automatic teller machine (Busu *et al.*, 2018; Kim *et al.*, 2019a). The m-payment platform specifically uses wireless technology (internet) and smartphone as its media. Common features, such as quick response (QR) code, barcode, mobile apps, contactless near-field communication (NFC), are used to effectively and efficiently solve financial transaction (de Luna *et al.*, 2019; Kim *et al.*, 2019b).

In the context of Indonesia, there is an increasing trend related to m-payment utilization, but the amount of payment transaction using this method is still considered low when compared to countries in Southeast Asia (PayPal, 2018). Data shows that 73% of Indonesians still prefer cash transactions. This figure is higher than the average Asian population, which generally reaches 57%. Furthermore, the number of payment transactions via smartphones in Indonesia is at 47%, this number when compared to Vietnam and Thailand is still relatively low where it reaches 61% and 67%, respectively (PwC, 2019; PayPal, 2018). These results illustrate that there are still very few Indonesians who have an interest in switching from cash payments to non-cash payments including mobile payments.

According to a survey from Widyawati (2020) the biggest obstacle for Indonesians to adopt m-payment services apart from technological factors (such as difficulty in adapting, not technically understanding, not interested and preferring to transact cash), religious issues were the factor most expressed by respondents. In line with the survey, Aji *et al.* (2020) revealed that the development of a cashless society in Indonesia is accompanied by

the growing concern of the Muslim community toward Islamic principles in conducting financial transactions, as a result, many online-based communities have emerged that strongly oppose the practice of usury in financial technology products. This problem arises because m-payment applications (especially those based on financial technology) are indicated to deviate from Islamic religious rules, including the practice of discounting prices in it (Widyawati, 2020). This is a consequence of the use of m-payment, considering that this service is circulated with the permission and supervision of Bank Indonesia so that there is a regulation that floating funds are channeled 30% to Commercial Banks of the Business Group (All Conventional Banks) and 70% is placed into State Securities (Rambe, 2020; Widyawati, 2020).

Those arising facts underlies that there is a deep interest related to a more comprehensive understanding on influencing factors of switching from cash payment to electronic payment, especially for Muslims. Based on the above issue, this research highlights on the antecedent of Muslim's switching intention (SI) to m-payment usage. In previous research studies, it has been explained how an individual's adoption process to the m-payment (Gao *et al.*, 2015; Handarkho and Harjoseputro, 2019; Ooi and Tan, 2016). However, the research performed only viewed the superiority of m-payment, without considering the characteristics of the user and arising impediments (Chang *et al.*, 2017; Loh *et al.*, 2019). Furthermore, research that emphasizes the factor of religious commitment (RC) into this topic has not been carried out thoroughly, whereas the Muslim's awareness on compliance to avoid forbidden practices in the financial transaction has consciously influenced their behavior (Fauzia *et al.*, 2020; Aji *et al.*, 2020). Some previous findings have tried to elaborate compliance and Islamic knowledge factor as moderating variable adoption and perception to electronic payment, Aji *et al.* (2020) stated in his research that knowledge on riba significantly moderating Muslim's e-wallet adoption in Indonesia, where other findings showed that Islamic compliance is insignificantly moderating benefit and value perceived with perception on e-payment (Garrouch, 2021).

Based on the above background, it can be assumed that there are theoretical gaps related to this topic and the significance of an individual's RC (Islam) is still necessarily considered regarding Muslim's intention switching from cash to m-payments. Therefore, the research adopts push-pull-mooring (PPM) as the framework in solving such backlash of previous research studies and focuses on Muslim's behavior in performing financial transaction (m-payment usage) in their daily life. The pushing factors includes monetary value (MV) and perceived risk (PR) and inefficiency, and the pulling factors are enjoyment, convenience and personal innovation. Both factors, assumedly, become the significant antecedent of the shifting from cash to m-payment. Finally, the factor is the mooring effect, comprising of switching cost (SC) and RC, where it can expectedly strengthen Muslim's willingness to switch from cash to m-payment.

Literature review
M-payment in Islamic perspective
Mobile payment is defined as a payment method minimally conducted by one mobile device. This method, also, is specifically articulated as fund transferring as the return of goods and service, where a mobile device is used in the initial until last process of confirmation (Ondrus and Pigneur, 2006). The most common features found in this system are QR code, barcode, mobile apps and contactless NFC, used to efficiently and effectively solve financial transactions (de Luna *et al.*, 2019; Kim *et al.*, 2019b). There are many start-ups in Indonesia competing, at least 54 m-payment players existing in Indonesia with various types of transaction service, comprising of payment for e-commerce, person-to-person transaction,

payment point online bank and other digital payments of goods and service (Mawarrini, 2017).

Regarding the *halal* status of m-payment, some contemporary Muslim scholars have diverse argumentation on financial technology-based payment, such as e-money (Aji *et al.*, 2020; Rambe, 2020). Indonesian Muslim scholars highlights some issues necessarily requiring consideration as discussing on the motive behind this payment method, as follows (Hidajat, 2020; Rambe, 2020; Toyyibi, 2019; Widyawati, 2020):

- This business model requires an initial fund deposit. Deposit means deposited money that cannot be used by the company, though there will be reimbursement. If, however, it uses a loan agreement (*akad*), the sum of the collected fund can be used by the service provider. As the result, when there is promotion, such as a discount for user as a marketing strategy of service provider, the law of such promotion is *haram*;
- During deposit, this process currently occurring does not specifically explain option from the service provider in a binding agreement between user and provider. The transaction can be indicated as *haram* since it contains uncertainty; and
- Policy of Bank Indonesia orders that the floating fund is disbursed as of 30% to Commercial Bank Based on Business Activities, which total of the group are Conventional Bank, so it is exposed by *riba*'.

Contrary to this view, according to Aji (2019), some Muslim scholars provided a premature conclusion, arguing that providers' business model should be differentiated with banking, provider of e-money do not rely on their business in circulating money (credit/debt). In line with this argument, some Muslim scholars, similarly, suggest solutions of Sharia-based m-payment features (Rambe, 2020; Toyyibi, 2019), such as:

- Fund saved by the provider should be deposited to Sharia banking;
- As the sum of the deposited fund are used by the provider, the *akad* (agreement) is changed as debt or credit; and
- If necessary, the provider must have *halal* certificate, related to its implementation and process from an authorized regulator.

Push-pull-mooring theory

Migration law is a theory postulating an individual moving from his/her origin to other places, where such mobility is influenced by several factors, such as distance, technology and economic issue (Ravenstein, 1889). The law is supported by causing factors explained individual moving to destination considerably having more positive effect than previous one (Lee, 1966). The PPM model is developed from migration theory arguing individual moving from one to another place in a certain period (Bansal, 2005). Also, this theory (PPM) developed from migration theory introduces a Push-Pull model intervened by certain factors, the so-called Mooring factor (Moon, 1995). It assumes that the Push effect is the negative factor causing an individual leaving or moving from his/her origin due to job losing or natural disaster. While, the Pull effect is a positive effect attracting individual for a certain purpose, such as a higher income, better job opportunities or a comfortable environment (Lee, 1966). Both negative factors of the origin and positive factors of destination can cause decision-making to migrate in such place (Moon, 1995). Though the Push-Pull effect provides an applicative model of human migration, it is not comprehensive enough to explain in detail about the decision of migration factor (Bansal, 2005). Thus, the researcher

has added "intervention obstacle" or intervening variable confirming that any individual having a personal and social decision in the context of migration, called as mooring factor. Mooring factor, also known as the intervention variable, is based on life style, culture and spatial behavior facilitating or hampering the decision of migration (Bansal, 2005; Moon, 1995).

Previous research studies have largely reviewed on the model PPM to study the behavior of customer switching, connecting to a variable of SI within (Chang *et al.*, 2017; Hsieh *et al.*, 2012; Jung *et al.*, 2017). The PPM model is adopted to examine determining factors of multichannel behavior, such as user shifting of social service sites (Chang *et al.*, 2014). In line with changing trend of consumer behavior in the multichannel attitude, customer SI is defined as the attitude taken by the customer to switch from behavior using physically retail service to support available products in cellular retail (Chang *et al.*, 2017). The SI shows the shifting flow of certain service usage to other providers, where it is opposed with the concept of customer loyalty (Wieringa and Verhoef, 2007). Related to the massive development of online business, SI becomes the focus of previous research studies, defined as migration or customer's switching behavior from the user of one service to another (Hsieh *et al.*, 2012). The SI has been reviewed in research to identify influencing factors of customer's switching behavior in a novel technology service, such as social networking sites (Chang *et al.*, 2014), instant messaging (Fang and Tang, 2017), online service substitutes (Hsieh *et al.*, 2012) and e-payment (Handarkho and Harjoseputro, 2019).

Hypothesis development
The research used a PPM framework as the general approach and a hypothesis development to predict the shift in Muslim behavior from cash to m-payment (Figure 1). A PPM effect is a multidimensional construction that combines some constructs to be sub-construction (Hsieh *et al.*, 2012; Petter *et al.*, 2007). The first-order sub-construction was measured with reflective indicators and functioned as formative indicators to construct the
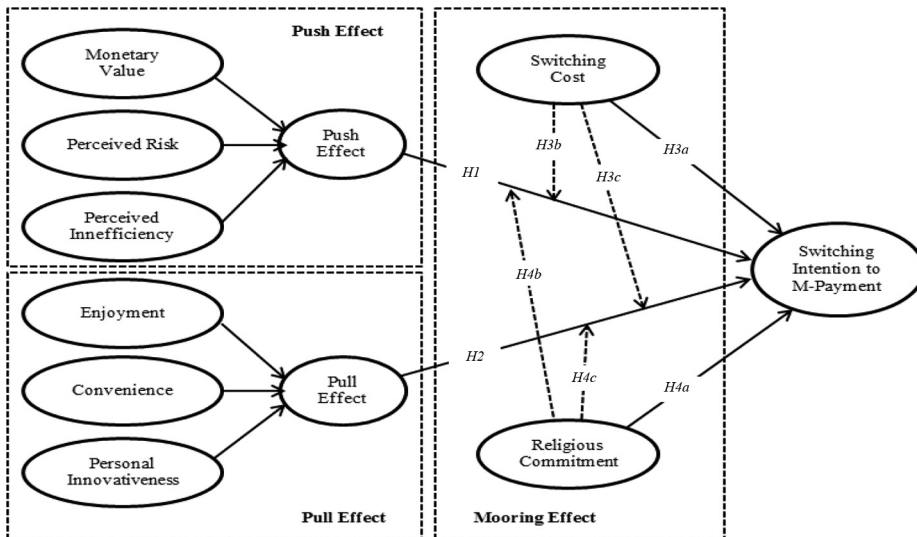

Figure 1.
Conceptual model

second-order (i.e. push and pull effect). Finally, the mooring effect's construction was measured using common factors (i.e. using a reflective measurement model).

Element of push effects

Perceived risk (PR). Classic decision theory states that risk is often associated with possible variation and its subjective value. Risk is measured non-linearly with time, money, physical damages or the variance of a probability distribution of profit and cost of certain alternatives (Barach, 1969; Mitchell, 1999). Meanwhile, Schierz *et al.* (2010) stated that risk is highly tied with the expectation of loss felt by individuals. A negative insight that has been experienced also contributes to risk perspective (Kamalul Ariffin *et al.*, 2018; Ko *et al.*, 2004). Risk contains two main factors, namely, doubts and consequences. Doubt is highly related to the probability of negative results while a consequence is with a loss (Ko *et al.*, 2004; Laroche *et al.*, 2005). The research approached the users' risk during the transaction with cash (old method) and investigated their migrations to the m-payment method. Pridemore *et al.* (2018) showed that the use of cash during transaction has a fundamental risk; first, cash tends to emphasize anonymity, making the party involved (seller and customer) only need a small amount of belief, not to mention the possibility of a dispute during the transaction time. Second, cash-based crime or intervention is difficult to track (Foley, 2011; Varjavand, 2011). Previous studies revealed that PR is a key construct in the adoption of electronic payments such as mobile banking, this is due to the inherent security features in internet connections (Mohd Thas Thaker *et al.*, 2019). Therefore, with m-payment as an alternative payment method that has relatively low-risks features and the capability to maximize security in the transaction, it empirically encourages society to shift from the old method to the new alternative (Handarkho and Harjoseputro, 2019; Loh *et al.*, 2020; Marza *et al.*, 2019).

Monetary value (MV). In the economics literature, MV stemmed from "utility-based value" perceived from product's attributes and "incapability" manifested from the priced tagged (Tellis and Gaeth, 1990). Following the idea mentioned, the previous research assumed that market choices and individual preferences are conditioned by utilitarian value perceived as rational construct aiming to maximize utility (Afuah, 2002; Chiu *et al.*, 2005; Sweeney *et al.*, 1996). This view dominates unidimensional construction in the value studies where values are associated with economics-based individual utilitarianism while prices are placed as a motivator of value perception experienced (Sánchez-Fernández and Iniesta-Bonillo, 2007). Specifically, in the business sector, customer's perception of value becomes the main focus in facing competitors. The perception toward the value is often attributed to the price offered (Chang, 2009). The research used MVs to measure individual perception toward financial benefits gotten (Liu *et al.*, 2015). Several studies have discussed how financial benefits can encourage individuals to intend to make the switch and adopt technology financial products such as m-payments (Handarkho and Harjoseputro, 2019; Darmansyah *et al.*, 2021). In line with these results, adopting the financial benefits inherent in payment services such as discounts and exclusive offers can empirically encourage service users to use certain payment systems, especially for early users (Koenig-Lewis *et al.*, 2015; Lee and Teo, 2015; Park *et al.*, 2019; Iman, 2019).

Perceived inefficiency (PI). PI refers to negative experiences felt by an individual about unoptimized resource use. PI is highly tied with wastefulness. It shows wasted or overly used resources (Phan and Ngu, 2021). PI is often associated with the "value of customers," the value are defined as "relativistic-interactive preference experience" (Zauner *et al.*, 2015). Furthermore, Holbrook (1994) argues in the typology of value that PI is measured using the output and input value processed based on an individual's relativistic-interactive preference.

This research refers to how significant the rate of an individual negative experience is in paying cash to persuade the individual to shift and use m-payment. As a rule, an individual prioritized a strong efficiency rate when he used a suitable technology (Kim *et al.*, 2019b). Technical limitations in traditional content admittedly can limit the user's aims, making an individual always try to look for a solution and contents about technology (Yew Wong and Johansen, 2008). In addition, traditional content users always associate information transparency with the traditional method. Lack of transparency makes a shift in individual behavior to leave the traditional content possible (Mujber *et al.*, 2004; Trappey and Trappey, 2004). An individual tends to consider an efficiency gain when he decides on new technology (Kim *et al.*, 2019b), especially cellular application (Murillo-Zegarra *et al.*, 2020).

Based on the exposure of the push effect elements that have been described, the hypothesis can be assumed as follows:

H1. Push effects (PR, MV, PI) have significant effects on intentions to switch from cash to m-payment.

Element of pull effects
Enjoyment (EN). Enjoyment causes the subject to be pleased and satisfied with an experience (Davis, 1982). The pleasure obtained is manifested in emotions, attitudes, positive reactions and cognitive combinations of experiences (Nabi and Krcmar, 2004; Vorderer *et al.*, 2004). In the context of technological acceptance, enjoyment is associated with behaviors that lead to pleasure in using a system, regardless of the consequences that may be anticipated (Davis, 1982). Furthermore, individuals adopting new technology are because of the unique experiences. The perceived uniqueness creates positive emotions stored as memories, which results in the sense of satisfaction which has implications for their attitudes (Koenig-Lewis *et al.*, 2015; Leischnig *et al.*, 2011). Several studies have verified enjoyment as a factor that should be prioritized in technology adoption, such as the use of the internet (Teo and Pok, 2003), acceptance of technology in transacting (Venkatesh *et al.*, 2012) and online browsing (Cox *et al.*, 2005). In the context of m-payment, the findings showed that completing financial transactions and purchases using a smartphone application tends to lead to feelings of pleasure and instant satisfaction (Handarkho and Harjoseputro, 2019; Koenig-Lewis *et al.*, 2015).

Convenience (CN). The initial idea that accompanies the notion of convenience is "convenience of goods," from which convenience is tied to savings on the dimensions of time and energy (Yale and Venkatesh, 1986). Research on the comfort dimension has been associated with spending time and energy. Individuals have different temporal orientations related to how much scarcity of time they have, the extent to which individuals value it, and the level of individual sensitivity to their time. These ideas definitely impact the individual's perceptions of comfort (Kaufman-Scarborough and Lindquist, 2003). Furthermore, effort or expenditure on energy has been considered as a non-monetary cost that is perceived as comfort and affects the emergence of physical, emotional and cognitive satisfaction (Alba *et al.*, 1997; Farquhar and Rowley, 2009). In the context of m-payment, several studies have stated that this payment method has provided instant convenience from pre-transaction to post-transaction (de Kerviler *et al.*, 2016; Liébana-Cabanillas *et al.*, 2020). For example, using a digital wallet and making transactions is as easy as swiping a smartphone (Chen and Nath, 2008; Putritama, 2019). Strengthening this statement, Humbani and Wiese (2019) revealed that m-payment could accommodate convenience and easiness in financial transaction activities, such as viewing balances, authorizing transactions and making payments.

Personal innovativeness (PI). The general theory diffusion of innovation states that individuals who have the power to innovate tend to search for information about new alternative ideas (Rogers *et al.*, 2019). Based on this theory, Agarwal and Prasad (1998) suggest that individuals develop new technology acceptance based on the synthesis of various information they get. Individuals with high personal innovation can develop positive beliefs about the new technology. For this reason, it is proper that aspects of personal traits such as personal innovation need to be considered as factors that attract individuals to adopt new technologies (Lu *et al.*, 2005; Jamshidi and Kazemi, 2019; Simarmata and Hia, 2020). Several studies have verified that PI plays an important role in adopting new technologies (Aldás-Manzano *et al.*, 2009; Boyle and Ruppel, 2006; Lu *et al.*, 2005). Strengthening these findings, Thakur and Srivastava (2014) stated that PI is empirically proven to be an essential factor in predicting technological innovations' adoption intentions, especially mobile-based payment methods (m-payment).

Based on the exposure of the pull effect elements that have been described, the hypothesis can be assumed as follows:

H2. Pull effects (enjoyment, convenience, PI) have significant effects on intentions to switch from cash to m-payment.

Element of mooring effects
Switching cost (SC). Most studies have placed SCs as a major factor in individual switching's mooring effect (Chang *et al.*, 2014). The customer incurs SCs for switching to another service provider that will not serve if the customer remains loyal to the current service provider. SC is shown as a determinant for the long-term relationship between customer and firm (Liang *et al.*, 2014). Transfer costs refer to the time, money and psychological costs incurred by the customer. Maintaining the relationship between the customer and the company is identified as a cost switching factor (Wu *et al.*, 2014). According to Aydin *et al.* (2005), SCs have three key factors; financial SC refers to losses in measurable financial resources, procedural SCs refer to all expenses related to time and effort, psychological SCs are psychological inconveniences caused by breaking of emotional ties. Empirical findings show that high SCs directly impact SI (Liang *et al.*, 2014). Furthermore, various evaluations both in monetary and non-monetary terms such as time spent, effort sacrificed, ignorance and uncertainty and various psychological impacts that arise in the switching process affect the individual's decision to make the switch (Chang *et al.*, 2017; Hsieh *et al.*, 2012; Jung *et al.*, 2017). Based on the description, the hypotheses assumed are as follows:

H3a. SCs has a significant effect on intentions to switch from cash to m-payment.

H3b. SCs moderate the relationship between push effects (PR, MV, PI) and intentions to switch from cash to m-payment.

H3c. SCs moderate the relationship between pull effects (enjoyment, convenience, PI) and intentions to switch from cash to m-payment.

Religious commitment (RC). Religion from a behavioral perspective has been treated as a multidimensional construct that significantly influences an individual's lifestyle, identity and beliefs (Coşgel and Minkler, 2004). Religion contributes to building behavior in terms of norms, decision making, attitudes and individual moral standards, both directly and indirectly (Choi, 2009). In the study of service affiliation, it is stated that individual religious behavior is fundamentally different in the decision-making process; this is due to the

influence of their philosophy and the level of their RC (Essoo and Dibb, 2004). From an Islamic perspective, every Muslim has a responsibility to his religion. Muslim's should also obey Islamic principles, especially in their daily behavior (Suhartanto *et al.*, 2019; Zakiah and Al-Aidaros, 2017). In the specific context of financial transactions, the prohibition against *riba'* (interest/usury), *gharar* (uncertainty), *maysir* (gambling) and *shubuhat* (doubtful) is a fundamental principle of Sharīʿah-compliance (Uddin, 2015; Ahmed *et al.*, 2021). *Riba'* is categorized into two perspectives: *riba' al-fadl* (excess taken in exchange for specific homogenous commodities) and *riba' alnasi'ah* (the excess accruing from a loan transaction). *Gharar* refers to uncertainty, risk, fraud in the object of a transaction both in terms of existence and description, due to barriers to information or material quality and the contract. Furthermore, *maysir* refers to wealth obtained by chance, regardless of done by intervening in others or not. Meanwhile, *shubuhat* refers to a state of confusion in understanding certain things, which causes what is wrong to look right or vice versa (Uddin, 2015; Ahmed *et al.*, 2021). These things often appear and are related to modern banking and financial transactions (Uddin, 2015). In the context of technology adoption behavior, several studies have considered a commitment to adherence to religion (Islam) as a direct or indirect antecedent (Aji *et al.*, 2020; Suhartanto *et al.*, 2019; Sun *et al.*, 2012). In the mobile banking context, Muslim are very selective about the religious values contained therein and how these values affect their adoption behavior (Suhartanto *et al.*, 2019; Sun *et al.*, 2012). Aji *et al.* (2020) state that the *riba'* that may be contained in e-money can create individual disinterest in adopting e-money technology to become a major obstacle to creating a cashless society in Indonesia. However, an interesting finding is stated by Garrouch (2021), which empirically Sharīʿah-compliance carried out by providers does not significantly moderate the relationship between perceived value and benefits on e-payment perceptions, this is due to the element of difficulty in distinguishing between payment systems that use interest rates and others. Based on the postulated explanations, the hypotheses assumed are as follows:

H4a. RC has a significant effect on intentions to switch from cash to m-payment.

H4b. RC moderate the relationship between push effects (PR, MV, PI) and intentions to switch from cash to m-payment.

H4c. RC moderate the relationship between pull effects (enjoyment, convenience, PI) and intentions to switch from cash to m-payment.

Methodology
Participant and procedure
This study accommodates a convenience sampling approach and google form media in distributing questionnaires. The object of research focuses on Islamic communities and Islamic universities on the island of Java, Indonesia. Overall, the total sample in this study was 317 respondents with a broad demographic spectrum. The spectrum of respondents in this study was based on gender, income, age, experience using m-payments and the average use of m-payments. The majority of respondents in the spectrum; gender (56.15% women), income (<2 million, 44.79%), age (<22 years, 45.11%), experience using m-payments (3–5 years, 47.9%) and average use of m-payments (every 1 month, 34.38%). Further, presented in Table 1.

Measure
The constructs in this study were measured using a Likert scale (seven-point scale), from strongly disagreeing (one) to strongly agreeing (seven). Overall, measurement items in the

Demographic characteristics		Count	(%)
Gender	Male	139	43.85
	Female	178	56.15
Personal income/allowance (per month)	<2m rupiah	142	44.79
	2–4m rupiah	74	23.34
	4–6m rupiah	42	13.25
	6–8m rupiah	26	8.20
	8–10m rupiah	11	3.47
	>10m rupiah	22	6.94
Age	<22 years	143	45.11
	23–36 years	94	29.65
	37–50 years	67	21.14
	>50 years	13	4.10
Experience of using smartphone devices specifically to make payment	<1 year	121	38.17
	3–5 years	152	47.95
	>5 years	44	13.88
Frequency of using a smartphone to make payment	Everyday	52	16.40
	Every week	108	34.07
	Every month	109	34.38
	Every 3 month	33	10.41
	Every 6 month	15	4.73

Table 1.
Respondent
characteristics

study were adapted from previous research, then modified according to the context and research model. Constructs SI, SC and RC are all measured using four items, each of which is adapted from de Luna *et al.* (2019), Chang *et al.* (2017), Zakiah and Al-Aidaros (2017). Furthermore, the push effect construct is measured based on its constituent constructs; MV (four items), PR (five items) and perceived inefficiency (four items). Each construct is adapted from Loh *et al.* (2020) and Mujber *et al.* (2004). Finally, the pull effect construct is measured based on its construct; enjoyment (four items), convenience (four items) and PI (four items). Each construction is adapted from Hsieh *et al.* (2012) and Thakur and Srivastava (2014).

Data analysis approach
The approach used in this study is partial least squares structural equation modeling (PLS-SEM) and is processed using the Smart-PLS third edition software. The use of PLS-SEM is based on the complexity of the research model and data that has an abnormal tendency (Hair *et al.*, 2017). The complexity refers to a research model that uses a combination of reflective, formative pathways and accommodates the moderation construct. Furthermore, the push and pull effect constructs have a reflective-formative type hierarchical component model (HCM), each of which has three lower-order constructs (LOC). Therefore, the PLS-SEM approach is appropriate in this research model.

Measurement of the reflective–formative HCM construction adopts a two-stage approach (Hair *et al.*, 2018). The first stage, an iterative indicator approach is used to obtain the LOC score. In the second stage, the LOC score is used in the measurement of the HOC model. Furthermore, measurement reliability and validity of the construct models applied in research. Structural models in this study using a direct effect and moderating effect (SC and RC). The interaction effect uses a two-stage approach as recommended by Hair *et al.* (2017). This study also accommodates a complementary analysis, namely, importance-performance map analysis (IPMA), this is because IPMA can provide an overview of the relative

importance and performance of the research model. IPMA identifies predictor constructs that have relatively high importance in predicting target construction (i.e. total effect) and relatively lower performance (i.e. average latent variable score) to identify and suggest areas for improvement (Hair *et al.*, 2018).

Result

Data screening

The data have been collected had confirmed nothing was missing. Furthermore, the common method variance (CMV) test approach was carried out. That is because the research data is collected from a single source and at the same time, so the problem of CMV potentially interfere with the validity (Podsakoff *et al.*, 2003). Harman's single-factor test was used to verify CMV. The output represents a seven-factor structure (eigenvalues greater than 1), with the maximum variance by one factor of 41.9% and each factor contributing less than 50% of the covariance in the variable. The results of this statistical test verify that there is no potential for CMV in the data used (Kamath *et al.*, 2019).

Measurement model assessment (outer model)

Formative measurement model. Checked by the outer weight values and their significance (i.e. *t*- and *p*-values). Furthermore, the formative multicollinearity indicator with variance inflation factor (VIF). The cut-off value used was *t*-values > 1.96, *p*-values < 0.05 and VIF < 5 according to the recommendation of Hair *et al.* (2017). Output shows (Table 2); The external weight value is significant (significant at the level < 0.001), the loading value is in the range of 0.799 to 0.951 (>0.70) and the VIF value is in the range of 2.029 to 3.252 (<5). The comparison of indicator weights shows that the perceived convenience, enjoyment and inefficiency have the strongest influence on the push and pull effect construct, followed by MV, personal innovation and PR.

Reflective measurement model. The first test, examined by the value of Cronbach's alpha (α) and composite reliability (CR). The output shows the value of α is in the range of 0.848 to 0.924 while CR is in the range of 0.896 to 0.941. These results confirmed the reliability of the internal consistency of the constructs (α and CR > 0.70), as recommended by Hair *et al.* (2017). The next test refers to convergent and discriminant validity, checked using outer loadings and average variance extracted (AVE) values. While discriminant validity was checked by looking at the value of the Heterotrait-Monotrait (HTMT) ratio according to the recommendations of Henseler *et al.* (2015). The output shows that the overall outer loading value is higher than 0.70 while the AVE value is in the range of 0.684 to 0.799 (>0.50). These results indicate convergent validity among reflective constructs (Hair *et al.*, 2017).

Constructs	Indicator	Loadings	Weights	VIF	*t*-value	*p*-value
Pull effect	CON	0.928	0.369	3.252	33.529	0.000
	ENJ	0.951	0.502	3.149	46.286	0.000
	PIN	0.836	0.216	2.296	19.138	0.000
Push effect	MOV	0.839	0.333	2.029	20.435	0.000
	PEN	0.946	0.627	2.062	38.534	0.000
	PER	0.799	0.160	2.174	14.015	0.000

Notes: CON is convenience, ENJ is enjoyment, PIN is personal innovativeness, MOV is monetary value, PEN is perceived inefficiency and PER is perceived risk

Table 2.
Outcome of formative measurement

Meanwhile, HTMT output shows RC and SCs, RC and SI, as well as SCs and SI which are 0.260, 0.471 and 0.099, respectively, which are lower than the maximum threshold value of 0.90 (Hair *et al.*, 2017). Thus, all reflective constructs demonstrate discriminant validity (Tables 2 and 3).

Structural model assessment (inner model)
Standardized root means square residual (SRMR) was applied to verify the suitability of the model. The SRMR output shows the expected results (saturated model = 0.062 and the estimated model = 0.061), these results are in accordance with the threshold < 0.080 (Gao *et al.*, 2015). Furthermore, the VIF output shows that the range 1.310 to 3.876 is below the 5 threshold (Hair *et al.*, 2017). VIF value justifies that this study did not indicate multicollinearity symptoms. In testing the hypothesis, this study assessed the level of significance using the bootstrap 5.000 approach (resampling) bias-corrected confidence interval with a p-value for a two-tailed significance (*p: 0.05, **p: 0.01, ***p: 0.001).

The results of direct effect analysis shows (Table 4); push effect has a significant positive effect on SI ($t = 2.687$, $p = 0.007$), pull effect has a significant positive effect on SI ($t = 4.921$, $p = 0.000$), SC has a positive effect significant on SI ($t = 2.093$, $p = 0.036$) and RC has a significant positive effect on SI ($t = 4.082$, $p = 0.000$). Meanwhile, the analysis of the moderation effect shows; SCs do not significantly moderate the relationship between push effect and SI ($t = 0.153$, $p = 0.879$), SCs significantly moderate the relationship between pull

Constructs	Indicator	Loadings	α	rho_A	CR	AVE
RC	RC1	0.773***	0.848	0.870	0.896	0.684
	RC2	0.867***				
	RC3	0.873***				
	RC4	0.789***				
SC	SC1	0.897***	0.924	1.413	0.941	0.799
	SC2	0.925***				
	SC3	0.778***				
	SC4	0.965***				
SI	SI1	0.750***	0.891	0.913	0.925	0.756
	SI2	0.888***				
	SI3	0.918***				
	SI4	0.910***				

Note: ***Significance at 0.001

Table 3.
Outcome of reflective measurement

Hypothesis	β	t-value	p-value	95% BCCI
Push effect → SI	0.195	2.687	0.007	(0.051, 0.336)
Pull effect → SI	0.385	4.921	0.000	(0.231, 0.536)
SC → SI	−0.140	2.093	0.036	(−0.223, −0.079)
RC → SI	0.197	4.082	0.000	(0.106, 0.294)
Push Effect × SC → SI	−0.011	0.153	0.879	(−0.153, 0.131)
Pull Effect × SC → SI	0.174	1.967	0.045	(0.004, 0.350)
Push Effect × RC → SI	−0.236	3.080	0.002	(−0.374, −0.094)
Pull Effect × RC → SI	0.12	1.573	0.116	(−0.048, 0.244)

Note: BCCI = bias-corrected confidence intervals

Table 4.
Outcome of the structural model

effect and SI ($t = 1.967$, $p = 0.045$), RC significantly moderates the relationship between push effect and SI ($t = 3.080$, $p = 0.002$) and RC does not significantly moderate the relationship between pull effect and SI ($t = 1.573$, $p = 0.116$).

Coefficient of determination (R^2). The result of the coefficient of determination for the SI construct shows a moderate value ($R^2 = 0.584$, R^2 adjusted = 0.573). It can be concluded that 57% of the variation in SI is explained by the push effect, pull effect, RC and SC variables. Cut off value uses R^2 threshold values of 0.75, 0.50 and 0.25 for endogenous constructs which are described as substantial, moderate and weak (Hair *et al.*, 2017). However, the R^2-value can only capture the explanatory power of the sample used and this value does not capture the predicted performance outside the sample (Shmueli *et al.*, 2019). Therefore, this study uses the PLSpredict approach with a focus on the construct of SI as the main target. The output shows that the overall predictive value of Q^2 is greater than 0 while the root mean squared error (RMSE) and mean absolute error (MAE) indicators of the PLS-SEM model have lower values than the naïve linear model. It can be concluded that the model in this study has high predictive power (Shmueli *et al.*, 2019).

Effect size and predictive relevance. Cohen f^2 is used to identify the effect between variables in the model, which indicates a change in the value of R^2 when one of the exogenous constructs is removed from the model. Cohen's f^2 value of 0.02 (small), 0.15 (moderate) and 0.35 (large) can be a measure of predictor effects (Hair *et al.*, 2017). Table 5 explains that the overall output f^2 is in the range of 0.026 to 0.092. Furthermore, predictive relevance analysis used Stone-Geisser's Q^2. The value of Q^2 can be used as a reference for the predictive relevance of the independent variable and the dependent variable (Hair *et al.*, 2017). The Q^2 value of the SI variable is 0.418, which is above the minimum threshold value of 0. This indicates that the observed values have been reconstructed properly so that the model has predictive relevance (Figure 2, Tables 4–7).

Discussion

H1 which represents the push effect of making the SI shows its significance. The findings underline that individual tend to compare gains in efficiency and benefits financially when using the cash payment method with the new method (m-payment). The higher the gain that is felt when using the m-payment method, empirically it can encourage individuals to switch from cash to m-payment payment methods (Handarkho and Harjoseputro, 2019; Kim *et al.*, 2019b). These findings also support the view that risk is also a factor driving individuals to make the switch. Where the security features inherent in technology are an important factor in influencing individual decision making considerations whether to adopt or not (Loh *et al.*, 2020; Marza *et al.*, 2019). Furthermore, *H2* which represents the pull effect of individuals making the switch is empirically supported in this study. The findings show that the feeling of pleasure that arises and the convenience that is the main feature of using m-payment empirically can be a unique attraction for individuals to move from using cash payments to m-payment (Humbani and Wiese, 2019; Koenig-Lewis *et al.*, 2015). This finding also

PLS path	VIF	Q^2	f^2	IPMA	
				Importance	Performance
Push effect → SI	3.455	0.064	0.026	0.197	77.126
Pull effect → SI	3.876	0.055	0.092	0.378	80.399
SC → SI	1.310	0.040	0.036	−0.142	28.066
RC → SI	1.432	0.057	0.065	0.201	62.426

Table 5.
Outcome of effect size and IPMA
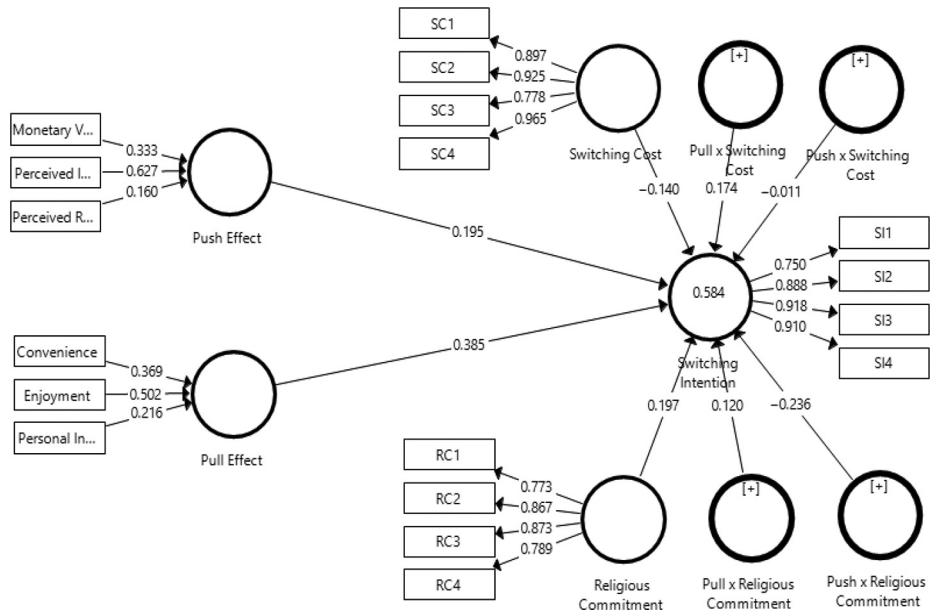
Figure 2.
Evaluation model

reinforces previous findings, which state that SI is strongly influenced by PI owned by individuals, the higher the level of PI will lead to a high sense of interest in new technology, which has implications for their adoption behavior (Thakur and Srivastava, 2014).

Finally, the mooring effect as represented by the SC and RC has a significant direct effect on the intention to switch individuals to the m-payment method (*H3a* and *H4a*). However, in moderation effect, the findings only support *H3c* and *H4b*, whereas *H3b* and *H4c* are not supported statistically. This can be explained that in the transition of individuals to new

Constructs	SSO	SSE	Q^2	R^2	R^2-adjusted
SI	1,268.000	737.413	0.418	0.584	0.573
Push effect	951.000	951.000			
Pull effect	951.000	951.000			
SC	1,268.000	1,268.000			
RC	1,268.000	1,268.000			

Note: SSO = sum of squares of observations; SSE = sum square prediction error

Table 6.
Outcome of coefficient determination and predictive relevance

Target construct		PLS-SEM			Linear model	
	RMSE	MAE	Q^2_predict		RMSE	MAE
SI 1	1.285	0.934	0.254		1.327	0.962
SI 2	1.060	0.769	0.361		1.061	0.770
SI 3	0.903	0.697	0.490		0.905	0.707
SI 4	0.867	0.665	0.538		0.877	0.676

Table 7.
Outcome of PLS predict

technologies (m-payment), relatively high SCs can potentially hinder acceptance of these technologies (Liang *et al.*, 2014; Jung *et al.*, 2017). In Indonesia, the distribution of infrastructure as the foundation for the creation of cashless payments has not been evenly distributed across the board, so the potential for the emergence of transitional costs tends to be high for cases in small cities and rural areas. As for the RC factor, the findings underline the importance of aspects of compliance with Islamic principles, specifically for modern financial transactions. In the context of utility, a Muslim is very selective with regard to their financial decision-making behavior. This is closely related to their commitment to always obey the principles set out in their religion (Islam). This finding strengthens the findings of previous research, which states that a Muslim in his behavior always adheres to the religious values contained therein. This can potentially lead to disinterest if things are found that are deviant to Islamic values, especially related to the behavior of adopting features that exist in financial technology (Suhartanto *et al.*, 2019; Sun *et al.*, 2012; Aji *et al.*, 2020).

Conclusion and implication

In general, the research's finding demonstrates its consistency with previous research studies. This research underlines the important factors of RC in the context of Muslim' SI to use m-payment. Empirically, shows that values reflected in Islam can instantly influence Muslim's decision-making behavior. In the context of m-payment, there is an indication that there are still deviations, such as obscure use of Sharia agreement (*akad*), location certainty and utilization of settled/idle fund, necessarily considered related to opposing reaction of Muslim community to switch from cash to m-payment. It is due a Muslim has a different judgment, if compared with others. The basic difference is that limitation contained in Sharia is always be maintained, whereas it relates to the perceived utility by a Muslim. Besides, some features of m-payment, such as convenience, efficiency, security and enjoyment, have contributed to push and pull factor for Muslim to switch from cash to m-payment.

Theoretical implication. In the Muslim context, the study findings can broaden the theoretical understanding of m-payment adoption that involves switching behavior perspective. Although the construct of switching behavior has been studied previously, in the Muslim context its relation to m-payment arrangements has not been fully elaborated. Therefore, the development of a model based on PPM theory can fill the gap of previous studies, where the findings only focus on the direct relationship and exclude the construct of switching behavior in m-payment adoption. Further, this study proposes a theoretical model that elaborates the construction of relevant external and internal factors in the PPM framework, to explain a comprehensive strategy regarding the adoption of m-payment in the Muslim context. Moreover, this study also proves the significance of the construction of RC, where the construct is a unique characteristic of Muslim behavior in the adoption of new technological innovations, such as m-payment. Based on this explanation, the model construction established is considered bring about more relevant factor to explain the topic from multiple perspectives.

Practical implication. In general, the practical steps proposed are based on the research's determinant. Service provider of m-payment needs to more prioritize values and superiority than a cash-based payment. Service provider, in addition, should comply features being characteristics of m-payment, such as convenience, security and accessibility in the transaction. Provider necessarily applies some financial advantages obtained by the customer, such as discount, cashback and a feature of customer's periodical financial recording, so that customer can find which financial savings item has a significant impact to his/her financial condition. However, it is fundamentally suggested that the highest

concentration of the provider's marketing strategy is to comply with Sharia financial principles by taking into account the Muslim community as their market target. Providers, practically, can collaborate with Sharia financial institution, such as Sharia banking and *Ziswaf* (*Zakat*, *Infaq-Shodaqah* and *Waqaf*) institution to firmly administer settled/idle fund. Also, providers are strongly advised to ensure the *halal* process and implementation, which is carried out by cooperating with the *halal* certification authority. This certification is useful to ensure that the process and implementation are in accordance with Sharīʿah-compliance standards so that from the customer side they do not have to worry about religious issues. For government and decision-makers in Indonesia, specifically, distribution of supporting infrastructure and new technology literacy, such as m-payment, still becomes a vital issue in establishing a cashless society. In addition, policy related to the financial technology-based product in line with Sharia principles is maximally taken over. It is due to a heated debate from various Islamic organizations and worrisome of Muslim resistance toward new technology innovation and acceptance, such as m-payment.

Limitations and further research

The limitation of this study refers to the research sample which is mostly dominated by people living in industrial areas (urban) in Indonesia. The perception of urban communities who tend to have access to technology may be different from those of people who live in areas with limited access. Therefore, it is highly recommended to focus on respondents in small cities and rural areas. Further research is also suggested to consider aspects of literacy and knowledge of Islamic principles in structural models, it is also very interesting if the context is extended to behavioral use. Multigroup analysis is also encouraged by dividing RC into low and high groups. Overall, this matter is intended to better understand comprehensively the intention of a Muslim switch from cash to m-payment, especially in developing countries like Indonesia.

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Appendix

(1) Monetary value: adapted from Loh *et al.* (2020):
- Compared to cash payment, M-payment helps me save more money.
- [. . ..], M-payment provides more profitable offers.
- [. . ..], M-payment offers more exclusive deadlines for bills/payments.
- [. . ..], M-payment is more profitable from a financial point of view.

(2) Perceived risk: adapted from Loh *et al.* (2020):
- [. . ..], M-payment guarantees more consumer personal information.
- [. . ..], M-payment is clearer in reporting errors and compensation.
- [. . ..], M-payment reduces the risk of unauthorized parties intervening.
- [. . ..], M-payment guarantees more security in financial transactions.
- [. . ..], M-payment can reduce the risks that arise.

(3) Perceived inefficiency: adapted from Mujber *et al.* (2004):
- [. . ..], M-payment saves more time.
- [. . ..], M-payment is more transparent.
- [. . ..], M-payment further increases my productivity.
- [. . ..], M-payment further increases my effectiveness.

(4) Enjoyment: adapted from Hsieh *et al.* (2012):
- Using M-payment services in transactions will be entertaining.
- Using M-payment services in transactions will be fun.
- Using M-payment services in transactions is certainly satisfying.
- Overall, it was a pleasant experience using the M-payment service.

(5) Convenience: adapted from Hsieh *et al.* (2012):
- M-payment is convenient because the smartphone is usually with me.
- M-payment is convenient because I can use it anytime.
- M-payment is convenient because I can use it in any situation.
- M-payment is convenient because the available services are easy to use.

(6) Personal innovativeness: adapted from Thakur and Srivastava (2014):
- I am always up to date with the latest technology, especially Smartphone-based.
- I usually know the latest technology services.
- I always try to find a service with the latest technology.
- In general, I like the latest technology.

(7) Switching cost: adapted from Chang *et al.* (2017):
- Switching from cash to M-payment will take a lot of energy.
- Switching from cash to M-payment will take a lot of time.
- Becoming an expert in using M-payment is not easy for me.
- In general, it will be troublesome if I switch to M-payment.

(8) Religious commitment: adapted from Zakiah and Al-Aidaros (2017):
- I know that religion forbids *riba'*, *gharar* and *maysir*.
- Religion is an important part of my daily life.

- I always stay away from income through unlawful means.
- I always try to stay away from prohibitions and follow religious precepts.

(9) Switching intention: adapted from de Luna *et al.* (2019):
- I'm considering switching from cash to M-payment.
- I am planning to switch from cash to M-payment in the future.
- My chances of switching from cash to M-payment are high.
- I am determined to switch from cash to M-payment.

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