The exploration role of Sharia compliance in technology acceptance model for e-banking (case: Islamic bank in Indonesia)

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Abstract

Purpose – The study proposes an extended model of the technology acceptance model (TAM) by including Sharia compliance (SC), knowledge of SC and confidence in SC, in addition to perceived usefulness (PU) and perceived ease of use (PEOU). This research aims to investigate its impact on satisfaction, applied in e-banking of Indonesian Islamic banking. Also, the authors study the role of SC, knowledge of SC and confidence in all relationships in TAM in explaining customer satisfaction.

Design/methodology/approach – Data collecting in this research is a self-administered survey by sending questionnaires to respondents online via e-mail or WhatsApp. The number of collected data are 300 completed questionnaires. Hypothesis testing and analyses in this research use the multiple linear regression model.

Findings – This study finds that SC, knowledge about SC and belief in SC have a significant impact on customer satisfaction of Islamic banks using e-banking. The most important finding in this study is that SC, knowledge about SC and belief in SC significantly moderate the relationship between PU and PEOU with customer satisfaction.

Originality/value – The originality of this research is exploring the role of SC, knowledge of SC and confidence in SC in all relationships, and it is expressed in the original TAM to explain customer satisfaction. This study has never been applied in previous studies, particularly studies of Islamic bank e-banking in Indonesia. This study highlights the importance of SC in the extended TAM, as a distinguishing factor between e-banking provided by Islamic banks and conventional banks, as well as the role of knowledge and confidence in SC. The authors propose policies that will be useful for the improvement of the market share of Islamic banking in Indonesia.

Keywords Satisfaction, Knowledge, TAM, Belief, Sharia compliance

Paper type Research paper

1. Introduction

Indonesia is a country that adheres to the dual banking system. Islamic banks come in the Indonesian economic system after conventional banks have grown and well developed. Religious sentiments have indeed helped build the foundations of the existence of the Islamic bank in Indonesia. The Fatwa of the Indonesian Ulema Council (MUI), which forbids bank interest, is the main driver of Muslims in Indonesia becoming customers of Islamic banks. However, the "driving force" of the MUI fatwa is minimal. This condition is at least

evident from the third-party funds absorbed by Islamic banks is only 414,942bn IDs until December 2019. It is a lower figure compared to conventional banks that reaches 5,998,648bn IDs (Financial Services Authority [OJK], 2020). Is the religious sentiment no longer enough to compete further with conventional banks? The previous number indicates that to encourage more robust sustained market growth, Islamic banks no longer rely solely on religious sentiments originating from the MUI fatwa. Islamic banks are required to strengthen the rational aspects as conventional banks are also doing, such as excellent services, ease and convenience of transactions and low costs.

The rapid progress of information technology creates new services in the form of technological applications (Lai, 2017). In the financial sector, the use of a technology known as financial technology (fintech) refers to the adoption of technology to provide convenience to financial services (Hochstein, 2015). Utilization of technology is one of the tools that Islamic banks can use to provide comfort for customers in making transactions at low costs. Islamic banks indeed take advantage of fintech, especially e-banking, to provide financial services to their customers. The problem is that conventional banks also use this technology, so competition occurs in providing this service. In marketing, product difference is an essential factor to excel in competition. Thus, Islamic banks must also differentiate the technology offered compared to conventional banks.

Considering that Fintech is relatively new, digitalization in Islamic finance is still in its early stages (Sahabuddin *et al.*, 2019), so research on Islamic Fintech is still very little. Alaabed and Mirakhor (2017) study the role of Fintech in accelerating the implementation of risk-sharing Islamic finance. Firmansyah and Ramdani (2018) study the role of Islamic Fintech in providing solutions to encourage financial inclusion and solving a specific social problem. Ulya (2018) finds that the rule of Shariah has maintained the regulation of the Islamic Fintech. Firmansyah and Anwar (2019) discuss Islamic Fintech from a challenges and prospects perspective. Using the Indonesian context, Usman *et al.* (2020) conduct a study on Islamic philanthropy by integrating trust, religiosity and image into the technology acceptance model (TAM). The results reveal that the relationship between perceived ease of use (PEOU) and perceived usefulness (PU) with TAM is determined by trust and religiosity.

There is almost no difference between Fintech and Islamic Fintech. As long as the technological solutions are not against any principle of Shariah, it can be called Islamic Fintech. Alaabed and Mirakhor (2017) argue that Fintech is in line with the spirit of Sharia because it removes two major risks, uneven maturity and leverage. The role of religiosity in TAM, as shown by research conducted by Usman *et al.* (2020) indicates that Fintech technology cannot be separated from Sharia regulations. Meanwhile, Ulya (2018) and Firmansyah and Anwar (2019) suggest building regulations that benefit all parties involved. The TAM used to study Islamic Fintech must be equipped with the principle of Sharia, one of which can be viewed from Sharia compliance (SC). Islamic law is comprehensive, so a more operational regulation is needed, as proposed by Ulya (2018) and Firmansyah and Anwar (2019) so that each actor understands the limits of compliance with Sharia. Therefore, in this paper, the proposed TAM is integrated with the fulfillment of SC, by referring to the Accounting and Auditing Organization for Islamic Financial Institution (AAOIFI) in 2017, as the only global standard for online Islamic financial dealings.

Islamic banks are banks that operate based on Islamic law (Usman *et al.*, 2017a, 2017b). Therefore, a crucial pillar in the development of Islamic banks is SC (Mulazid, 2016). SC in Islamic banks operations includes not only products but also systems, techniques and corporate identities (Sutedi and Sikumbang, 2009). In other words, fintech provided by Islamic banks must fulfill the SC or at least customers feel that fintech offered by Islamic

banks meets SC elements. Thus, SC is the primary differentiation between Islamic banks and conventional banks, including the provision of technology-based services, such as e-banking.

Empirically, increased sales, profits and cost-efficiency can be achieved by institutions whose activities focus on customer satisfaction (Asnawi *et al.*, 2020). In the context of information technology, DeLone and McLean (2003) reveal that the success of the online shopping business depends much on user satisfaction, which in turn will increase customer loyalty intentions. Therefore, Montesdioca and Macada (2015) strongly recommend measuring the success of internet service through user satisfaction. In other words, customer satisfaction in using e-banking is the key for banks to be able to compete. Evaluating e-banking services is a significant effort for that purpose.

TAM is one of the well-known models (King and He, 2006), to understand the acceptance, use and adoption of information technology. The TAM proposed by Davis (1986) has two constructs of beliefs that determine attitude to use technology, that is, PU and PEOU. Many empirical tests show that TAM is a parsimonious and robust model of technology acceptance behavior for many kinds of information technology (Gefen Karahanna, and Straub, 2003). However, as environmental and technological changes occur, researchers have proposed many extensions to the original TAM model to increase the predictive power (Lu *et al.*, 2005; Yu *et al.*, 2005; Vijayasarathy, 2004).

TAM is based on the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975). Many researchers only study how one accepts, adopts or use technology, as appeared in Alzubi *et al.* (2018), Zhao *et al.* (2018); Gefen and Rigdon (2011), Wang and Benbasat (2004). Even so, some studies have also applied TAM to evaluate the use of technology. Research conducted by Kim and Lee (2013) on the case of mobile commerce satisfaction in Korea reports that PEOU and PU both positively affect satisfaction. Study in Australia by Mather *et al.* (2002) finds that PU and PEOU affect satisfaction. Meanwhile, Tang and Nguyen (2013) reveal that the dimensions of information quality reflect the PU and PEOU, which are the system quality, influence satisfaction.

Literature shows that research involving SC variables is still limited, especially in the case of using technology at the Islamic bank. We do not find SC variables are applied in TAM to explain the satisfaction of using technology. In a different context, the study on Islamic banks by Ramdhani *et al.* (2011) and Amin and Isa (2008) reveals that SC has a significant influence on customer satisfaction. Meanwhile, in the context of Sharia hotels, Sobari *et al.* (2017) and Usman *et al.* (2017a, 2017b) reveal that the influence of SC on the satisfaction of hotel guests.

This study will use TAM as a theoretical basis by adding SC as an external variable to evaluate the use of information technology by Islamic banks in Indonesia, especially, e-banking in conducting financial transactions. From a theoretical perspective, the integration of SC in TAM is expected to increase predictive power. From the implementation perspective, it is expected to reveal the role of SC as a differentiating factor of Islamic banks from conventional banks. Particularly in providing satisfaction to customers of Islamic banks using e-banking.

In the original of TAM, PU and PEOU are constructs of belief which determine the attitude to use technology (Davis, 1986). When the attitude is replaced with satisfaction, PU and PEOU are no longer a construct of belief from customers. It comes from the customer evaluations of these variables based on their experience using e-banking provided by Islamic banks. Evaluation results given by these respondents can be conceptualized as customer experience. It is defined by Meyer and Schwager (2007) as the internal and subjective response of customers to have direct or indirect contact with a company.

Kotler and Keller (2016) indicate that cultural factors that can reflect consumer characteristics influence consumer behavior, including responding to their experiences. Meanwhile, Verhoef *et al.* (2009) suggest that consumer characteristics are determinants of how consumers react to the experiences they felt. Thus it can be stated that the characteristics of the respondents will determine the response to PU, PEOU and SC.

The foundation of religion is the belief that the values taught are valid. The level of individual belief in the teachings in a religion is not the same. Therefore, it can be said that religious belief is one of the characteristics of the individual. Religious belief is an essential element of religiosity (Glock and Stark, 1965; Usman *et al.*, 2017). Shamsuddin (1992) proposes the concept of loyalty in measuring religiosity, which consists of knowledge (ilm/ma'rifah), belief (faith), implementation (charity), consequences (natajah) and realizing the best (ihsan). In our research, we use knowledge and belief to measure PU, PEOU and SC in the context of customer experience. These two variables are the relevant characteristics that can be used from the elements of loyalty explained before. Considering that our research focuses on the role of SC, the concepts of knowledge and belief are those only related to SC itself. Based on this concept, the role of knowledge and belief about SC will be studied in the e-banking system in TAM as a whole.

In this study, we propose the TAM extended model to include SC, knowledge of SC and confidence in SC, in addition to PU and PEOU. We want to investigate its impact on satisfaction, applied in e-banking in Islamic banking in Indonesia. Besides, this study will explore the role of SC, knowledge of SC and confidence in all relationships expressed in the original TAM to explain customer satisfaction.

The originality of this research lies in the exploration of the role of SC, knowledge of SC and confidence in SC in all relationships. The use of original TAM to explain customer satisfaction has never been done in previous studies, particularly studies of Islamic bank e-banking in Indonesia. Our study contributes to the importance of SC in the extended TAM, as a distinguishing factor between e-banking provided by Islamic banks and conventional banks, as well as the role of knowledge and confidence in SC. The end product of this research is a proposed policy that will be useful for the improvement of the market share of Islamic banking in Indonesia.

2. Literature review and hypothesis
2.1 Technology acceptance model and satisfaction
Fred Davis has developed TAM based on the TRA developed by Fishbein and Ajzen (1975). The TRA considers attitude as something that comes from belief (Piriyakul *et al.*, 2015). The same with TAM, which also proposes two constructs of a belief that determine attitude to use technology: PU and PEOU Davis (1986). PU defines as the degree to which a person beliefs that the system would enhance his/her job performance. PEOU is the level of an individual's beliefs that the system would be energy saving or effortless (Davis, 1989).

In marketing researches, TAM appears in the information system literature as a widely known theory for investigating system usage (Isaac *et al.*, 2018). Meanwhile, Venkatesh (2000) describes TAM as one of the most influential approaches for predicting system usage and showing the robustness and effectiveness of the model. It focuses on antecedent variables by proposing the two variables (ease of use and usefulness). TAM is one of the well-known models (King and He, 2006), to understand the acceptance, use and adoption of information technology. But over time, various variations of TAM-based research emerge, one of which is used to evaluating the use of information technology.

In marketing research, one of the most important variables in evaluating is customer satisfaction. Montesdioca and Macada (2015) strongly recommend measuring the success of

internet service through user satisfaction. Therefore, various studies have used TAM to study customer satisfaction with the use of information technology provided, such as Kim and Lee (2013) and Tang and Nguyen (2013). Adamson and Shine (2003) theoretically explain that satisfaction is a dimension of attitude, as it measures affective components, which is one of attitude elements. Hence, researchers can put satisfaction on attitude in constructs of TRA, TPB and TAM.

Replacing the attitude with satisfaction in TAM has a consequence that the belief–attitude–intention relationship cannot be used anymore. The satisfaction reflects the evaluation of respondents who have experience relating to the product. Meyer and Schwager (2007) define customer experience as an internal and subjective response customer to any direct or indirect contact with a company. Thompson and Kolsky (2004) state that customer experience is an accumulation of all events that are realized by a customer. Thus, PU, PEOU and SC in this study are responses related to products in the context of the consumer experience.

Customer satisfaction includes the offered complete performance evaluation (Johnson and Fornell, 1992). Customers can achieve satisfaction if their expectations of service or product are relatively similar to perceived reality. In modern retailing, where transactions are carried out using information technology, including the internet, customer satisfaction occurs when customers are provided with e-commerce services provided by the store (Anderson and Srinivasan, 2003). Meanwhile, Szymanski and Hise (2000) define e-satisfaction as the customer's overall feeling of comfort with e-shopping. In this study, the definition of user satisfaction refers to Wang (2008), Wang and Liao (2008) and Roca et al. (2006), i.e. the level of satisfaction when people decide to use the internet and if it met the expectations.

Research by Kim and Lee (2013) on the case of mobile commerce satisfaction in Korea report that PEOU and PU both positively affect satisfaction. Another TAM study in Australia by Mather et al. (2002) find that PU and PEOU affect satisfaction. In the end-user computing satisfaction model, Doll and Torkzadeh (1988) use the ease of use variable as a variable that affects satisfaction. Meanwhile, Tang and Nguyen (2013) reveal that the dimension of information quality reflects the PU and PEOU, which is the system quality, influences satisfaction. These results support the research of Cheung and Lee (2005), Petter et al. (2008); Tan and Sutherland (2004), which find that quality of information and quality of system positively influence consumer satisfaction.

Some research reveals the effect of two beliefs in TAM partially on satisfaction. Various studies (such as Isaac et al., 2018; Hong et al., 2006; Rana et al., 2015; Dalcher and Shine, 2003; Sun et al., 2008; Roca et al., 2006; Dalcher and Shine, 2003) reveal that PEOU positively influences the satisfaction. Previous researches (such as Piriyakul et al., 2015; Isaac et al., 2018; Ilias et al., 2009; Sun et al., 2008; Dalcher and Shine, 2003; Doll and Torkzadeh, 1998; Sun and Mouakket, 2015; Kim, 2014; Barnes and Vidgen, 2014; Rana et al., 2015; Lee and Lehto, 2013; Revels et al., 2010; Roca et al., 2006; Konradt et al., 2006) find that PU has a positive effect on user satisfaction.

From the literature above, the following hypotheses are proposed:

H1. PEOU has a significant positive influence on user satisfaction.

H2. PU has a significant positive influence on user satisfaction.

2.2 Sharia compliance
Culture is one of the determinants of the belief and outcomes of performing the behavior. And religion is a subculture that has durable power on the emotions, experiences, thoughts, behavior and psychology of a person as a consumer (Hirschman, 1981 and LaBarbera and Gurhan,1997). In the context of Islamic bank research, religious factors certainly cannot be

ignored because Islamic banks themselves reflect religion. Islamic banks apply a "sharia-compliant financial system," which does not allow receiving particular interest for loans, known as *riba* (Usman *et al.*, 2017). The prohibition of bank interest as a manifestation of usury is indeed the basis in the development of Islamic banks. Still, in its operations, Islamic banks must comply with Islamic law as a whole. Usman *et al.* (2017a, 2017b) mention Islamic banks are banks that operate based on Islamic law. Therefore, Islamic banks must operationally comply with various restrictions that have been established in Islamic law or known as SC. Sutedi and Sikumbang (2009) reveals that SC in Islamic banks operations includes not only products but also systems, techniques and corporate identities. Thus, all activities of Islamic banks are under Islamic law, including in the use of technology. Therefore, SC is an essential element that must be considered in the context of Islamic Banking, including e-banking.

Literature shows that research involving SC variables is still limited, especially in the case of using technology at the Islamic bank. The only literature comes from Mulia *et al.* (2020), which study the effect of SC on customer satisfaction of Islamic banks using e-banking and m-banking in Indonesia. Meanwhile, other studies link SC and satisfaction use in a different context. In their studies on Islamic banks, Ramdhani *et al.* (2011) and Amin and Isa (2008) reveal that SC has a significant influence on customer satisfaction. Meanwhile, in the context of Sharia hotels, Sobari *et al.* (2017), Usman *et al.* (2017a, 2017b) and Battor and Ismail (2015) reveal that the influence of SC on the satisfaction of hotel guests.

AAOIFI developed the Online Financial Dealings Standard No. 38 in 2017. It provides almost SC aspects regarding online contracts, online dealing with financial transactions. It also contains online platform for other requirements, either through commercial sites or online access services. Concerning contracts, this standard specifies in detail various aspects that are following Sharia, including determining the timing of the start of the contract, ownership procedures after signing the contract and protection of online financial transactions. All online contracts made between the institution and its clients, such as opening accounts, remittances and signing commercial contracts must comply with the general rules of Islamic financial transactions.

AAOIFI in 2017 also emphasized that Sharia allows commercial sites, as long as they are free from practices that are contrary to Sharia itself. For example, the promotion of haram (not permitted) goods and services or using unauthorized means to promote halal (permitted) goods and services. This standard also emphasizes the prohibition of infringing trade names, trade addresses, trademarks and all other similar rights. Institutions that provide website services are required to build a system to prevent clients from making mistakes, such as providing a step for acceptance confirmation. The institution should use all possible measures of website protection, to safeguard its rights as well as the client's right protection. Also, agencies are strictly prohibited from selling or sending data without the permission of the owner, as well as the prohibition of trespassing commercial websites and data theft.

Based on this very limited literature, the following hypotheses are proposed:

H3. SC significantly has a positive influence on user satisfaction.

Referring to the statement of Meyer and Schwager (2007), Thompson and Kolsky (2004) and Verhoef *et al.* (2009) that consumer experience relates to customer sensorial, emotional, cognitive, physical and social responses. The response to PE, PEOU, SC and satisfaction have gone through a process involving elements that already exist in the individual, which finally concludes. It is possible that in the process of achieving a response, the sensorial, emotional, cognitive, physical and social responses do not play an independent role. But rather interact with each other. When a customer responds to PU and PEOU as cognitive elements, it is very likely influenced by his assessment of SC that can represent emotional elements. With these assumptions, it can be stated that the relationship between PU and

PEOU with satisfaction is determined by SC. In other words, the relationship between PU and PEOU with satisfaction can be moderated by SC. We do not find literature that discusses the role of SC in the relationship between PU and PEOU with satisfaction, especially in the context of Islamic bank e-banking in Indonesia.

Based on the arguments above, the following hypotheses are proposed:

H4. The effect of PEOU on user satisfaction depends on SC.

H5. The effect of PU on user satisfaction depends on SC.

2.3 Knowledge and beliefs of Sharia compliance

The main sources of Islamic law are the *Qur'an* and the Hadith. After the Prophet Muhammad died, to face a new issue or phenomenon because of environmental and cultural changes, Muslims use a new source of law, namely, the fatwa of the scholars (Hashim and Mizerski, 2010). Even so, differences of opinion on various issues cannot be avoided. Al-Qardawi (1999) reveals that although Islamic teachings have given clear instructions between halal and haram, the debate over various issues cannot be avoided. Especially the current issues which are not ordered or prohibited. This condition implies that even in one religion, there is a possibility that someone has different beliefs. Therefore, it is also very likely that someone has different beliefs about having to fulfill SC in technology, including e-banking.

Ajzen and Fishbein (1980) introduce the concept of religious norms, which are defined as one's beliefs as the beliefs of the leaders of their religious role models. So, the actions of someone who is based on religion will be influenced by his spiritual leader (Morgan, 2004). Usman *et al.* (2017) expand the concept that the information obtained does not have to be from the spiritual leader directly but can come from other parties who have the same belief. The thoughts taught by spiritual leaders will be absorbed in their followers and transformed into knowledge, which will build one's religious norms.

Shamsuddin (1992) proposes the concept of piety to measure religiosity, which consists of knowledge (ilm/ma'rifah), belief (faith), implementation (charity), consequences (natajah) and realizing the best (ihsan). In connection with the concept of customer experience, religious norms and SC in this study, two elements are relevant, namely, knowledge and belief. As this research focuses on the role of SC, the concepts of knowledge and belief are only related to SC itself.

No research reveals the impact of knowledge about SC and confidence in SC on the satisfaction of using a technology system, especially, on customers of Islamic bank e-banking users in Indonesia. Therefore, this study uses references in different contexts. Some previous studies (such as Evans *et al.*, 2006; Aziri, 2011; Rai, 2013; Stephen and Ayaga, 2014) suggest that environmental, socio-cultural and psychological factors of individuals strongly influence the satisfaction. In his study, Ott (1989) represents the culture with knowledge and beliefs.

Based on the above arguments, the following proposals can be submitted:

H6. Knowledge about SC has a significant effect on user satisfaction.

H7. Confidence in SC has a significant effect on user satisfaction.

In the study by Kotler and Keller (2016) and Schiffman and Kanuk (2010), cultural factors that can reflect consumer characteristics influence consumer behavior, including responding to their experiences. Meanwhile, Verhoef *et al.* (2009) suggest that consumer characteristics

are determinants of how consumers respond to the experiences they feel. Thus it can be stated that the response to PU, PEOU and SC can be determined by the characteristics of the respondents, in this case, the knowledge and confidence in SC.

Individual characteristics, such as gender, age and knowledge, are well-known as moderating variables to predict consumer behavior, especially those related to satisfaction and loyalty (Walsh *et al.*, 2008; Lewis and Soureli, 2006). In Islamic marketing studies, religiosity is an individual characteristic that is used several times as a moderating variable. Eid and Gohary (2015) find that religiosity moderates the impact of Islamic physical attributes and Islamic non-physical attributes on satisfaction. These results are supported by Rahayu (2018), who reveals that religiosity moderates the relationship between Muslim customer perceived value and Islamic banking customer satisfaction. Apart from being an individual characteristic, knowledge and belief are also dimensions of religiosity. Usman *et al.* (2017) and Shamsuddin (1992) suggest that the two variables can be used as moderation variables to explain the effect of PU, PEOU and SC on satisfaction.

Based on the literature and arguments above, the following hypotheses are proposed:

H8. The effect of PEOU on user satisfaction depends on knowledge of SC.

H9. The effect of PU on user satisfaction depends on knowledge of SC.

H10. The effect of SC on user satisfaction depends on knowledge of SC.

H11. The effect of PEOU on user satisfaction depends on the belief in SC.

H12. The effect of PU on user satisfaction depends on confidence in SC.

H13. The effect of SC on user satisfaction depends on confidence in SC.

3. Methodology
The target population in this study is Islamic bank customers who use e-banking in Indonesia. The sampling technique is purposive sampling. The sample criteria are: Muslims at least 18 years old; a customer of Islamic banks; and have used e-banking to make payment transactions. The method of data collection in this study is a self-administered survey. Questionnaires are distributed to online respondents via e-mail or WhatsApp. Researcher shares questionnaire to colleagues via e-mail and WhatsApp group. They will circulate to their colleagues, friends or relatives. Up to the specified time limit, respondents return as many as 301 completed questionnaires.

The variables in this study are Customer Satisfaction (variable name: Satisfaction), Sharia Compliance (Variable name: SC), Perceived Usefulness (variable name: PU), Perceived Ease of Use (variable name: PEOU), Sharia compliance belief (variable name: BSC) and Sharia compliance knowledge (variable name: KSC). All of these variables have interval measurement scales. When SC, KSC and BSC variables are moderation variables, the three variables are transformed into dummy variables. We call dummy Sharia compliance (DSC; 1: SC many, 0: SC few), dummy Sharia compliance knowledge (DKSC; 1: KSC high, 0: KSC low) and dummy Sharia compliance belief (DBSC; 1: BSC high, 0: BSC low). All dummy variables have an ordinal measurement scale.

The item statements to measure the variables in this study refer to various sources. Variable satisfaction adopts from Amin (2016) and Lai and Li (2005). The SC adopts from Ramdhani (2011) and Ahmad and Al-Aidaros (2017). The PU and PEOU are from Lai and Li (2005). The belief follows Usman *et al.* (2017). The knowledge is following

Suchánek and Králová (2019) and Xu *et al.* (2011). All variables, as mentioned above, are quantified using a five-point Likert Scale, starting from 1 – strongly disagree at all to 5 – strongly agree.

The multiple linear regression model is applied to analyze and test the hypotheses proposed in this study. The basic model of TAM that reflects the influence of PU, PEOU and SC on Satisfaction is expressed in the following Model 1:

$$Satisfaction = \ \beta_0 + \beta_1 PU + \beta_2 PEOU + \beta_3 SC + \varepsilon_1 \tag{1}$$

The extended TAM model by including knowledge and belief variables is formulated in Model 2 below:

$$Satisfaction = \ \beta_0 + \beta_1 PU + \beta_2 PEOU + \beta_3 SC + \beta_4 Knowledge + \beta_5 Belief + \varepsilon_2 \tag{2}$$

The role of SC as a moderating variable of the relationship between PU and PEOU with satisfaction will be analyzed using the following Model 3:

$$Satisfaction = \ \beta_0 + \beta_1 PU + \beta_2 PEOU + \beta_3 SC$$
$$+ \beta_4 PU * DSC + \beta_5 PEOU * DSC + \varepsilon_3 \tag{3}$$

Meanwhile, to study the role of knowledge and belief as a moderating variable in the relationship between PU, PEOU and SC with satisfaction, the following Model 4 is used:

$$Satisfaction = \ \beta_0 + \beta_1 PU + \beta_2 PE + \beta_3 SC + \beta_4 PU * Knowledge + \beta_5 PU * Belief$$
$$+ \beta_4 PEOU * Knowledge + \beta_5 PEOU * Belief + \beta_4 SC * Knowledge$$
$$+ \beta_5 SC * Belief \, \varepsilon_4 \tag{4}$$

All statistical hypothesis tests are using a significance level (α) of 5%.

4. Result

Respondents' satisfaction with the Islamic banking e-banking system in Indonesia is quite good, though not yet at the maximum level. Table 1 informs the minimum value for satisfaction given by respondents is 1. It means that there are customers based on their experience who feel very dissatisfied with Islamic bank e-banking. This condition must undoubtedly receive the attention of Islamic banks. It is also shown that various aspects

Variable	N	Minimum	Maximum	Mean	SD
S	301	1.00	5.00	4.1176	0.53826
SC	301	1.67	5.00	3.9435	0.65556
PU	301	1.67	5.00	3.9369	0.74142
PEOU	301	1.00	5.00	4.1229	0.60677
KSC	301	1.00	5.00	4.3056	0.67630
BSC	301	1.00	5.00	4.1816	0.80107

Table 1.
Descriptive statistics

must be continuously improved by Islamic banks in Indonesia so that customer satisfaction can increase, and no more customers feel very dissatisfied with Islamic banking e-banking services.

Based on their experience, in general, respondents rate SC in Islamic bank e-banking in Indonesia is still not good; some respondents even rate as very poor (minimum value of SC = 1.67). This condition needs attention from Islamic banks, considering that SC differentiates between Islamic banks and conventional banks. The same is also demonstrated by PU. It means that some customers still do not concern the importance of Islamic banking e-banking to help resolve various interests in the banking context. Meanwhile, the ease of using the e-banking system is perceived well by customers, even though there are still consumers who do not. These results indicate the need for Islamic banks in Indonesia to improve the quality of e-banking services, especially those related to PU, PEOU, SC and satisfaction.

The average customer knowledge about SC and customer confidence in SC is quite high. This condition is very reasonable, considering the characteristics of Islamic banks themselves, as banks that are built based on Islamic law. Even so, it turns out there are also some respondents who have low knowledge and confidence. Islamic banks indeed tend to have market segment targets of those with great knowledge and confidence in SC. Still, this study suggests that Islamic banks never to close the market segments of those with low knowledge and confidence.

Processing data to form a basic model that shows the effect of PU, PEOU and SC on satisfaction, gives the following regression equation:

$$Satisfaction \; = \; 0.922 \, + \, 0.167 \, PU \, + \, 0.446 \, PEOU \, + \, 0.178 \, SC \qquad (5)$$

Statistical test results support the statement (Gefen *et al.*, 2003) that TAM is a robust model. The PU and PEOU significantly influence satisfaction at the level of a significant 5% (*t*-stat: PU = 5.491; PEOU = 11.340). The results support hypotheses *H1* and *H2*, in line with previous studies such as Tang and Nguyen (2013) and Cheung and Lee (2005). Hypothesis testing also shows that the SC external variables integrated into TAM significantly affect satisfaction at the level of a significant 5% (*t*-stat = 5.783), which means the data support the *H3* of this study. The results of this hypothesis test support the research of Mulia *et al.* (2020) and Sobari *et al.* (2017), Usman, *et al.* (2017), Battour and Ismail (2015), Ramdhani, and Kurniati (2011), Amin and Isa (2008), although in different research contexts. Thus it can be stated that SC has a real contribution in determining customer satisfaction using Islamic bank e-banking in Indonesia. The SC variable needs to be considered in various studies in Islamic marketing, and in implementing SC in the e-banking system as well as the manager of the Islamic bank should give it major attention.

This regression model produces a coefficient of determination (R^2) of 0.683, which indicates that there are still one or more explanatory variables that have not been accommodated by the model. This condition supports the statement (Lu *et al.*, 2005; Yu *et al.*, 2005; Vijayasarathy, 2004) that the TAM model requires external variables to strengthen predictions. The value of R^2, of course, will be smaller if SC is excluded from the model. Therefore, it can be stated that SC is an important external variable to be taken into account in TAM, especially in the field of Islamic marketing research.

The extended TAM model is an extension of Model 1 by including the KSC and BSC variables as external variables. The regression equation is as follows:

$$Satisfaction = 0.576 + 0.130\,PU + 0.446\,PEOU + 0.127\,SC + 0.096\,BSC$$
$$+ 0.072\,KSC \tag{6}$$

Model 2 also shows that PU, PEOU and SC have a significant effect on satisfaction (t-stat: PU = 4.360, PEOU = 11.761 and SC = 4.040). Statistical tests also showed the same results on BSC and KSC, which concluded that KSC and BSC significantly influenced satisfaction at α = 5% (t-stat: BSC = 4.139 and KSC = 2.611). Thus it can be stated that the data support the *H6* and *H7* of this study. Meaning, customer confidence that SC must be contained in the system and increase customer knowledge about SC has a significant impact on customer satisfaction. These results support the findings in a different context of Evans *et al.* (2006), Aziri (2011), Rai (2013), Stephen and Ayaga (2014). One of the determinants of satisfaction is culture, which, according to Ott (1989), can be represented by knowledge and belief. Meanwhile, the R^2 produced by this model is 0.711, higher than the previous models. The R^2 indicates that individual characteristics, especially knowledge about SC and belief in SC, can be used as an external variable to increase the predictive power in TAM.

Model 3 cannot be made directly, because the model violates the classic assumption in regression, namely, multicollinearity, so the model is separated into two, namely:

$$Satisfaction = 0.506 + 0.210\,PU + 0.419\,PEOU + 0.308\,SC - 0.058\,DSC*PU$$
$$t-stat \qquad (6.632) \qquad (10.719) \qquad (6.862) \qquad (-3.896)$$
$$R^2 = 0.698 \tag{7}$$

$$Satisfaction = 0.523 + 0.177\,PU + 0.447\,PEOU + 0.305\,SC - 0.054\,DSC*PEOU$$
$$t-stat \qquad (5.947) \qquad (11.650) \qquad (6.934) \qquad (-3.951)$$
$$R^2 = 0.699 \tag{8}$$

Both in equation (7) and equation (8), PU, PEOU and SC have a significant effect on satisfaction at α = 5%. In equation (7), the interaction of DSC with PU has a substantial impact on satisfaction, which means the data support the *H4* of this study. This condition shows that DSC moderates the relationship between PU to satisfaction, which means that the magnitude of PU's influence on satisfaction is determined by SC. A negative regression coefficient sign means a group that assesses SC widely contained in the e-banking system has a lower effect of PU on satisfaction than the group that assesses SC little contained the e-banking system. This condition shows that SC is a substitute for PU in influencing customer satisfaction.

Hypothesis testing of equation (8) reveals that the interaction of DSC and PEOU has a significant impact on customer satisfaction, which means the data support the *H5* of this study. The effect of PEOU on satisfaction is determined by SC. The regression coefficient of DSC and PU interaction gives the same negative regression coefficient as the coefficient of DSC and PU interaction. The group that assesses SC widely contained in the e-banking system has a lower effect of PEOU on satisfaction than the group that assesses SC little contained in the e-banking system. This condition shows that the influence of PEOU on satisfaction can be substituted by SC.

Model 4 also cannot be formed directly because of multicollinearity problems. Therefore, Model 4 must also be separated into:

$$Satisfaction = 1.134 + 0.144\,PU + 0.444\,PEOU + 0.127\,SC + 0.024\,SC*DKSC$$
$$t-stat \qquad (4.718) \qquad (11.499) \qquad (3.845) \qquad (2.468)$$
$$+\, 0.021\,SC*DBSC$$
$$t-stat \qquad (2.272)$$
$$R^2 = 0.697 \tag{9}$$

$$Satisfaction = 1.117 + 0.126\,PU + 0.443\,PEOU + 0.152\,SC + 0.023\,PU*DKSC$$
$$t-stat \qquad (3.945) \qquad (11.425) \qquad (4.858) \qquad (2.305)$$
$$+\, 0.021\,PU*DBSC$$
$$t-stat \qquad (2.216)$$
$$R^2 = 0.696 \tag{10}$$

$$Satisfaction = 1.145 + 0.142\,PU + 0.421\,PEOU + 0.149\,SC + 0.024\,PEOU*DKSC$$
$$t-stat \qquad (4.671) \qquad (10.768) \qquad (4.789) \qquad (2.583)$$
$$+\, 0.021\,PEOU*DBSC$$
$$t-stat \qquad (2.318)$$
$$R^2 = 0.698 \tag{11}$$

Equations (9)–(11) still show that PU, PEOU and SC have a significant impact on satisfaction at $\alpha = 5\%$. Hypothesis testing also shows the interaction between CS and DKSC has a significant effect on satisfaction, which means the data support the *H8* of this study. This condition shows that DKSC moderates the relationship between SC and satisfaction. The influence of SC on satisfaction depends on DKSC. With the positive regression coefficient, the group with high knowledge about SC has a higher effect of SC on satisfaction than the group with low knowledge about SC. In other words, it can be stated that the knowledge of SC drives the contribution of SC in influencing satisfaction.

Equation (9) also reveals that the interaction of SC and DBSC has a significant impact on satisfaction, which means the data supports *H9*. This condition shows that DBSC moderates the relationship between SC and satisfaction, which means the influence of SC on satisfaction depends on DBSC. The positive regression coefficient means that in the group with a high degree of confidence in SC has a higher effect of SC on satisfaction than the group with a low degree of confidence in SC. The same as the knowledge variable, the belief in SC also encourages SC's contribution to influencing satisfaction. Both conditions indicate the significant role of knowledge and confidence in increasing customer satisfaction of Islamic banks using e-banking in Indonesia.

Statistical test results in equation (10) show a significant effect of PU and DKSC interactions on satisfaction, which means the data support the *H10* of this study. Thus it can be stated that DKSC moderates the relationship between PU and satisfaction, which means that the relationship between PU and satisfaction depends on DKSC. The positive coefficient of regression indicates that in the group with high knowledge about SC has a higher effect of PU on satisfaction than the group with low knowledge about SC. In other words, knowledge about SC drives PU's contribution in influencing satisfaction.

In equation (10), the statistical test results also show a significant effect of PU and DBSC interaction on satisfaction, which means the data support the *H11* of this study. These results indicate that DBSC moderates the relationship between PU and satisfaction; the

effect of PU on satisfaction is determined by confidence in SC. The positive regression coefficient sign indicates that the group with high confidence in SC has a higher effect of PU on satisfaction than the group with low confidence in SC. In other words, beliefs about SC encourage PU's contribution to influencing satisfaction.

The statistical hypothesis test in equation (11) gives the result that the PEOU and DKSC interaction variables have a significant impact on satisfaction, which means the data supports the *H12* of this study. These results indicate that DKSC moderates the relationship between PEOU and satisfaction; the relationship between PEOU and satisfaction depends on DKSC. With a positive regression coefficient, it can be interpreted that in groups with high knowledge about SC has a higher effect of PEOU on satisfaction than groups with low knowledge about SC. Again, the knowledge of SC drives PU's contribution in influencing satisfaction.

The statistical test results in equation (11) also show a significant effect of the interaction of PEOU and DBSC on satisfaction, which means the data support the *H13* of this study. These results indicate that DBSC moderates the relationship between PEOU and satisfaction, so the effect of PEOU on satisfaction is determined by confidence in SC. The positive coefficient of regression indicates that in the group with high confidence in SC has higher effect of PEOU on satisfaction than the group that has low confidence in SC. In other words, confidence in SC drives PEOU's contribution in influencing satisfaction.

5. Discussion and conclusion

This study supports the statement of Gefen *et al.* (2003) that TAM is a robust model, even though attitude is replaced with satisfaction. Nevertheless, this study also supports Lu *et al.* (2005), Yu *et al.* (2005), Vijayasarathy (2004) and Davis (1989) about the need for external variables to improve the predictive ability of TAM. Improving performance by using e-banking and energy-saving or effortless is not enough to explain variations in customer satisfaction. This research even shows the importance of SC in explaining differences in customer satisfaction of Islamic banks using e-banking.

Research on Islamic banks should go along with religious elements. It reflects the role of SC in TAM as an external variable. In this study, SC has a significant positive effect on satisfaction. These results indicate the lack of fulfillment of SC by Islamic banks can result in a decrease in customer satisfaction. Aside from being an external variable, SC also moderates the effect of PU and PEOU on customer satisfaction. The presence of SC can reduce the impact of PU and PEOU on satisfaction.

SC might function as a substitute for PU and PEOU in influencing customer satisfaction. The contribution of PU in shaping satisfaction can be "taken over" by SC. As mentioned above, Islamic banks in Indonesia come when conventional banks are big and strong. Islamic banks might find many difficulties in competing with conventional banks, including in providing infrastructure for e-banking. Islamic banks are still having problems in giving the same system as conventional banks. From a customer perspective, the performance improvement comes from using e-banking and energy-saving or effortless. Islamic banks can rely on SC as an advantage in competing with conventional banks.

The fulfillment of SC by Islamic banks has a critical role that underlies the satisfaction of Islamic bank customers. Therefore, Islamic banks must be able to make applications that make customers feel the presence of SC there. If not, customers will question what the difference between Islamic banks and conventional banks is. Besides that, competing through PU and PEOU, of course, Islamic banks will continue to lag behind conventional banks. SC is a reliable temporary solution to compete with conventional banks. Specifically, when Islamic banks have not been able to provide PU and PEOU as desired by customers.

As stated in the previous section, religious sentiment cannot be relied upon forever. One cannot expect that the market will be interested in using Islamic banks because they have to leave conventional banks because of bank interest restrictions. Even so, customers who use Islamic banks still demand that SC be met as well as possible. In other words, even though religious sentiments have limited ability to drive the Islamic bank market, sharia values in the service of Islamic banks are the main important factors.

Knowledge about SC and confidence in SC can also be used as an external variable in TAM, especially when the dependent variable is satisfaction. The significant effect of these two variables on satisfaction supports the research of Evans *et al.* (2006); Aziri (2011); Rai (2013); and Stephen and Ayaga (2014), although in different contexts. In addition, knowledge and belief also positively moderate the effect of PU, PEOU and SC on customer satisfaction of Islamic banks. In other words, knowledge and confidence increase the effect of PU, PEOU and SC on customer satisfaction of Islamic banks.

The results of this study indicate how important the role of knowledge and confidence is to encourage the contribution of the influence of all elements of TAM and SC to satisfaction. Therefore, to increase competitive advantage with conventional banks, Islamic banks must strive to improve their customers' knowledge and confidence in SC.

Our results provide various information that leads to managerial implications. Increasing customer satisfaction can be achieved by continually refining the quality of the website and information. Islamic bank customers will feel that technology is used efficiently and is useful. When the infrastructure is not as good as conventional banks, Islamic banks should rely on SC, increase knowledge of SC and boost the confidence in SC.

Improving the existence of SC that is integrated into the system is a critical step to do. But communicating the values of SC that is already contained in the system is no less important to continue to do. The benefits of SC contained in the e-banking of Islamic banks might not be realized or known by customers because of the lack of communication carried out by Islamic banks to the market.

Descriptive statistics show that market knowledge about SC varies; even some customers do not know about it. This condition indicates that becoming an Islamic bank customer who uses e-banking is not always those with immense knowledge about SC. It is an opportunity for Islamic banks to widen the target market in this group. However, it is a fact that knowledge has a significant influence on customer satisfaction. It can increase the effect of the TAM and SC elements on satisfaction, and the Islamic bank must strive to improve the knowledge of its customers. There is no other step that must be taken by Islamic banks to increase awareness other than to educate the market about SC.

As a knowledge factor, the beliefs of Islamic bank customers who use e-banking also vary, even some of them do not believe in SC. Indeed, this is also an opportunity for Islamic banks to expand the market, but high confidence that causes high customer satisfaction. Besides that, it increases the contribution of PU, PEOU and SC in influencing customer satisfaction. Therefore, increasing customer confidence is an essential key to increasing customer satisfaction.

As Ajzen (1980) and Morgan (2004) state that one's religious beliefs and actions are determined by their leaders and role models, Islamic banks must hold Muslim scholars and scholars in providing education to the market regarding SC. Differences of opinion that sometimes occur between Muslim scholars, as stated by Al-Qardawi (1999), are very unlikely to happen in the context of SC in the e-banking system of Islamic banks. The opinion of Muslim scholars and scholars will certainly facilitate Islamic banks in conducting education, which also, can increase knowledge will also increase confidence.

Muslim scholars and scholars must indeed give education, but the media used can be various. Islamic banks can ask Muslim scholars and scholars to make books, videos, pamphlets or testimonies that contain explanations about SC in the system and the values they hold. On several occasions, scholars can appear directly in front of customers or the market. Still, nowadays, it is very efficient to spread education about SC through the internet to the market.

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