Customers' Perceptions of FinTech Adaptability in the Islamic Banking Sector: Comparative study on Malaysia and Saudi Arabia

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Abstract

Purpose – This paper aims to compare the perceptions of Islamic bank customers concerning FinTech services in Malaysia and Saudi Arabia. It also investigates the level to which customers are willing to adapt FinTech services.
Design/methodology/approach – Primary data were collected from May to September 2019 using a questionnaire to survey 102 Islamic bank customers in Malaysia, and 147 in Saudi Arabia.The data are analysed based on Structural Equation Modelling (SEM) using the partial least squares (PLS) approach.
Findings – The findings show that knowledge, attitude, and subjective norms are the highly significant determining factors that influence customers' opinions on adapting to new technology, but awareness demonstrates only a moderately positive effect. Moreover, the impact of these factors on the intention to adopt FinTech services significantly differs between Malaysian and Saudi Arabian customers.
Originality/value – This is an original study based on primary data on customers of Islamic banking in Malaysia and Saudi Arabia. It provides some novel insights into how the Islamic banking industry can boost customers' confidence and enhance their patronage by adopting FinTech in their business operation model. These findings should be of value to managers, policymakers, and regulators in the Islamic banking industry in both Muslim and non-Muslim countries.

Keywords: *Financial technology (Fintech); Islamic Bank; Attitude; Subjective norm; Knowledge; Malaysia; Saudi Arabia*

1.0 Introduction

In recent times, financial technology (FinTech) has become an indispensable means for financial institutions to remain relevant in the face of global competition, notwithstanding the current COVID-19 pandemic. The financial sector like other industries is affected by rapidly changing technology, evidenced by the disruption in the sector.The banking industry, including the Islamic banking sector, is expected to embrace the opportunity brought by the recent and rapid digital transformation to attract new customers and create growth opportunities.

Not only has FinTech emerged as one of the main disruptors of the financial markets which has contributed to change in the methods of doing business (Gomber, Koch, & Siering, 2017; Kapur, Panwar, & Singh, 2019), it has also provided a means to increase levels of efficiency and performance whilst also creating a positive experience for customers (Scardovi, 2017). Arner et al. (2015) and Schindler (2017), describe FinTech as an innovative platform that encourages new market players and promotes product inventiveness. It has many innovative aspects of fast-tracking online payment channels including Peer-to-peer (P2P), blockchain, cryptocurrency, crowdfunding, regulatory sandbox, and digital currency Bitcoin among others (CCAF, 2019; Gonzalez, 2004). FinTech is associated with cost-effectiveness and convenient services, which allows customers to execute their financial responsibilities conveniently and easily, thereby leading to increased patronage and market growth.

In support of the FinTech drive, many emerging economies have established regulatory systems in line with new demands arising in the banking industry. Malaysia and Saudi Arabia have shown interest in the new banking model and have taken the initiative to support more

modern banking practices through regulatory systems which are meant to cater for the financial and technological needs of their respective environment. The two Islamic countries are considered among the top five countries with large Islamic banking assets valued at $196 billion and $441 billion in 2019, respectively (IFSI Stability Report 2020). Similarly, they both have a high penetration level of mobile and internet, given that they have populations dominated by young people.

Recognising a significant prospect of FinTech into the banking industry, many studies have analysed adoption factors of FinTech services using various theories such as technology acceptance model (TAM) and theory of planned behaviour (TPB). However, despite the considerable studies in the field of banking and finance, there are limited studies conducted in the context of the Islamic banking sector, particularly in the developing world using a combination of theories. With this view in mind, this study attempts to fill up the research gap by exploring the perceptions of customers of Islamic banks regarding adaptability of FinTech, and investigating the extent of their knowledge, awareness, expectations, and confidence in the industry. Specifically, this study integrated the determinant factors of both the TRA and the TPB models to examine the direct link between attitude, awareness, knowledge, subjective norm, and customers' adaptability intention of FinTech.

This study will provide some novel and useful insights to the policymakers, regulatory bodies, and mangers about understanding the perceptions of customer as well as boosting up the customers' confidence and enhance their patronage by creating awareness and increase knowledge communication regarding the FinTech adaptation by Islamic banking industry, especially in Malaysia and Saudi Arabia

2.0 Literature Review

2.1 Emergence of Financial Technology in the Malaysian Banking Sector

The wave of interest in financial technology through the digitalisation of transactions in recent years has attracted the attention of the Malaysian finance industry's regulatory bodies. One of the greatest advances in FinTech in Malaysia is the application of Artificial Intelligence (AI) displacing the traditional labour-intensive working models in the country (Baker & McKenzie, 2017), though such technology is still in the nascent stage. The trend to rebranding has made many companies define themselves as digital-centric, setting up separate FinTech branches to expand their brand market share. As the finance industry in Malaysia becomes increasingly open to the developments occurring in FinTech, the sector tends to witness rapid growth. Indeed, one place in which the development of FinTech is becoming more apparent is in the banking industry. Although the Malaysian banks are embracing the dynamics in the industry by developing their own innovative ways of doing business or working with FinTech start-ups, they are also concerned about the disruptions FinTech has brought to the banking business (Desai, 2015). In 2017, Public Bank Berhad (PBB) partnered with iSentric Ltd., a digital commerce software company to develop a mobile payment solution. Moreover, Mayland Banking Berhad (Maybank) Malaysia and Hong Leong Bank have also nurturing FinTech start-ups (Fintech News Singapore, 2017). With the growing interest in the FinTech market, Malaysia has a vast opportunity to benefit from FinTech, due to its resilient underlying market, large population and business-to-consumer (B2C) model. This is augmented by the availability of the internet to markets which opens the door to a unique structure for economic growth.

Consistent with the government's aspirations, the Securities Commission (SC) of Malaysia made a milestone decision to approve six equity crowd-funding operators in 2015. These

approvals are targeted at aligning with present experiences, global systems, and to offer alternative financing channels for small businesses and entrepreneurs (Securities Commission Malaysia, 2015). In 2016, the SC amended its Guidelines regarding such Recognised Markets. These guidelines were launched as the regulatory framework for peer-to-peer (P2P) lending operators, setting out requirements for registration and obligations (Securities Commission Malaysia, 2016). Similarly, as part of the recognition of FinTech in the financial services sector, the Central Bank of Malaysia established its own financial technology regulatory framework with established guidelines to manage new risks without stifling innovation (Bank Negara Malaysia, 2016). Although this effort was motivated to facilitate innovative business ideas, and improve efficiency of financial services and products, many financial services showed undesirable attitudes to this emerging sector as they described it as a threat to their business. In 2017, the BNM demonstrated a desire for more growth to occur in this sector approving the operations of four firms within its "regulatory sandbox", with a responsibility to create innovative ways so that the quality, proficiency and access to financial services in Malaysia were enhanced (Finews.asia, 2017).

According to Statista, FinTech transactions in Malaysia in 2017 amounted to a mere $6.37 million compared to the global figure of $769.3 billion. This amount is estimated to increase as various innovations are introduced to the Malaysian capital market. Given the positive developments in Malaysia, customers will possibly continue to value and discover what FinTech can provide. However, the development of FinTech in the Islamic finance sector is still in its early stages, despite Malaysia being one of the Muslim countries seeking to strongly support and grow Shariah compliant FinTech. BNM emphasised that Islamic financial services providers must comply with the Shariah standards whilst adopting an innovative business model (Bank Negara Malaysia, 2016). Therefore, for the Islamic banking sector to position itself at the forefront of the increasingly expansive FinTech services, it needs to embrace this prospect as a digital strategy, continue to undertake collaboration, strive to enhance its knowledge and exposure in order to be able to enlighten customers.

2.2 Emergence of Financial Technology in the Saudi Arabian Banking Sector

FinTech in recent times wielded the largest impact and disruption on the banking ecosystem (The Economist, 2015). Whilst this has originated in Western market economies, these GCC economies are making steady advances including in Saudi Arabia, mainly at a nascent stage which has yet to make impacts in the global market. Specifically, the Saudi FinTech market represents a relatively smaller portion judging by the growing interest in the GCC, given its economic strength in the region.

The Saudi government's Vision 2030 aims to promote new technologies and encourage innovative ways of doing business, diversifying the economy by promoting other industries and reducing over-reliance on oil. Saudi Arabia is the leading economy in the GCC region, and the new opportunities created by FinTech are expected to help achieve the National Transformation Program of the government. The first steps in Saudi Arabia started in 2004 with the establishment of the national Electronic Bill Presentment and Payment (EBPP) system developed by the Saudi Arabian Monetary Authority (SAMA). This bill was meant to facilitate and restructure payment transactions. SAMA has also revealed arrangements to use blockchain technology to issue a digital currency recognised in cross-border operations with United Arab Emirates (Arabian Business, 2018).

The Saudi Arabian government's ambition to develop a vibrant FinTech ecosystem is confirmed by its investment in the FinTech market. This is proved by the Saudi government investing $1 billion in the US financial technology start-up SoFiin2015. Two years later in

2017 $1.4 billion was channelled into the Indian FinTech company PayTM. Similarly, an estimated $100 billion was channelled into FinTech from the Saudi government's public investment fund (PIF), the world's largest sovereign wealth fund in 2017 (Fintechnews Switzerland, 2017; Chance, 2017). Currently, the country has the highest internet and smartphone usage in the world due to its ubiquitous ICT environment and the fact that the largely young population is increasingly familiar with digital/online technologies, such as digital payments. Accordingly, the kingdom's finance industry is projected to experience a significant boost in the macroeconomic environment leading to an expansion in operations and economic growth. A key segment of the population that will benefit from finance-related innovations are young Saudi people who have the potential to be entrepreneurs and who will need financing sources in the future. Relevant exposure to and knowledge about FinTech will allow them to play key roles in the Saudi government's transformation agenda to change the economy and through this create new avenues of prosperity.

In Saudi Arabia, many banks have long recognised the risks of FinTech in business services, and for this reason they have been slow to innovate. This can help explain the slow pace adopted by the Islamic banking sector to engage in the FinTech market, including less spending on technologies which has remained an obstacle for growth. Consequently, some leading banks in the country have begun to respond to the FinTech disruption by allotting capital to identify potential investments in the start-up space, while others have adopted a proactive posture collaborating with start-ups that offer FinTech solutions, such as payment gateways and remittance solutions. In 2015, Riyad Bank partnered with Gemalto, an international digital security company, to introduce the first contactless payment system in Saudi Arabia for customers (Global Islamic Economy Gateway, 2015). In 2018, SAMA made an agreement with Ripple (real-time gross settlement system, currency exchange and remittance network), to provide its banks with the necessary support for blockchain payments (Peyton, 2018). Evidently, the country is now keeping pace with its transformational program to remain competitive in the FinTech market. Nonetheless, the Islamic banks should re-strategise to keep up with the pace of innovation in the industry, which ultimately shapes their business models and fulfils customer expectations.

2.3 FinTech from the Shariah Perspective

Islam guides every facet of human life for those who follow the faith, including financial activities. The specific legal body of guidance is known as the Shariah. Shariah signifies divine Islamic law that is derived from the Qur'anic injunctions and the Sunnah of the Prophet (PBUH) (Oladapo & Ab Rahman, 2018). Its ultimate objective is to cater for the well-being of everyone in society. In line with this spirit, many have argued that FinTech will help the Islamic finance industry to be more competitive, encourage financial inclusion by serving the poorer segments of society and improve customers' experience and trust. For example, Todorof (2018) argues that FinTech will promote competitiveness, cut costs of services, and diminish the credit gap in the Islamic finance industry. To the World Bank (2020), FinTech revolution has clearly made a promising and vibrant impact on Islamic finance in the form of Islamic FinTech ecosystem.

Other Muslim scholars held a strong position on Shariah compliance as the basis for FinTech applicability. To this group of scholars, they believe that FinTech is agreeable with the Shariah. For example, Laldin and Furqani (2019) stated that while striving to achieve the objectives of Shariah, FinTech also guarantees efficiency and Islamic ethics in transactions through its innovative products and transactions. Others resolved that financial technology is in tandem with the principles of Shariah as it eliminates unnecessary influence (Firmansyah & Anwar, 2019; Alaa Alaabed & Mirakhor, 2017). Miskam et al. (2019) argue that FinTech will

reposition the Islamic financial system through improved outreach, effective cost, Shariah-compliance, efficient processes, and financial inclusion. Oseni and Ali (2019) describe technology as neutral from the Shariah perspective, except where it contradicts the principles of Shariah. Unlike these studies, Ulya (2018) highlighted that FinTech is still far from the doctrines of Shariah and as such amendments to the Islamic FinTech regulations are pertinent. Based on the foregoing, for the Islamic banking sector to remain relevant and competitive, it is important to promote FinTech-based products that are Shariah compliant and tailored towards the wellbeing of the customer. Remarkably, both Malaysia and Saudi Arabia have launched regulatory frameworks for the smooth operations of the FinTech ecosystem.

2.4 Theoretical Background and Research Framework

Several theoretical models have provided insights on how customers respond to technological innovations. Among the predominantly used theories are the theory of reasoned action, the theory of planned behaviour and the theory of technology acceptance model. The theory of reasoned action (TRA) is one of the most widely used model across different fields of studies. Unlike other cognitive theories, the TRA tries to expound user acceptance behaviour by examining how a person's intention drives his or her behaviour to carry out a particular action. The theory suggests that beliefs, attitudes, subjective norms, normative beliefs and motivations are the factors for evaluating individuals' decisions on product or service adoption (Bagozzi, 2007; Hameed et al., 2012). This theory provides a better understanding of human behaviour with emphasis on perception on how an action could lead to the demonstration of a particular behaviour (Ajzen & Fishbein, 1980).

The theory of planned behaviour (TPB) implies that an individual's intention is controlled by three variables: attitude, subjective norms, and perceived behavioural control (Ajzen & Madden, 1986). This model has been widely used to explain customers' behaviours and to determine how these variables affect their intentions. The TPB originated from the theory of reasoned action considering perceived behaviour control as another applicable factor (Ma et al., 2012). It was later extended to consider external environment factors which include awareness and knowledge (Asif et al., 2018). According to Ma et al. (2012) and Ratten (2009), social environment and personal characteristics impact on human behaviour.

The technology acceptance model (TAM) was developed to specifically examine how consumers will respond to new technology. It is among the earlier theories established for the information technology context to establish an understanding on whether people will adopt a new technology (Venkatesh & Davis, 2000; Chen & Chang, 2013). This theory suggests that technology adoption intention is predicted by both perceived ease of use and perceived usefulness. The model has been applied in many technology-related studies to recognise, explain, and predict human behaviour (Bagozzi, 2007; Wang & Lin, 2012). To modify this model, Venkatesh and Davis (2000) incorporate social and cognitive factors; however, this model has been criticised for not taking account of other cognitive aspects of adoption behaviour, for example social influence. Thus, it does not consider other external variables that can influence behavioural intention. Similarly, Raza and Standing (2010) highlighted that the model focuses on only employees but ignores other stakeholder groups.

Based on the above, we integrate the TRA and the TPB to create the theoretical background for this paper. Since financial technology is relatively new, we utilised the TRA to include attitude and subjective norms, as determining factors of a person's intention to adopt FinTech. To incorporate other social environmental factors; awareness and knowledge, we applied the TPB. These factors are considered important in predicting customers' intention to adopt FinTech. Hence, Figure 1 shows the research model for the study.

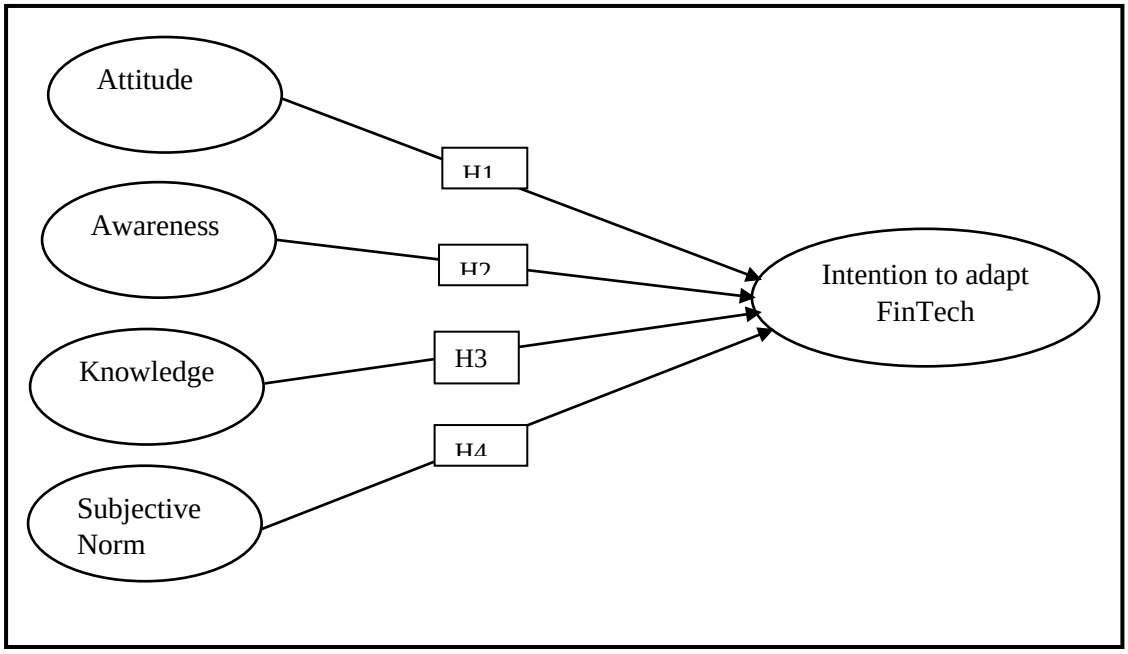

Figure 1: Research Model

2.5 Hypotheses Development

2.5.1 Attitude

In the theory of reasoned action, attitudes refer to positive or negative beliefs, which reinforce an intention to carry out a particular behaviour (Ajzen & Fishbein, 1988). This factor is similar in the TPB model. For example, an individual may believe that using technological devices helps them manage more activities or that it poses some challenges with regards transacting business easily. If the benefit outweighs the anticipated challenges, an individual may choose to adopt positive behaviour. In this context, if an Islamic banking customer believes that using financial technology will make banking services faster and more efficient, they are likely to think it is a good idea to conduct their activities through this platform, thus, establishing a positive relationship between their attitudes and intention to embrace FinTech. This positive relationship refers to the impact of attitude on behavioural intention (Ajzen & Fishbein, 1988). Prior studies have suggested that attitude has a positive impact on behavioural intentions (Chuang et al., 2016; Glavee-Geo et al., 2017; Lee, 2009; Lee, 2016; Suyanto & Kurniawan, 2019). Hence, we suggest the first hypothesis:

> *H1*: There is a positive relationship between customers' attitude and the intention to adapt FinTech services

2.5.2 Awareness

The theory of perceived behaviour has indicated that awareness is an external environmental factor that stimulates a person's intention towards taking a certain action (Ajzen, 1991). Awareness signifies an acknowledgement or understanding, which shapes a person's attitude on social and economic behaviours. Bickford and Reynolds (2002) contend that awareness is one form of social change, which increases an individual's potential for participation in certain issues. This means when a person is aware of the importance of FinTech, it will reinforce a positive attitude and perhaps his readiness to use the platform. In the financial technology context, Islamic banking customers are likely to be interested in FinTech when

they are aware that the system will help them: firstly, perform a set of financial transactions with confidence; and secondly, enable them to control their financial activities. Prior studies have provided support for the impact of awareness on behavioural intentions (Wan Ahmad, Hanifa, & Kyo, 2019; Saksonova & Kuzmina-Merlino 2017; Ramdhony, 2013). Thus, we propose the second hypothesis:

> *H2*: There is a positive relationship between customers' awareness and the intention to adapt FinTech services

2.5.3 Knowledge

The theory of perceived behaviour (Ajzen, 1991) suggests that the opportunities associated with customers' knowledge brightens their intention to embrace it. For example, customers may believe that using FinTech services will help them gain more insights or perceptions on how to carry out problem-free banking transactions. If the opportunities provided outweigh the perceived challenges, an individual may choose to adopt it. In other words, if a customer has adequate knowledge on how to handle financial transactions using technological devices, he or she will be encouraged to utilise them. Knowledge is defined as the scenario of understanding something through life or educational experience (Wirtz & Matilla, 2003). It is a combination of information, understanding, context, interpretation and reflection about a particular idea (Davenport, DeLong, & Beers, 1998). In this context, we conceptualise knowledge as a tool for understanding the dynamics of banking activities as well as persuading individuals to adopt or reject the new technology. This claim corroborates the assertion in the Qur'an, which states that knowledge bestowed on humankind by Allah is what makes him qualified as a worthy representative on earth. Indeed, prior studies have corroborated that knowledge have positive effects on behavioural intention (Carlin, Olafsson, & Pagel, 2017; Lee and Shin, 2011; Kaakeh, Hassan, & Almazor, 2017; Lumby, Browning, & Finke, 2017). Here the third hypothesis is posited:

> *H3*: There is a positive relationship between customers' knowledge and the intention to adapt FinTech services

2.5.4 Subjective norm

Subjective norm is a commonly examined predictor of technology-related behaviour. It refers to perceived social pressure on whether or not to engage in certain conduct (Ajzen & Fishbein, 1988). It means the more a person perceives that important individuals around him think he or she should act in a particular way, the more likely he or she will execute such behaviour. Ajzen (1991) highlighted that individuals who are important in a person's life such as family members, friends, managers, colleagues and peers can socially influence the performance of a certain behaviour. In essence, when a person observes that what technology influences individuals or referent groups in order to conduct financial transactions, these understandings suggest the act is will most likely be performed. This factor is relevant in both the TRA and TPB models. In the current study, subjective norm is a key determinant in adopting or using FinTech by the Islamic banking customers. Prior studies have established that subjective norms have positive effects on behavioural intention (Jerene & Sharma, 2020; Venkatesh, Morris, Davis, & Davis, 2003; Baker, Al-Gahtani, & Hubona, 2007; Al Muala et al., 2012). On this basis we suggest the fourth hypothesis:

H4: There is a positive relationship between subjective norms and customers' intention to adapt FinTech services

3. Methodology

3.1 Data Collection

Consistent with the objective of this study, Malaysia and Saudi Arabia were selected to collect data because they are listed on the network readiness index and are major Islamic banking economies. More specifically, the sample consists of Islamic banking customers in Kuala Lumpur and Jeddah. We selected individuals (in this case, Islamic banking customers) as the unit of analysis because the study aims to examine customers' intention to adapt FinTech services. More importantly, customers are crucial elements in the success of any business, and as such understanding their perception of FinTech services will guide the Islamic banking sector in meeting the expectations of their customers. Additionally, we chose Kuala Lumpur and Jeddah because: first, the majority of Islamic banks have branches in those cities; and second, they are centres for many commercial and economic activities where technological innovation is driving economic progress.

This study adopts a cross-sectional design method and structured questionnaire survey was employed. The questionnaire was administered through some delegates who are acquainted with the locations of the study. The delegates were properly briefed on the aim of the research and method of completing the questionnaires. The target population are customers with experience in digital banking activities in Malaysia and Saudi Arabia. We used a simple random sampling method in selecting the respondents from the customers of the Islamic banks who visited bank branches for what they needed. This method was considered to be the best due to its high propensity for people having a reasonable chance of being selected (Thompson, 2012). The data collection was held between May and September 2019. We distributed a total of 250 questionnaires among existing Islamic banks customers in Malaysia out of which 102 were completed and valid, showing a response rate of 40.8%. For Saudi Arabia, out of the 250 questionnaires distributed to existing Islamic bank customers, 147 were completed and valid representing 58.8%. Given the statistical analysis techniques employed in this study and the recommendations in the literature, the sample size is considered adequate (Hair et al., 2010).

3.2 Instrument Development

The questionnaire was designed to measure the independent variables (attitudes, subjective norms, awareness, and knowledge), and the dependent variable (intention). The constructs were adapted from previously validated instruments. For attitude, the scales are adapted from Venkatesh et al. (2003) and subjective norm scales from Khatimah and Halim (2016). The scales for awareness and knowledge are derived from Hall et al. (1977). We divided the questionnaire into two main sections. While the first section captures information on the independent and dependent variables, the second section focuses on the demographic details of the respondents. The questionnaire consists of six items for attitude, four items for subjective norm, six items for awareness, four items for knowledge, and five items for adaptability intention after modifications. This study employs a seven-point Likert scale to eliminate the problem of choosing between two undesirable choices and ensure the objective reality of respondents is achieved (Finstad, 2010).

3.3 Data Analysis Techniques and Diagnostic Tests

To analyse the data collected, we used the partial least squares (PLS) path modelling method and structural equation modelling (SEM). We used reliability and validity analyses, t-test, p-values, and path analysis to investigate to what extent the independent and dependent variables are related and what impact they exert. PLS-SEM is a distinct technique that explores the interaction between prediction and theory testing. More importantly, it makes it possible to estimate complex models with many constructs, indicator variables and structural paths without imposing distributional assumptions on the data (Hair et al., 2019, p. 3). Therefore, given the methodological developments in PLS-SEM and the nature of this study, this technique is considered for analysing the data. The evaluation was based on criteria recommended by Garson (2016). This study also considered the non-response bias meaning the respondents respond differently from the respondents who do not respond (Armstrong and Overton, 1977; Lewis et al., 2013). To overcome this problem, we used the late responders as non-responders and compared the relevant variables between the early and late responders. Our empirical assessment using Levene's test shows that early response and late response has no significant variance, and subsequently the study sample is free of non-respondent bias.

Furthermore, when use a survey method to collect responses, there might be a problem of a variance that is attributable to the measurement method which is known as Common method variance (CMV), which contributes to item covariation between the latent constructs and influence the structural relationship (Podsakoff et al., 2003; MacKenzie & Podsakoff, 2012; Kline et al., 2000). To void the problem, procedural design of the questionnaire design and statistical control are needed (Reio, 2010). To avoid this problem, this study followed the guidelines proposed by Podsakoff et al. (2003). Therefore, Harman's one-factor test also indicates that the single factor explained only 28.40% out of the total variance 66.52%, meaning CMV is not a problem in this study.

4. Data analysis and Results

By applying structural modelling (SEM), this study used Smart-PLS version 3.0 to understand the relationship between variables. Partial least squares (PLS) is suitable for predictive research including many mediating and latent variables and smaller sample size (Hair et al., 2019).

4.1 Demographic Profile of the Respondents

Table 1 provides detailed description of the respondents. It highlights various characteristics that emerge in the demographic information.

Table 1: Demographic Profile

Demographic Criteria		Frequency		Percentage	
		Malaysia	Saudi Arabia	Malaysia	Saudi Arabia
Gender	Male	40	113	39.2	76.9
	Female	62	34	60.8	23.1
Age	21-25	6	15	5.9	10.2

	26-30	24	31	23.5	21.1
	31-35	10	46	9.8	31.3
	36-40	31	23	30.4	15.6
	41-45	23	19	22.5	12.9
	46 & above	8	13	7.8	8.8
Education	Secondary	7	18	6.9	12.2
	Diploma	31	73	30.4	49.7
	First Degree	54	47	52.9	32.0
	Postgraduate	10	9	9.8	6.1
Marital Status	Single	37	41	36.3	27.9
	Married	53	87	52.0	59.2
	Others	12	19	11.8	12.9

Source: Authors' computation

The gender composition of the respondents from Malaysia shows a predominantly female sample of 60.8% while the Saudi sample is mainly male respondents with 76.9%. For Malaysia, the largest number of participants is in the 36-40 years age group (30.4%) followed by the 26-30 age cohort which represents 23.5% of the sample. In the case of Saudi Arabia, 31.3% of 31-35 years old represent 31.3%, while 26-30 year-olds represent 21.1% of the sample. On the level of education, 52.9% from Malaysia hold a Bachelor's degree while 49.7% of the sampled respondents from Saudi Arabia hold a diploma certificate. About 52.0% of the participants in Malaysia are married while 59.2% in Saudi Arabia are married.

4.2 Descriptive Analysis

Descriptive analysis deals with the numerical summary of stated variables by defining minimum, maximum, mean, standard deviation, and variance (Zikmund et al., 2010). Zero-order correlations between latent variables, standard deviation, and mean values are presented in Table 2.

Table 2: Zero-order correlation between variables, means, and standard deviation

Variables	Means	Std. dev	1	2	3	4	5
1. Attitude	5.6654	1.19727	1.000				
2. Awareness	4.0093	1.30132	0.151	1.000			
3. Intention	5.0416	1.12451	0.502	0.202	1.000		
4. Knowledge	5.1459	1.22526	0.634	0.254	0.517	1.000	
5. Subjective Norm	4.3123	1.22325	0.379	0.202	0.357	0.370	1.000

In this study, intention to adapt FinTech was the dependent variable while attitude, awareness, knowledge, and subjective norm were the independent variables. The mean value for attitude was 5.67 (SD = 1.20), indicating that most respondents are influenced by their attitude on the intention to adapt FinTech. The mean value for knowledge was 5.15 (SD = 1.23) which reveals that most respondents have requisite knowledge on adapting FinTech. Furthermore, results also established significant and positive relationships among all the variables of this study.

4.3 Model Efficiency Test

4.3.1 Measurement model assessment

Henseler et al. (2009) suggested the two-steps procedure to measure the PLS path model: outer model and inner model.

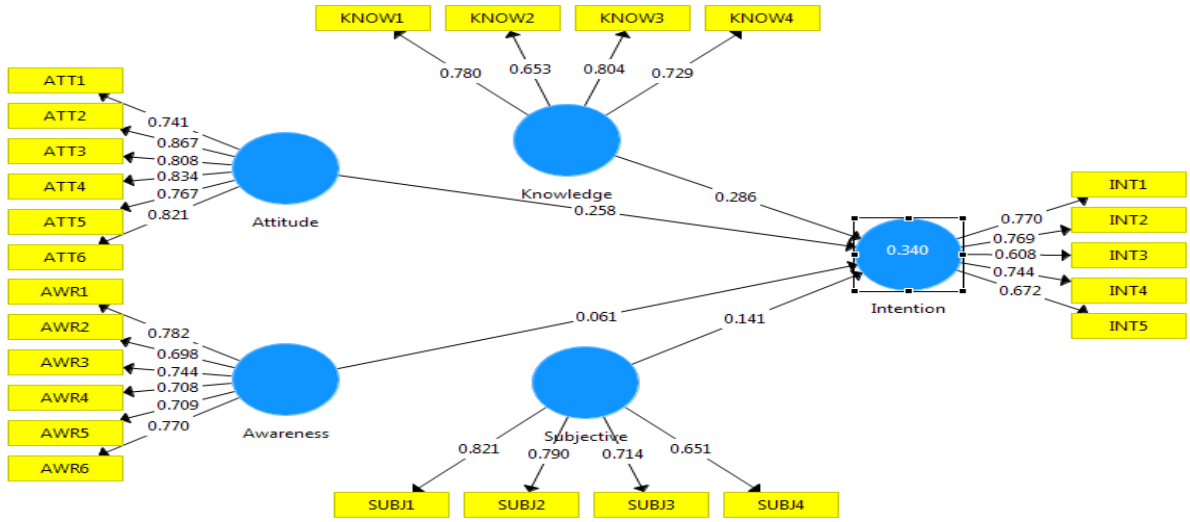

Figure 2: Measurement model

To establish convergent validity or construct reliability and validity tests through composite reliability, indicator loading, Cronbach's alpha, average variance extracted (AVE) are prerequisites for evaluating the outer model (Zikmund et al., 2010). Therefore, in this paper, indicator reliability or individual item reliability is measured by investigating the outer loadings of every item of the constructs (Hair et al., 2016; Duarte & Raposo, 2010). The R^2 of customers' intention towards FinTech is 0.590, indicating that attitude, awareness, knowledge, and subjective norm explain 59.0% of the variance in customers' intention to adapt FinTech.

Table 3: Convergent Validity

Variables		Items	FL	A	CR	AVE
Attitude	ATT1	I believe using FinTech for my banking transactions is a good idea	0.741	0.893	0.918	0.652
	ATT2	The FinTech platform makes banking operations faster	0.867			
	ATT3	I will feel confident when I use FinTech for my transactions with the bank.	0.808			
	ATT4	FinTech will encourage me to transact online	0.834			
	ATT5	FinTech makes banking transactions more efficient.	0.767			
	ATT6	FinTech is user-friendly	0.821			
Awareness	AWR1	I am familiar with the benefit of FinTech services	0.782	0.834	0.876	0.541
	AWR2	I am aware of the importance of FinTech in conducting	0.698			

		banking activities				
	AWR3	I am not concerned about using FinTech services	0.744			
	AWR4	I have been exposed to the types of FinTech services	0.708			
	AWR5	I am not interested to use FinTech services at all	0.709			
	AWR6	I do not know much about FinTech services	0.770			
Knowledge	KNOW1	I have knowledge to use FinTech services	0.780	0.733	0.831	0.553
	KNOW2	I know it is better to use FinTech in conducting my banking activities	0.653			
	KNOW3	I am usually interested to know more about FinTech services	0.804			
	KNOW4	Using FinTech will provide opportunity to control my banking activities	0.729			
Subjective Norm	SUBJ1	My family believes that using FinTech will provide better banking services	0.821	0.744	0.833	0.558
	SUBJ2	My colleagues consider that using FinTech is convenient	0.790			
	SUBJ3	People around me use FinTech for their banking transactions	0.714			
	SUBJ4	My friends think that FinTech is better than traditional banking system	0.651			
Intention	INT1	I intend to use FinTech when conducting banking transactions	0.770	0.767	0.839	0.512
	INT2	I will be attracted to the bank that provides FinTech services	0.769			
	INT3	I will feel comfortable when I use FinTech services in the future	0.608			
	INT4	I strongly recommend the use of FinTech services	0.744			
	INT5	I am interested in using FinTech for banking transactions	0.672			

Notes: FL = Factor Loading, α = Cronbach's Alpha, CR = Composite Reliability, AVE = Average Variance Extracted, R^2 = Variance Explained

The value of outer loadings of the item less than 0.4 should not be considered for further analysis (Hair et al., 2014), whereas, the individual outer loadings of more than 0.7 are suggested to be retained in the model (Ali et al., 2018; Hair et al., 2017). Additionally, Hair et al. (2014) suggest that indicators' outer loading ranging from 0.40 to 0.70 is considered for

elimination only when indicator deletion increases the average variance extracted (AVE) value above the recommended threshold. The Cronbach's α coefficient which ranges from 0.733 to 0.893, and values within 0.831 and 0.918 for composite reliability (Table 3), suggest acceptable internal consistency of the data that we use in this study. The AVE value >0.50 is recommended (Ali et al., 2018; Hair et al., 2019). The outer loadings presented in Table 3 show that minimum loading is more than 0.40, AVE is greater than 0.50 and both Cronbach's alpha and composite reliability are above 0.70 and 0.80, respectively. Thus, convergent validity is confirmed for the latent variables.

4.3.2 Discriminant validity

Additionally, the outer model should meet the requirements of discriminant validity. Discriminant validity of the constructs is measured through different criteria, such as Fornell-Larcker criterion, and cross-loading of the indicator items (Hair et al., 2014). Due to some limitations of the cross-loading method and Fornell-Larcker criterion, Heterotrait and Monotrait ratios were introduced by Henseler et al. (2015). Consequently, we performed the HTMT (Heterotrait and Monotrait) ratio for confirmation of discriminant validity. The HTMT is the ratio of the item correlations across constructs to the average correlations for the items evaluating the same construct (Hair et al., 2019, p. 9).

Table 4: HTMT (Heterotrait and Monotrait Ratios)

	1	2	3	4	5
1. Attitude					
2. Awareness	0.166				
3. Intention	0.610	0.228			
4. Knowledge	0.752	0.331	0.648		
5. Subjective Norm	0.471	0.266	0.406	0.478	

Table 4 displays that the latent variables relationship has not crossed the suggested value of HTMT between 0.85 and 0.90 (Clark & Watson, 1995; Henseler et al., 2015; Teo et al., 2008). In this way discriminant validity of the constructs is satisfied.

Multicollinearity can be checked through vibrant correlation among the variables and HTMT (Yu, Jiang, & Land, 2015; Hair et al., 2019). The highest correlation between attitude and knowledge is 0.634 (see Table 2) which is lower than 0.70, so no multicollinearity exists in the variables (Yu et al., 2015). Besides, the HTMT ratio of the relationship is lower than 0.85, thus no multicollinearity problems are evident among the variables (Hair et al., 2019). Furthermore, we checked variance inflation factor (VIF) to ensure no multicollinearity between independent variables and the dependent variable. The highest VIF value was 1.787 which is lower than the 3.3 according to Hair et al. (2017, 2019), so no multicollinearity is present in this study's variables.

4.4 Assessment of structural equation modelling (inner model)

After reliable and valid outer model estimations were established, we advanced to the second step of PLS path model to evaluate the impact of independent variables on the dependent variable. In the structural model, relationships between intention (dependent variable) and

attitude, subjective norm, awareness, and knowledge (independent variables) were tested. To measure the statistical significance of the path coefficients, we use the path coefficient of the structural model (Table 6). Based on the results, attitude has a positive effect on customers' intention to adapt FinTech services (H1) with β = 0.286 for Malaysia and β = 0.210 for Saudi Arabia. Awareness has a positive effect on the intention to adapt FinTech services (H2) with β = 0.162 for Malaysia and β = 0.069 for Saudi Arabia and knowledge has a positive effect on the intention to adapt FinTech services (H3) with β = 0.260 for Malaysia and β = 0.297 for Saudi Arabia. Subjective norm also has a positive effect on customers' intention to adapt FinTech services with β = 0.147 for Malaysia and β = 0.155 for Saudi Arabia. Generally, the results show that all the variables have positive relationships with customers' intention for both countries, as such, *H1* to *H4* are supported. Furthermore, the parametric test shows that no hypothesis has a significant difference when comparing Malaysian and Saudi Arabian customers.

Table 5: The direct effects of independent variables on dependent variables and differences between Saudi Arabian (SA) Customers and Malaysian (MAL) Customers

No.	Hypothesis	β (Mal-Customer)	β (SA-Customer)	p-Values (MAL-Customer)	p-Values (SA-Customer)	β difference	p-Value (SA-Customer vs MAL-Customer)
H1	Attitude -> Intention	0.286	0.210	0.047***	0.122	0.075	0.704
H2	Awareness -> Intention	0.162	0.069	0.128	0.507	0.093	0.531
H3	Knowledge -> Intention	0.260	0.297	0.051	0.010***	0.037	0.834
H4	Subjective ->Intention	0.147	0.155	0.049***	0.066	0.008	0.945

Note: *p<0.001; **p<0.01; ***p<0.05; β= coefficient; SA=Saudi Arabia; MAL= Malaysia

More specifically, referring to Malaysian customers, attitude wields a significant influence on intention to adapt FinTech (β= 0.286, p<0.05) than the Saudi Arabian customers. The results indicate that Malaysian customers perceived FinTech to be faster, efficient, user friendly, and allow them to exert control over their transactions so they are willing to adapt it. Similarly, subjective norm was the second significant factor predicting Malaysian customers' intention to adapt FinTech (β= 0.147, p<0.05) but it is not the same for Saudi Arabian customers. This suggests that, for Malaysian customers, social influence can motivate them to be more interested in FinTech and more likely to perceive using it provided it is convenient and offers better banking services that meets their expectations. Furthermore, for Saudi Arabian customers', knowledge exerts a significant influence on intention (β= 0.297, p<0.05), while for Malaysian customers it does not. This means that Saudi Arabian customers largely perceive that having adequate knowledge about FinTech operational dynamics will make them control their banking activities easily.

5.0 Discussion

The aim of this study is to empirically investigate using the PLS-SEM technique factors that affect customers' intention to adapt FinTech. The factors are attitude, subjective norm, awareness, and knowledge. The study compares Malaysia and Saudi Arabia with a specific focus on Islamic bank customers. As shown in Table 5, the statistical analysis reveals that the

research model is acceptable. For Malaysia, in support of hypothesis 1, the result revealed that attitude exerts a positive and significant impact on customers' intention to adapt FinTech. This was consistent with previous studies as per Chuang et al. (2016) who found that attitudes reinforce an individual's intention to use FinTech products or goods/services, for example, in Taiwan and a willingness to embrace online banking services in Pakistan (Glavee-Geo et al., 2017). The findings suggest that when Islamic bank customers consider that using FinTech services will bring several benefits to them, such as convenience, fast service, user-friendliness, then they will exhibit positive attitudes and will shift from the traditional system of banking to the digital system due to updated expectations. Considering the trend in handling financial transactions today, many customers are curious and interested in using FinTech services. Hence, Islamic banking operators need to re-strategise, and promote its adoption through campaigns, workshops, seminars, and conferences and really emphasise the benefits of this innovative platform.

With respect to subjective norms, the findings reveal a positive and significant influence on the intention to adopt FinTech in Malaysia, thus, supporting hypothesis 2. These findings corroborate the previous results of similar studies, where subjective norms have been highlighted as exerting a positive impact on bank customers' intentions to adopt financial technology. Furthermore, social influence leads to using certain payment-type services, and customers' behavioural intention to adopt new technologies (Jerene & Sharma, 2020; Venkatesh, Morris, Davis, & Davis, 2003; Kim et al., 2016). This result implies that in this digital era, many Islamic bank customers will opt to accept FinTech for their transactions since their relatives or colleagues use it and they endorse it. Similarly, public opinion when reinforced by close associates could influence the decision to use the digital means of handling financial transactions. Thus, since experience of FinTech services users could pose confidence in others to use these services, the Islamic banking sector should create a conducive environment, one in which customers from whom others will obtain information will have a good experience in conducting financial transactions using digital platforms.

Furthermore, in support of hypothesis 3, this study affirms knowledge has a positive and significant effect on Saudi Arabian Islamic banking customers' intention to adapt FinTech. Our results supported the previous findings where evidence shows that having specialised knowledge (Lee & Shin, 2011), or financial knowledge (Carlin, Olafsson, & Pagel, 2017) is important in shaping decisions or intentions to adopt FinTech or use mobile banking services. Similarly, a study conducted by Lumby, Browning, and Finke (2017) shows that knowledge is important in persuading people to adopt or reject new insurance policies. The findings suggest that having the requisite knowledge on the modalities of FinTech is likely to lead to an increased level of curiosity, confidence, and patronage among customers of Islamic banks, which would further strengthen the activities and performance of the Islamic banking industry. Therefore, the Islamic banking industry needs to put more effort into not only understanding the characteristics of diverse customers, but also avail them with the necessary information to further increase their knowledge level. This is especially the case concerning the significance and benefits of using a digital platform which in turn increases overall rates of adoption.

The comparative position demonstrated similar results on the level of awareness among Islamic bank customers in both countries. Although the intention of Malaysian and Saudi Arabian customers is positively linked to awareness, this appears not to significantly influence the level of people's awareness about FinTech. This finding could be due to the fact that FinTech has achieved higher acceptance, and many bank customers are becoming more experienced in using technological means to perform financial transactions. This is in addition to government support and the growing interest in the FinTech market which has created

unique opportunities for bank customers and operators. Hence, customers are now more conscious and interested in using FinTech as long as it can meet their expectations in terms of financial services and is not disruptive. This outcome is supported by previous studies which emphasised the importance of awareness in influencing customers' intention (Saksonova & Kuzmina-Merlino, 2017; Ramdhony, 2013; Wan Ahmad, Hanifa & Kyo, 2019).

6.0 Conclusions

Financial technology represents a new trend in banking service delivery, creating a high degree of disruption for the banking industry. Online payment, digital currency, regulatory sandbox, as financial technology tools, are changing ways of doing business and means to increase customers banking experience. In many ways, customers play key roles in promoting this emerging market. Therefore, it is important to ensure that Islamic banking customers are encouraged to use the digital platforms. To provide an enabling environment to foster the adoption of FinTech, many Muslim countries including Malaysia and Saudi Arabia have launched regulatory frameworks to enhance digital transformations. This study investigates Islamic banks customers' perceptions about FinTech and analyses the determinant factors for its acceptance. Based on the data analysis and discussion of findings, the study highlighted some important factors that can prompt customers' adoption of FinTech and strengthen Islamic banking operations. More precisely, to improve customers' perceptions and increase their patronage, Islamic banking industry should leverage on customers' positive attitudes toward FinTech. Social reference is a significant determinant of FinTech adoption. Also, this study found that when customers knowledge of FinTech is adequate, the likelihood to adopt it is high. Awareness demonstrates a moderately positive effect on customers' intention toward FinTech, thus, Islamic banking operators/management should intensify more in this direction especially in countries where FinTech is still considered an innovative concept.

Theoretical Implications: From a theoretical viewpoint, the integration of the TRA and the TPB as the theoretical framework of this study enriches and deepens the existing body of knowledge on financial technology by providing a better empirical understanding of the significant factors that drive customers' adoption intention. It also contributes to the literature by examining and providing valuable insight on customers' perception of FinTech from two emerging economies. Only a few studies have been considered in this area especially from a comparative perspective. Furthermore, the study is apt to explain customers' reactions to evolving technologies, particularly in the Islamic banking context, whilst also providing policy guide to banking operators.

Practical Implications: In terms of policy implications, the findings of the study provide some empirical evidence on the key determinants of customers' behavioural intention toward FinTech in emerging economies. The results show that the intention of Islamic banks customers to adapt financial technology is strongly influenced by attitude, knowledge, subjective norm, and awareness. First, policymakers and senior management of Islamic banks must work on formulating appropriate policy interventions targeted at meeting the expectations of every customer. This will enable Islamic banks to penetrate the new technology market leveraging on positive attitude of customers towards FinTech. Second, the study emphasises the importance of knowledge in shaping customers' intention to use FinTech services. Thus, to promote inclusiveness and be swift in taking up increasingly digitised financial services, senior/executive management and banking operators have a huge task in encouraging and supporting capacity-building by investing in their personnel through training, seminars and conferences. This might help to increase service delivery and improve perceived image of the bank. Third, Islamic bank managers should acknowledge the importance of referent and social groups in advancing innovative activities and making their

financial institution competitive in the banking industry. This will strengthen and help to develop the banking sector especially in Muslim dominated societies.

Limitations and Scope of Future Research: This study does have some limitations. The respondents are limited to Islamic banks customers in two countries - Malaysia and Saudi Arabia. Therefore, future research should include many other stakeholders in the finance industry. This may help to generate better results especially when it is extended to other regions. Additionally, future studies could consider the impact of demographic variables including age; gender; education; and income level. This will provide useful insights across different strata. Furthermore, although the data was collected using a questionnaire survey, it would be more robust if interviews were included. Data analysis was heavily based on the quantitative method, so utilising other analytical techniques or combining them will provide comprehensive evidence for validated results.

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