Assessment of Prospect Towards Cashless Society: A Case of Mobile Payments in Emerging Markets

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Abstract

Due to the rapid rise of communication innovation technologies, mobile payments system can be considered as one of the fast-growing business opportunities by both academics and practitioners. A case in point, financial technology has contributed dramatically to an increase of mobile payments in many sectors, e.g., banking, commerce, retails, as well as in many countries (both advanced markets and emerging markets). However, each country has its own growth rate pattern in mobile payments. The puzzle is why there are different growth rate patterns when such financial technology is now available and affordable in emerging markets. And why there is less adoption of mobile technology in emerging markets. The literature on mobile payments is a shortcoming in many aspects. A case in point, the Technology Acceptance Model (TAM) and its extent are too parsimonious for explaining adoption in technology across markets, especially in some emerging markets. This paper, thus, examines the progress toward a cashless society by focusing on a different pattern of growth of mobile payments and an adoption of mobile technology in emerging markets. This study proposes a new integrated and comprehensive model to explain such different growth rate pattern to fill the literature gap and contribute to the existing literature. To better explain and predict such different growth rate, a model should include more variables such as macroeconomic and social factors. For instance, digital inequality, personal affordability, infrastructure or digital policy. Nonetheless, the limitation of the proposed model will be a case of data availability.

Keywords: Cashless Society, Mobile Payments, Mobile Technology, Emerging Market

Introduction

The rapid innovation in financial technology has significantly contributed to a transformation of the banking industry in many aspects, especially in electronic payment or digital payment. A financial technology has contributed to a dramatic increase in mobile payments. Statista.com reported that the total transaction value in the Digital Payment (Mobile POS Payments and Digital Commerce) segment amounts to US$ 3,168,158 million in 2017 and increased to US$ 4,137,523 million in 2019 (Statista.com, 2020). In the Global comparison, the top 5 of mobile payment are China, United States, United Kingdom, Japan and Germany respectively. Noteworthy, the Mobile POS Payment was only accounted for US$ 368,614 million out of the total in 2017 and US$ 745,796 million out of the total in 2019. For Thailand,

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the mobile payments (both banking institutions and non-banking institutions) increased from 801, 572 baht in 2010 to 3,110,467.69 baht in 2017 according to Bank of Thailand Report. However, cash still accounts for 85% of all consumer transactions throughout the world and cash accounts for 40% or more of all consumer transactions in many emerging markets in 2013 according to MasterCard.com. More importantly, the device like mobile phones becomes a choice of customer for banking, payments and shopping (Lin, 2011). As a result of combination factors of the availability of technology enable smartphone and the strategic of mobile-centric clients by banking industries, the mobile banking has able to offer from basic text message alerts to a sophisticated fully functional banking experience.

Furthermore, a rapid innovation by banking industry has made such advanced financial technology available in both advanced industrialized countries and developing countries. The data show that there is such different level of growth in using electronic payment. The puzzle is what inhibiting an individual not taking advantage of seemingly convenience and cost saving activities like mobile payment or mobile banking.

There is a few literature on mobile technology or mobile payments when compared to other related fields. Most studies illustrate the relationship between customers' behavioral intention to use mobile banking (Aboelmaged & Gebba, 2013; Hanafizadeh & Khedmatgozar, 2012; Laukkanen, 2016; Safeena, 2012; Zhou, 2011). To explain the relationship, the literature is mainly employed on a decision-making process of an individual to examine of adoption of information technology. For instance, a number of studies examine customer adoption for information technology (Alalwan, Dwivedi & Williams, 2016; Zhang, Jahromi & Kizildag, 2018). Furthermore, the literature review shows that majority of prior research has employed the Technology Acceptance Model (TAM) (Davis, 1989; Chan & Lu, 2004; Tavilla, 2015); and later Unified Theory of Acceptance and Use of Technology 2 (UTATUT2) Model (Brown & Venkatesh, 2005; Zhang, Jahromi & Kizildag, 2018). Those studies is able to explain on how and why an individual chooses to adopt such payment method. However, this paper asserts that a study should also focus on other essential matters that relate to a growth of adopting of mobile payment in other emerging markets. Previous studies do not shed the light on the pressing issue in both a policy making decision world and a business strategy world.

As a consequence, this paper proposes that we should 1) Take a different methodological approach and 2) Include a more variables with a different theoretical framework in order to understand and explain a different progress that being made. First, a unit of analysis should be an emerging market, not just an individual. Simply put, one should consider a macro view in a case where the same and similar technology is available to use. Second, a proposed theoretical framework in this study is called a push-pull theoretical framework. The framework will separate related factors into two groups. The first group is the pull factors which refer to variables from a business side sector e.g., TAM factors or UTATUT2 factors. The second group is the push factors that consider variables from a government sector (e.g., macroeconomic and social indicators). Thus, the model include more variables in order to better explain and predict the different growth rate.

This paper will proceed as follows. The first section briefly identifies and reviews the empirical and theoretical works from a literature on TAM and its extent on technology adoption. The second section discusses a more inclusive and comprehensive approach. And the final section discusses the implications of a proposed approach that can have for future research.

Determinant Factors: A Brief Literature Review

This section will identify related studies to illustrate the point that an individual approach adopted as a unit of analysis can be the majority found in the literature to explain the emergence

of a cashless society. Most of studies focus on a pull factor. Factors build on customer satisfaction or increase incentive in order to influence customer loyalty. The problem is by not including other potential accelerated factors, which will lead to omitting variable bias in the model. In this section, the existing literature that employs traditional technology acceptance model (TAM) will be discussed first and then follows by a discussion of Unified Theory of Acceptance and Use of Technology 2 (UTATUT2) Model. In this paper, those mentioned factors are considered as pull factors, which come from a business side. Such factors consider to facilitate customers' electronic payments.

Furthermore, the literature on a vision of the emergence of "cashless/checkless society" can be traced as far back as in 1960s. The idea of transformation of business transaction, for instance, can be found in the study in titled "The Coming Cashless Society" (Reistad, 1967). Reistad (1967) has a vision that a society will become "checkless/cashless" in a sense of checks, credit cards, or perhaps cash being replaced by one bank ID card that would unlock one's bank account and because of an innovation develop in a banking industry. The use of mobile banking can be traced in 1990s. A prospect and a progress of becoming a cashless society have come so far long since then. To understand the process of becoming a cashless society, one cannot do without examining the adoption of mobile banking or mobile payments. The adoption of mobile payments can be considered as a first step of becoming a cashless society because there is an increase using of mobile devices by consumers' everyday lives, especially, banking, shopping, socializing and entertainment. Subsequently, the innovation and technology development has lead us to an era of electronic payment, especially a financial technology enables mobile banking. To explain determinant factors that lead to an adoption of technology, the traditional Technology Acceptance Model (TAM) seems to be a preference choice of the method for many studies since it was first introduced by Davis in 1989. TAM has played an important role in explaining who will adopt digital banking and why. The premise of the model is perceived usefulness, and perceived ease of use are considered as effective factors in influencing consumers to adopt mobile technology. Several authors conclude that TAM can affect an adoption of digital banking, and security also seems to play an important role in making decisions (Alalwan, Dwivedi & Williams, 2016; Zhang, Jahromi & Kizildag, 2018)

Unlike prior studies, the current literature is found an increase in the use of Unified Theory of Acceptance and UTATUT2 Model. To examine factors that influence customers to adopt mobile banking, several authors focus on several factors such as (e.g., mass media, security, self-efficacy, hendomic motivation, price value, habit, and trust) and in many countries (Brown & Venkatesh, 2005; Gupta, Dasgupta & Gupta, 2008).

To study predicting factor on mobile payments adoption in emerging markets, we need to consider the characteristic that differentiate emerging markets from those developed markets. Some factors differentiate emerging markets from those developed markets. This study, thus, suggests that we need to include additional variable such as digital inequality, internet usage and infrastructure which will be further discussed in the next section

This study asserts that by including additional variables, the model is expected to explain and predict a growth rate in mobile payments better.

The use of Information and Communication Technologies (ICTs) has become a vital factor for social and economic development. Consequently, the dependent variable of the availability of ICTs for people can be considered as a key factor for generating business growth, especially in mobile payments. In some cases, the accessing and using technology is becoming more or less privileged to many different groups of people. Such technology gap refers to as a digital divide. The Organization for Economic Co-operation and Development (OECD) defines the digital divide as the 'gap between individual, households, business, and geographical areas at different socioeconomic levels with regard both to their opportunities to access ICTs and their use of the Internet for a wide variety of activities (OECD 2001). The definition shows that

digital divide can be considered as a complex and multidimensional process. To simplify, the variable digital inequality (DIGIIN), in this study, will be a measure of directly associated with users' characteristics like the mobile internet access and literacy skills. Especially, the mobile internet access for underprivileged groups, and for rural and low-income areas.

Because of the implication of digital capital that carrying over pre-existing differences in human capital into online setting, this digital inequality variable plays a key role in a range of outcomes, from academic performance to labor market success to entrepreneurship to health service uptake (Stiakakis, Kariotellis & Vlachopoulou, 2009). Thus, this study expects the digital inequality to play similar important role in explaining the adoption of mobile payments. Many studies consider network infrastructure to be the most determinant factor of ICT diffusion (Barclay & Evan, 2008; Selhofer & Husing, 2002; Stiakakis, Kariotellis & Vlachopoulou, 2009). This study also include a variable that measure of network infrastructure.

As for a AFFORD variable, the measurement of such variable is far more complex than other variables because this study will measure a level of income by establishing threshold for affordability. Most studies are based on a measurement of people living on less than $1 per day—the international standard for extreme poverty. This study will adopt such international standard as a guideline for measurement of an affordability variable which offered by the World Bank. Moreover, political and regulatory environment variable is a measurement of the national legal framework facilitates ICT penetration and a safe development of business activities which can be found in the World Bank's Doing Business 2020: Comparing Business Regulation in 190 Economies.

Furthermore, this study also asserts that those additional factors should be considered as significant factors to indicate how a country is moving toward a cashless society.

Methodology

Model

As this paper discusses in the previous section on how business side factors or pull factor explain the adoption of technology. The puzzle still remains unanswered. This study aims to emphasize the importance of push factors, which are macroeconomic and social indicators building on the past extension to the UTATUT2. As mentioned in a previous section, the mobile device has become part of everyday lives, for many in doing broad range activities. Thus, we cannot have a cashless society until we have a better understanding of why there are several people still prefer to use cash as a method for transactions when there are so many benefits and perks associate of going digital. One explanation is an affordability to own an internet-enabled smartphone and internet access. Another explanation is the lack of digital literacy. Thus, this study asserts that we need to include a push factors in the model to explain a different growth pattern of the use of digital banking in emerging markets.

This study proposes the economic model that estimated as a linear panel model (also known as longitudinal or cross-sectional time-series data) with random effects and shown below. By using this type of estimate model, the analysis can account for individual heterogeneity because it controls for variables that cannot observe or measure variables that change over time but no across entities. Moreover, such model can include variables at different levels of analysis for further advance analysis to employ multilevel or hierarchical model. Furthermore, there are some drawbacks with an issue of, for example, a correlation between countries. Nevertheless, the proposed estimated econometric model is considered to be more appropriated and comprehensive after considering all the advantage and disadvantage factors.

The baseline equation for random effects model is:

$$Y_{it} = \beta X_{it} + \alpha + \mu_{it} + \varepsilon_{it}$$

Where

Y_{it}	is the dependent variable (DV) where I = entity and t = time.
X_{it}	is independent variable (IV).
β	is the coefficient for that X_{it}.
μ_{it}	is the between-entity error term.
ε_{it}	is the within-entity error term.
α (i = 1…n)	is the unknown intercept for each entity.

The estimated model is using time and an emerging market effects because the heterogeneity and characteristics of each market consider to be significant. In other words, the estimated model is a cross-market model with market-specific characteristics. The model attempts to measure the magnitude relative emerging of the cashless society process by using the absolute magnitude of total mobile payments.

The expected model is:

$$MOPAY_{it} = B_0 + B_1 x\ DIGIIN_{it} + B_2 x\ INFRAS_{it} + B_3 x\ AFFORD_{it} + B_4 x\ POREG_{it} + \alpha + + \mu_{it} + \varepsilon_{it}$$

Where

$MOPAY_{it}$	is total mobile payments where subscript i = entity and t = year.
X_{it}	are
DIGIIN	is a measurement of digital inequality.
INFRAS	is a measurement of network infrastructure for mobile device.
AFFORD	is an affordability to ownership of an internet enabled Smartphone, internet access.
POREG environment*	is Political and Regulatory.

The purpose of model is to illustrate push factors provide the crucial link in understanding how each variable promotes the adoption of mobile payment. For example, to how the lesser level of digital inequality increase the probability of a mobile payment adoption. The dependent variable, labeled MOPAY, is the total mobile payment at country level by year.

This study expects all push variables (labeled DIGIIN, INFRAS, AFFORD) to be positively and statistically significant affected the level of mobile payments, especially the digital inequality variable. To ensure the robustness of any significant relation between the push factors and the adoption of mobile payment, this study adds series of control variables to the baseline regression model. This study considers to include variables (consumer behavior, digital disruption, or marketing campaign) to control for business conditions that might contribute to the adoption of mobile payment. This study also employs exploratory factor analysis (EFA) to detect and test structure in the relationship between variables, identify factors and classify variables. In addition, a number of methods will be employed to ensure robustness of the model.

Conclusion

In conclusion, a model should include variables from more than one discipline in order to close the gap in the literature in explaining differences of the growth rate of mobile payments

in emerging markets. A study on such topic should not omit important variables from push side factors, for instance, digital inequality, personal affordability, infrastructure or digital policy. A study that investigates a reason for adoption of mobile technology cannot explain the topic by only focusing on Technology Acceptance Model (TAM) or the Unified Theory of Acceptance and Use of Technology 2 (UTATUT2).

Simply put, this study anticipates results of the proposed model will shed light on the factors that shape a country's response to its infrastructure needs and certain economic inequalities and offer policy implications for facilitating the removal of any inadequacies that prevents a country from accelerated in mobile payment rate. In other words, this study will help us understand the conditions when push factors to produce a mobile payment adoption.

Moreover, the world event can also, in some cases, consider a push factor that should not overlook, like a recent case of the COVID-19 pandemic. The fact that certainly will create a certain new norm for some but not matter for all. Whether the COVID-19 is going to be just another wave (a push factor) that temporary increases the volume of mobile payment transactions or is going to permanently define this period as a significant progress that moves us toward closer to a "cashless society". This discussion remains open.

Finally, the limitation of this proposed model is availability of data (e.g., panel data) at a country level. Thus, a predicted model of "cashless society" will currently yield inconclusive result.

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