



M-BANKING AND THE MICROCREDIT AUDIENCE: a study based on the UTAUT 2

M-BANKING E O PÚBLICO DO MICROCRÉDITO: um estudo com base na Teoria UTAUT 2

M-BANKING Y LA AUDIENCIA DEL MICROCRÉDITO: un estudio basado en la UTAUT 2

ABSTRACT

Purpose: Small entrepreneurs have difficulty accessing credit, but they can be served with microcredit lines through digital channels, such as mobile banking (MB). The present study aimed to measure the impact of antecedent factors (performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit) on the intention and behavior of MB use by the urban microcredit public, and to identify whether the relationship between intention and use is moderated by factors such as age, gender and experience.

Design/methodology/approach: A survey was conducted and included 470 respondents, small entrepreneurs with income up to BRL 200 thousand. For data analysis, the structural equation modeling technique was used for hypothesis testing and CFA to assess the convergent validity and accuracy of the measurement model.

Findings: The results found were that the habit, the facilitating conditions and the social influence positively influence the intention to use MB. In addition, the intention to use is a strong predictor of the usage behavior of MB and this relationship can be moderated by the user experience, that is, the more experiences the small entrepreneur has, the more likely he will be to incorporate the use of the MB.

Originality/value: Understanding the factors that influence the intention and behavior of the use of MB by the public of urban microcredit is essential to act in solving obstacles and generating stimuli on the part of financial institutions and promoting development. The research was innovative by studying the behavior of using a technological tool with an audience that is difficult to access.

Keywords: M-banking. UTAUT 2. Consumer Behavior. Banking Technology.

RESUMO

Objetivo: Pequenos empreendedores têm dificuldade de acesso ao crédito, mas podem ser atendidos com linhas de microcrédito através de canais digitais, como o *mobile banking (mb)*. O presente estudo teve como

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objetivo medir o impacto de fatores antecedentes (expectativa de desempenho, expectativa de esforço, influência social, condições facilitadoras, motivação hedônica, relevância do preço e hábito) na intenção e no comportamento de uso do *mb* pelo público do microcrédito urbano, e identificar se a relação entre intenção e uso é moderada por fatores como idade, gênero e experiência.

Design / metodologia / abordagem: Uma *survey* foi aplicada e contou com 470 respondentes, pequenos empreendedores com renda até R\$200 mil. Para a análise dos dados foi utilizada a técnica de modelagem de equações estruturais para o teste de hipótese e AFC para avaliar a validade convergente e precisão do modelo de mensuração.

Resultados: Os resultados encontrados foram que o hábito, as condições facilitadoras e a influência social influenciam positivamente a intenção de uso do *mb*. Além disso, a intenção de uso é um forte preditor do comportamento de uso do *mb* e essa relação pode ser moderada pela experiência do usuário, ou seja, quanto mais experiências o pequeno empreendedor tiver, mais propenso ele será a incorporar o comportamento de uso do *mb*.

Originalidade / valor: entender os fatores que influenciam a intenção e o comportamento de uso do *mb* pelo público do microcrédito urbano é essencial para atuar na resolução de entraves e geração de estímulos por parte das instituições financeiras e de fomento ao desenvolvimento.

Palavras-chave: *M-banking*. UTAUT2. Comportamento do Consumidor. Tecnologia Bancária.

RESUMEN

Objetivo: Los pequeños empresarios tienen dificultades para acceder al crédito, pero pueden ser atendidos con líneas de microcrédito a través de canales digitales, como la banca móvil (*mb*). El presente estudio tuvo como objetivo medir el impacto de los factores antecedentes (expectativa de desempeño, expectativa de esfuerzo, influencia social, condiciones facilitadoras, motivación hedónica, relevancia del precio y hábito) sobre la intención y el comportamiento de uso de *mb* por parte del público urbano microcrédito, e identificar si la relación entre intención y uso está moderada por factores como la edad, el género y la experiencia.

Diseño / metodología / enfoque: Se aplicó una encuesta en la que participaron 470 encuestados, pequeños empresarios con ingresos de hasta R \$ 200 mil. Para el análisis de datos, se utilizó la técnica de modelado de ecuaciones estructurales para la prueba de hipótesis y AFC para evaluar la validez convergente y la precisión del modelo de medición.

Recomendaciones: Los resultados encontrados fueron que el hábito, las condiciones facilitadoras y la influencia social influyen positivamente en la intención de uso del *mb*. Además, la intención de uso es un fuerte predictor del comportamiento de uso de *mb* y esta relación puede ser moderada por la experiencia del usuario, es decir, cuantas más experiencias tenga el pequeño emprendedor, más probable será que incorpore el comportamiento de uso del *mb*.

Originalidad / valor: Entender los factores que influyen en la intención y comportamiento del uso de *mb* por parte del público del microcrédito urbano es fundamental para actuar en la resolución de obstáculos y generar estímulos por parte de las instituciones financieras y promover el desarrollo. La investigación innovó al estudiar el comportamiento del uso de una herramienta tecnológica con una audiencia de difícil acceso.

Palabras clave: *M-banking*. UTAUT2. Comportamiento del consumidor. Tecnología bancaria.

INTRODUCTION

The World Bank's Global Findex (2018) points out that the future of access and use of financial services will be digital and that mobile banking (hereinafter MB) emerges as the main digital channel. In this sense, several studies have been developed with this theme (Alalwan, Dwivedi, & Rana, 2017; Baabdullah, Alalwan, Rana, Kizgin, & Patil, 2019; Berraies, Ben Yahia, & Hannachi, 2017; Choudrie, Junior, McKenna, & Richter, 2018; Farah, Hasni, & Abbas, 2018; Haider, Changchun, Akram, & Hussain, 2018; Ramos, Ferreira, Freitas, & Rodrigues, 2018; Singh & Srivastava, 2018). However, small, low-income entrepreneurs who do not have real guarantees to offer financial institutions have difficulty accessing credit (Yunus & Jolis, 2000), constituting a differentiated population, marginalized in relation to the financial system and little studied in terms of behavior in using MB technology.

Researching the antecedent factors to MB usage behavior among the microcredit audience is relevant, since productive microcredit plays an important role in promoting economic development and imperfect financial systems make it difficult for people without sufficient assets to finance their projects, interfering in business decisions and, consequently, in the economic and social development of their countries (Koku, 2015; Matos, Macambira, & Cacciamali, 2014).



To address this topic, the approach chosen was the Unified Theory of Acceptance and Use of Technology in an extended form (UTAUT 2) created by Venkatesh, Thong and Xu (2012) which was specifically proposed to clarify technology acceptance from the customer's perspective and is one of the most used theories in research on the use of MB, according to Shaikh and Karjaluoto (2015).

The object of study of this article is the usage behavior of the most used tool for financial transactions, mobile banking, together with a specific and important niche in the market, the microcredit audience. And it aims to measure the impact of antecedent factors (performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit) on the intention and behavior of using MB by the urban microcredit public, and identifying whether the relationship between intention and use is moderated by factors such as age, gender and experience.

The seminal UTAUT 2 paper, by Venkatesh *et al.* (2012), suggested expanding research with other technologies and in other populations. Shaikh and Karjaluoto (2015) pointed out a lack of research that relates microfinance and MB, particularly in developing economies. In addition to bringing research into MB technology in a developing country context, the main contribution offered by this research is the application to a specific audience whose characteristics are entrepreneurs with low income and education and who are accustomed to traditional service through credit agents, physical agencies and cash transactions.

The development of this study can bring benefits to financial institutions, as by measuring the factors influencing the intention and use of MB by the microcredit public, understanding their behavior, such organizations will be able to act to resolve marketing obstacles and stimuli, gaining scale and efficiency, both with clients already related to the institutions and with potential clients (Tam & Oliveira, 2017).

Still as a practical justification, this article can contribute to expanding access to productive microcredit for small, low-income entrepreneurs through MB and, consequently, economic and social development, as there is still a large market without access to financial products and services

suited to their needs, mainly in the informal sector of the economy (Crocco, Santos, & Figueiredo, 2013; Koku, 2015; Matos *et al.*, 2014).

THEORETICAL FRAMEWORK

Microcredit and Mobile Banking

In 2006, Bangladeshi economist Muhammad Yunus received the Nobel Peace Prize and shared with the world his good practices and microcredit results with Grameen Bank (Yunus & Jolis, 2000), which proposed the use of microcredit to reach the most disadvantaged classes, combating poverty by developing the innate qualities of individuals, serving as a model for various institutions around the world and being the subject of several academic studies.

In this work, the delimitation regarding microcredit is restricted to granting credit to entrepreneurs in small economic activities who find it difficult to obtain adequate credit from financial institutions. Service is provided in a traditional way by credit agents and, generally, in solidarity groups; it therefore has a strong impact on reducing poverty and generating income (Barone, Lima, Dantas, & Rezende, 2002; Caçador, 2014; Gonzalez, Righetti, & Di Serio, 2015; Khandker, 2005).

Due to the importance of microcredit, Brazilian legislation has been encouraging financial institutions to operate in this segment. In 2005, the National Guided Productive Microcredit Program was created and, in 2018, Law no. 13,636 (Brazil, 2018) redefined the concept of productive microcredit established in Law no. 11,110 with an important addition: admitted the use of digital and electronic technologies that can replace face-to-face contact, in an attempt to expand access to credit through digital channels. It also established, as a target audience for microcredit, entrepreneurial individuals and legal entities that develop urban and rural economic activities and that have annual income or gross revenue of up to BRL200 thousand. This is the microcredit audience that will be the subject of this study, however restricted to the urban sector.

The banking sector, in which microcredit is inserted, has evolved rapidly with advances in technology, customer demands and competition between banks (Koksal, 2016). New technologies and business models in the financial system



enable cost reduction and greater reach of financial services, enabling a new scenario in which financial citizenship is truly possible (Bader & Savoia, 2013). In addition to the potential for cost reduction, MB allows customers to carry out their transactions wherever and whenever they want without the need for bank employees or trips to branches (Alalwan, Dwivedi, Rana, & Williams, 2016; Koksal, 2016).

The growth of the MB channel in Brazil has been exponential in recent years, in 2012, transactions per MB did not reach 1.5% of total banking transactions in Brazil and internet banking led customer preference with 38.5%, followed through ATMs (automated teller machines) with 24.7% of transactions. MB's share was the lowest among all channels. In 2016, MB transactions surpassed all other service channels, reaching 27% and, on a growth trajectory, in 2020, it was consolidated as the most used channel, with 52.6 billion transactions, which corresponds to 50% of total banking transactions carried out. The 41.4% growth from 2020 to 2019 was impacted by the Covid-19 pandemic, when online transactions were prioritized (Brazilian Federation of Banks, 2021).

Regarding the benefits of the MB channel, Tam and Oliveira (2017) described additional advantages for customers, such as reduced time and expenses. And for small, low-income entrepreneurs, who generally work alone or with family labor, leaving the business to go to the bank and face queues is a critical point.

In relation to financial institutions, the MB channel offers cost savings, attracting new customers and retaining old ones. Enables financial institutions to cross-sell and upsell their financial products and services, such as vehicle financing, credit cards, etc. Furthermore, it helps financial institutions improve service operational efficiency, customer satisfaction and cost effectiveness (Tam & Oliveira, 2017).

In a literature review article on the adoption of MB, Shaikh and Karjaluoto (2015), the average sample size was 365 consumers. They identified 11 adoption theories and models, but the most used were the Technology Acceptance Model, the Diffusion of Innovation Theory and the Unified Theory of Acceptance and Use of Technology. Tanto Shaikh e Karjaluoto (2015), as for the bibliographical review of Tam and Oliveira (2017)

identified the prevalence in academic studies on MB throughout the world of the dependent variables: Intention and Use, both originating from social psychology.

New Technology Adoption Model

Among the three most used theories in research on MB, according to Shaikh and Karjaluoto (2015), is UTAUT, initially proposed by Venkatesh, Morris, Davis and Davis (2003), which is a consolidation of constructs, a unified model of eight relevant theories widely used to understand the acceptance and use of technologies. In addition to the two theories TDI and TAM, the authors integrated elements of the Theory of Reasoned Action, the Motivational Model, the Theory of Planned Behavior (TPB), the Combined TAM and TPB Model, the Personal Computer Use Model and Social Cognitive Theory. The UTAUT authors used four key constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) influencing the intention and behavior of using technologies.

The constructs used as moderators in the initial theory were age, experience, gender and voluntariness of use. Aimed at the corporate environment, UTAUT initially aimed to provide a tool for managers who need to evaluate the perspective of the results of new technologies and help understand acceptance drivers to carry out training and marketing interventions, aimed at users less inclined to use technologies (Venkatesh, Morris, Davis, & Davis, 2003). In this way, the theory's initial focus on users less inclined to use technology is very similar to the microcredit audience to be studied in this research.

In 2012, Venkatesh *et al.* (2012) developed UTAUT 2, extending and adapting the model to the consumer context and inserted three new constructs: hedonic motivation, price value and habit. The moderating variables that influence the constructs are now only age, gender and experience, with voluntariness of use having been excluded, due to the change from the corporate context to that of the client, where motivation is intrinsic.

UTAUT 2 is a more up-to-date and unified model of eight relevant theories that has been specifically proposed to shed light on technology acceptance from the customer's perspective, had



high explanatory power in relation to intention to use (74%) and usage behavior (52%) in Venkatesh *et al.* (2012) and has been successfully tested in several articles (Alalwan *et al.*, 2017; Baabdullah *et al.*, 2019; Baptista & Oliveira, 2015; Bhatiasevi, 2016; Farah *et al.*, 2018; Martins, Oliveira, & Popovic, 2014; Tan & Lau, 2016; Yaseen & Qirem, 2018).

Furthermore, the results of the systematic literature review study by Tamilmani *et al.* (2021) revealed that UTAUT 2 is a robust, high-quality theory and plays a central role in technology adoption research, the theory is widely used in research on various types of technologies, with emphasis on mobile, and among different audiences, having already obtained more than 6,000 citations on Google Scholar. Malik (2020), which reviewed research on mobile and internet banking in developing countries, also proved the predictive capacity of the UTAUT 2 model.

Performance Expectancy

Performance expectancy was originally conceptualized as the degree to which an individual believes that the application of technology will help one achieve job performance gains (Venkatesh *et al.*, 2003). In the context of customers, it is the extent to which a user believes that using MB will provide benefits in performing financial services, as per Baptista e Oliveira (2015).

In the context of the urban microcredit audience, in which the enterprises are small, the absence of the entrepreneur to perform banking services commonly results in the suspension of the enterprise's activities and should raise performance expectancies in the use of technology. Therefore, considering several studies that identified the strong relationship between performance expectancies and the intention to use the MB (Marpaung *et al.*, 2021; Alalwan *et al.*, 2017; Baabdullah *et al.*, 2019; Baptista & Oliveira, 2015; Bhatiasevi, 2016; Farah *et al.*, 2018; Martins *et al.*, 2013; Tan & Lau, 2016), The first hypothesis tested in this study was:

H1: Performance expectancies positively influence the behavioral intention to use MB.

Effort Expectancy

Originally conceptualized by Venkatesh

et al. (2003), based on the perceived ease of use construct of TAM, effort expectancy is the degree of ease associated with using a technology or system. For Alalwan, Dwivedi and Rana (2017), customers seem to worry about the extent of simplicity or difficulty in using MB. In the context of MB and, more specifically, the audience of low-income microcredit entrepreneurs, the degree of ease may be more significant.

In a study on the use of e-banking (internet banking services) in Jordan, Yaseen and Qirem (2018) proved that effort expectancy is a significant predictor of intention to use the service. Farah, Hasni and Abas (2018) conducted an empirical study on the most important factors that help explain MB usage intention and behavior in Pakistan and also found effort expectancy as a positive predictor of MB usage intention, Consumers are increasingly looking for technologies that simplify their activities with little effort. Given the evidence presented so far, that the greater the effort expectancy, the greater the intention to use, the second hypothesis tested in this study was:

H2: Effort expectancy positively influences the behavioral intention to use MB.

Social Influence

Within the context of MB, Alalwan *et al.* (2017) conceptualized social influence as the influence of the surrounding social environment on customers' intention to adopt mobile banking; information and incentives provided by people around customers can contribute to customers' awareness and intention toward technology.

The study by Makanyeza (2017) on the adoption of MB in Zimbabwe by Marpaung *et al.* (2021), in relation to customers of the Mestika bank, in Indonesia, found that social influence has a positive effect on behavioral intention. The influence of a collectivist society, with extended families and family attachment was also found by Bhatiasevi (2016), in Thailand. The implication of this is that the more consumers believe that the people who are important to them (such as friends, family, and co-workers) would approve of using mobile banking services, the more likely they would be to adopt a new technology (Martins *et al.*, 2013). Thus, the following hypothesis was created:



H3: Social influence has a positive relationship with the behavioral intention to use MB.

Facilitating Conditions

According to Baptista and Oliveira (2015), the use of MB services requires some skills, such as using a cell phone, internet connection, the installation of applications, as well as knowledge about service and security operators. Users who have access to tutorials, demonstrations and online chat will have a greater intention to use MB.

About the adoption of MB in Jordan, Alalwan *et al.* (2017) empirically demonstrated the considerable influence of facilitating conditions on the adoption of MB services, demonstrated that customers have a particular interest in the existence of resources to be made available by companies to use mobile banking services. As a technology considered new, customers need support and training, as well as financial applications that can be adapted to their needs and that are compatible with other applications they already use (Baabdullah *et al.*, 2019). Based on previous studies and the characteristics of the audience of low-income microcredit entrepreneurs, it is postulated that the better the facilitating conditions, the greater the intention to use MB. Therefore, the following hypothesis was formulated:

H4: Facilitating conditions positively influence the behavioral intention to use MB.

Hedonic Motivation

Hedonic motivation was conceptualized by Venkatesh *et al.* (2012) as the fun or pleasure obtained by using a technology. These are intrinsic utilities that, in a consumer environment with the offer of credit via cell phone, can awaken a perception of pleasure in the user (Baabdullah *et al.*, 2019). Aligned with the empirical studies of Baptista and Oliveira (2015), Farah *et al.* (2018) and Marpaung *et al.* (2021), the present study suggested that the greater the hedonic motivation of the microcredit audience, the greater their behavioral intention to use. Given this, the following hypothesis was created:

H5: Hedonic motivation positively

influences the behavioral intention to use MB.

Price Value

Venkatesh *et al.* (2012) conceptualized price value as consumers' cognitive trade off between the benefits perceived from using services and their monetary cost. By using UTAUT, Alalwan *et al.* (2017) found a significant relationship between price value and customers' intention to adopt MB, concluding that Jordanian customers have a particular interest in price value issues in forming their decision to reject MB. Using marketing tools, banks can convince their customers that implementing MB will provide a better quality of life, saving time, cost and effort, which makes the use of technology more valuable in relation to the cost paid, increasing the positive relevance of the price in the customer's view. Cruz, Figueiras Neto and Munoz-Gallego (2010), Singh and Srivastava (2018), Baabdullah, Alalwan, Rana, Kizgin and Patil (2019) and Yu (2012) also found financial costs to be the main barrier or were considered inhibitors of technology adoption. Therefore, the following hypothesis was constructed:

H6: Price value positively influences the behavioral intention to use MB.

Habit

For the authors of UTAUT 2, Venkatesh *et al.* (2012), habit is prior behavior and the extent to which individuals tend to perform behaviors automatically because of learning. Farah *et al.* (2018) found a negative relationship between habit and behavioral intention to use MB in Pakistan, suggesting that consumers may hesitate to use a new technology if it conflicts with their already internalized habits. Chemingui and Ben lallouna (2013) identified tradition as inertia towards changing habits, as the main psychological barrier to the adoption of financial services, customers are used to going to physical branches and may feel uncomfortable using self-service technologies.

Thus, in line with the studies mentioned above and despite there being studies that identified a positive relationship between habit and intention to use (Baabdullah *et al.*, 2019; Baptista & Oliveira, 2015; Venkatesh, Thong, & Xu), the present study suggests that, given



the traditional habits inherent to the public of low-income entrepreneurs that characterize microcredit, with the personal service of the credit agent and the custom of going to the physical bank branch (Hanafizadeh, Behboudi, Koshksaray, & Tabar, 2014), these traditional habits will constitute a barrier to adoption and will contribute negatively to the use of MB (Moorthy *et al.*, 2017). Based on the principle that the microcredit public is not in the habit of using digital channels and self-service, this work postulated the following hypothesis:

H7: Habit negatively influences the behavioral intention to use MB.

Intention and Use Behavior

Intention to use expresses the consumer's discrete probability of using something specific in a certain time, it is the individual's intention to perform a certain behavior. Ajzen (1991) further argues that intentions are used to obtain the motivational factors that instigate behavior.

Yu (2012) points out that considering that the main objective of companies, especially financial institutions, is to make consumers adopt their services, instead of the intention to adopt, academic production has examined the relationship between behavioral intention and the effective use of technologies. UTAUT, as well as the Theory of Planned Behavior, the Theory of Diffusion of Innovations and several other theories and models supported and proved that behavioral intention has a significant influence on the use of technologies (Alalwan *et al.*, 2017). Given this, the following hypothesis was presented:

H8: Intention to use positively influences MB usage behavior.

Moderating Effects of Age, Gender, and Experience

In several studies on the adoption of MB, demographic factors of users are used as important variables that influence the intention and behavior of using MB, according to the 55 articles on the topic reviewed by Shaikh and Karjaluoto (2015). In the seminal article on UTAUT 2, Venkatesh *et al.* (2012) confirmed the importance of the factors age, gender and

experience as moderators of the model constructs. Due to the significance of the moderating effects of demographic factors, the authors suggest that the technology industry should adopt a market segmentation strategy that takes into account social roles at each stage of age, experience and gender (Glavee-Geo, Shaikh, & Karjaluoto, 2017).

Thus, following what the literature on demographic factors indicates, the following hypotheses were presented:

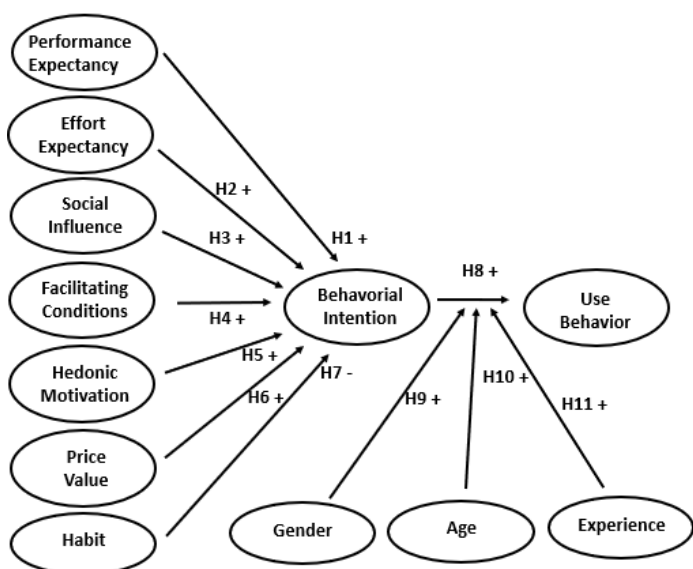
H9: User gender moderates by strengthening the relationship between usage intention and behavior;

H10: User age moderates, strengthening the relationship between intention and usage behavior;

H11: User experience moderates by strengthening the relationship between usage intention and behavior.

Theoretic Model

The proposed model measured the seven constructs of the extended theory as predictors of intention to use, as well as the influence of this intention on the behavior of using MB by the microcredit public. Adapting the seminal theory, the proposed model measured the moderating effect of demographic variables (age, gender and experience) only in the relationship between intention and usage behavior. Furthermore, the model measured the negative effect of the habit construct on intention to use.

**Figure 1***Proposed Theoretical Model.*

Source: Adapted by author based on the UTAUT 2 of Venkatesh, Thong e Xu (2012).

METHODOLOGY

The research is quantitative in nature, descriptive, survey-type, cross-sectional. The research study population was made up of the target audience for microcredit established by law, urban entrepreneurs who develop productive activities with income or annual gross revenue of up to BRL200 thousand.

The sampling method was non-probabilistic due to accessibility. Data were collected in person by the researcher and five other trained interviewers, who used printed questionnaires to interview small urban entrepreneurs, located in fairs and peripheral neighborhoods in the metropolitan region of São Luís, of Imperatriz and Caxias, municipalities in the state of Maranhão, Brazil, from August 1st to 30th, 2019. The choice of face-to-face data collection was due to the possibility that some small entrepreneurs still do not use email or social networks to send questionnaires electronically and that these could be unduly eliminated from the research. And the cities were chosen due to the ease of access to the target audience and because they are populated cities, with a large concentration of small urban entrepreneurs.

In order to confirm users' understanding of the questionnaire, we carried out a pre-test with eight small entrepreneurs, the target

audience for microcredit, as a way of identifying gaps in understanding and language in the questionnaire. After the pre-test, the Likert scale was changed to 5 points and some terms were adapted to facilitate understanding.

The first and second questions of the questionnaire are intended to ensure that the respondent belonged to the research interest group. The third and fourth questions identified whether respondents had a smartphone with internet access; and the fifth question was to identify the entrepreneur as a customer, or not, of a financial institution.

Next, questions 6 to 34 are taken from the UTAUT 2 model from the work by Baptista and Oliveira (2015) and Alalwan *et al.* (2017) and adapted to the MB context. Questions 6 to 30 measured the constructs performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit, constructs which antecedent intention to use. The latent variable intention to use UTAUT 2 was assessed by questions 31 to 33. Question 34 was to characterize the usage behavior construct and asked about the frequency of use of the services most demanded by MB users, these services are highlighted by the Brazilian Federation of Banks (2018) as the most used by Brazilians. The last part referred to sociodemographic issues and the user's experience with MB.

Regarding the sample, 554 questionnaires were obtained, with 50 respondents reporting that they did not have their own productive activity and/or that they had an income greater than BRL200 thousand (not being included in the microcredit audience) and 34 respondents did not complete the survey, leaving questions to be completed, leaving a final sample of 470 valid questionnaires. The sample size taken is greater than the minimum sample of 103 respondents calculated by the G*Power 3.1.9.4 software (Ringle, Silva, & Bido, 2014).

In the sample, the predominance of females can be seen, with 58% of the sample, which is characteristic of microcredit (Caçador, 2014; Yunus & Jolis, 2000) and aged between 26 and 35 years. Regarding education, only 17% have completed higher education or postgraduate studies, with the majority (40%) having completed secondary education, which may be linked to



the low income of up to BRL2,000.00 of 45% of respondents.

And for data analysis, the structural equation modeling technique was used for hypothesis testing and confirmatory factor analysis, to evaluate the convergent validity and precision of the measurement model (Ringle, Silva, & Bido, 2014).

RESULTS

Measurement and Structural Models

Initially, to evaluate the accuracy of the measurement model, we performed the confirmatory factor analysis (CFA), testing the convergent and discriminant validity of the proposed model. Although all the values of the average variance extracted were above 0.6, suggesting adequate convergence of the indicators to the construct, the factor loadings of the variables CF4, HT2 and US4 presented values below 0.5 (Hair, Black, Babin, Anderson, & Tatham, 2009). Variables CF4 and HT2 were eliminated from the model, however, variable US4, which deals with MB usage behavior, was maintained, despite the low factor loading, because it is a question that assesses the frequency of credit use by MB and is important for the discussion of results. This result may have been obtained due to the characteristics of the study population, in which 83.0% of respondents stated that they had never taken out credit through MB and 10.6% had rarely taken out credit, a high percentage of the entire sample.

After the exclusions, we ran a new CFA and observed, through the Cross Loadings, that all indicators were above 0.5 (with the exception of US4) and that the highest factor loadings were linked to their respective latent variables (values highlighted in cells and in bold font). Furthermore, even the variable US4, which has a factor loading of 0.35 in relation to its construct, this is the highest value of the line that represents its relationship with the other constructs in the model. Therefore, we found that the constructs are really different from the others and the model has discriminant validity according to the criterion by Chin (1998).

Another criterion of discriminant validity is that by Fornell and Larcker (1981) and all square roots of the average variances extracted (AVE) of

each construct are greater than the correlations between the other constructs, with values above 0.78, again attesting to the independence of the latent variables from each other. All correlations were significant at 1%.

Regarding convergent validity, the AVEs, which are the mean quadratic factor loadings of each construct, were above 0.6, signaling adequate convergence and above the minimum of 0.5 indicated by Hair *et al.* (2009) and Ringle, Silva and Bido (2014). Composite reliability (CR) and Cronbach's alpha (CA) are also convergence indicators and, according to Hair *et al.* (2009), values above 0.7 suggest a good value of internal consistency and reliable responses. All CR and CA values presented were considered satisfactory.

Once the validity of the measurement model was attested, the theoretical or structural model was evaluated, in which the focus leaves the relationship between constructs and measured variables and goes to the nature and magnitude of the relationships between the constructs, forming a diagram of paths to be validated. To carry out the hypothesis test, the complete bootstrapping command was run in the Smart PLS 3.2.8 statistical software, with 5,000 subsamples, the results of which are presented in Table 1.

Table 1
Hypothesis Testing

Structural Relations	Hypothesis	VIF	f ²	Structural Coefficient	Standard Error	Valor t	p-valor	R ²
Performance Expectancy -> Intention	H1+	2.622	0.015	0.108	0.062	1.747	0.081	0.702
Effort Expectancy -> Intention	H2+	3.484	0.002	0.039	0.065	0.612	0.541	
Social Influence -> Intention	H3+	1.554	0.029	0.116	0.039	2.996	0.003	
Facilitating Conditions -> Intention	H4+	2.653	0.041	0.181	0.058	3.111	0.002	
Hedonic Motivation -> Intention	H5+	1.836	0.003	-0.042	0.037	1.132	0.258	
Price Value -> Intention	H6+	2.316	0.003	0.043	0.043	1.006	0.315	
Habit -> Intention	H7 -	3.141	0.271	0.504	0.064	7.853	0.000	0.569
Intention -> Use Behavior	H8+	1.222	0.248	0.361	0.031	11.570	0.000	
Moderation effect Gender -> Use Behavior	H9+	1.013	0.000	-0.009	0.023	0.368	0.713	
Moderation effect Age -> Use Behavior	H10+	1.137	0.000	0.012	0.029	0.432	0.666	
Moderation effect Experience -> Use Behavior	H11+	1.176	0.008	0.069	0.035	1.965	0.045	

Caption: VIF – variance inflation factor, f² - Cohen effect (1988), R² - coefficient of determination.

Source: Research data.

DISCUSSION

The analysis of the correlation between the model's constructs is important to evaluate



multicollinearity problems that may affect the model's predictive power. The variance inflation factor (VIF) expresses how much the variable is not explained by the others and can signal biases, if the constructs are highly correlated. Values below 5.00 are desired and signal the uniqueness of the construct. The VIF values of the present model varied between 1.01 and 3.48, therefore behaving within the tolerance level for multicollinearity (Hair *et al.*, 2009).

Based on Cohen's criteria (1988), for social and behavioral sciences, R^2 above 0.26 is considered to have a great effect. The model proposed by the present study presented the values of $R^2 = 0.70$ for the intention to use construct and $R^2 = 0.56$ for the usage behavior construct. This means that the variables performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit explain, by up to 70%, the intention to use MB by the microcredit public and that the intention to use explains, by up to 56%, the behavior of using MB by the microcredit public.

Starting the hypothesis test, the first hypothesis H1 proposed that performance expectancies positively influence the intention to use MB. According to the results of H1 presented in Table 1 ($f^2 = 0.015$, $\Gamma = 0.108$ and p -value > 0.05) the hypothesis was rejected, as it showed no significance and small effect size f^2 . Performance expectancy is the extent to which a user believes that using MB will provide benefits in performing financial services. Although UTAUT 2 had a significant effect, for the microcredit audience, performance expectancies did not influence their intention to use MB. This result is in line with the research by Yaseen and El Qirem (2018), which also found no significance in the relationship between performance expectancies and intention to use e-banking in Jordan.

Regarding effort expectancy, hypothesis H2 proposed that it positively influences the intention to use MB. This hypothesis was also not supported ($f^2 = 0.002$, $\Gamma = 0.039$ and p -value > 0.05), demonstrating no significance and small effect size f^2 . A similar result was also obtained by Baptista and Oliveira (2015), who did not confirm the significance of performance expectancy in the intention to use MB in a model that evaluated UTAUT moderated with cultural

factors. Therefore, there is no evidence that the degree of ease influences the intention to use MB by the microcredit public.

In hypothesis H3, which positively related social influence to intention to use, it was found that this was not rejected ($f^2 = 0.029$, $\Gamma = 0.186$ and p -value < 0.01), corroborating the research results by Makanyeza (2017), Bhatiasevi (2016), Martins, Oliveira and Popovic (2013) and Alalwan *et al.* (2017). These studies stated that incentives from people around customers can contribute to intention to use technology.

Thus, the results found indicate that the influence of people who are close to small entrepreneurs, the microcredit audience, of people who can influence their behavior, or who are important to them, are able to influence their intention to use the MB. This fact reinforces the role of the microcredit agent and group learning on the use of new technologies or MB features for this specific audience.

The fourth hypothesis (H4) investigated sought to identify whether facilitating conditions positively influence the intention to use MB. The hypothesis was supported by the model ($f^2 = 0.041$, $\Gamma = 0.181$ and p -value < 0.01), in line with studies by Alalwan *et al.* (2017), Baabdulah *et al.* (2019) and Venkatesh *et al.* (2012). For Alalwan *et al.* (2017), customers would be more motivated to use MB if they had more access to support services from companies.

Thus, there is evidence that the facilitating conditions provided by financial institutions that develop microcredit influence, in a positive way, the intention of these customers to use the services through MB. By facilitating conditions we mean a whole range of support and training services, such as call centers, in-app chats, video tutorials and face-to-face guidance from the microcredit agent.

Continuing with the discussion of the results, now checking the intrinsic characteristics, hypothesis H5 was rejected, as it presented a low structural coefficient and was not significant ($f^2 = 0.003$, $\Gamma = -0.042$ and p -value > 0.05). Despite the UTAUT 2 theory, by Venkatesh *et al.* (2012), studies by Alalwan *et al.* (2017), Baabdulah *et al.* (2019), Baptista and Oliveira (2015) and Farah *et al.* (2018) having found hedonic motivation as a predictor of intention, in the present study, this latent variable was not sufficient to influence the



intention to use MB by the microcredit public.

Regarding consumers' cognitive trade-off between the perceived benefit and the monetary cost of services provided by MB, hypothesis H6 postulated that price value positively influences the public's intention to use microcredit. This hypothesis was rejected as it was not significant at 5% and due to the low structural coefficient and effect size ($f^2 = 0.003$, $\Gamma = 0.043$ and $p\text{-value} > 0.05$). A similar result was also found by Baptista and Oliveira (2015), since price also did not influence the behavioral intention to use MB in Mozambique. The argument found by the authors on the African continent could perhaps also be the reason for the non-significance of the construct here in Brazil, because Mozambicans perceived MB services as free of fees and with lower costs than other means or service channels.

Continuing with the discussion of the results, hypothesis H7 suggested that habit negatively influences the intention to use MB for the microcredit audience. The UTAUT theories (Venkatesh *et al.*, 2003) and UTAUT 2 (Venkatesh *et al.*, 2012) found a positive relationship between habit and intention to use, however studies by Farah *et al.* (2018) and Chemingui and Ben lallouna (2013) found a negative effect on habit and tradition, while inertia to change habits, in relation to the behavioral intention of use.

The results found in the present study reveal a high level of significance in the relationship between habit and intention to use with a $p\text{-value}$ of 0.000, the f^2 effect is considered medium (0.27) and the path coefficient proved to be the strongest in the model with $\Gamma = 0.504$, but with a positive effect, making hypothesis H7 not supported. Therefore, traditional habits that would be obstacles and influence negatively were not confirmed. The habit construct was validated as the greatest predictor of intention to use the model and in a positive way, leading us to believe that previous experiences and the frequency of past behavior can contribute to the intention to use technologies, regardless of the characteristics peculiar to the microcredit audience. In this sense, the findings here corroborate previous studies by Venkatesh *et al.* (2012), Baabdulah *et al.* (2019) and Baptista and Oliveira (2015).

After analysis and discussion of the exogenous constructs antecedent to intention, the result found for H8 ($f^2 = 0.248$, $\Gamma = 0.361$ and

$p\text{-value} < 0.01$) supported the hypothesis and is in line with the findings by Yu (2012), Alalwan *et al.* (2017), Ajzen (1991) and Makanyeza (2017). In this way, the MB usage behavior by the microcredit public can be predicted up to 0.36 by the intention to adopt the technology.

The H9 hypotheses ($f^2 = 0.000$, $\Gamma = -0.009$ and $p\text{-value} > 0.05$) and H10 ($f^2 = 0.000$, $\Gamma = 0.012$ and $p\text{-value} > 0.05$), that suggested a positive moderating effect of gender and age on usage behavior were not supported, as they were not significant and the size of the f^2 effect was non-existent. Therefore, unlike the findings by Koksál (2016), Choudrie, Junior, McKenna, and Richter (2018), Berraies, Ben Yahia and Hannachi (2017) and Haider, Changchun, Akram and Hussain (2018), there was no change in the relationship between intention and usage behavior for the microcredit audience, regardless of gender and age.

In hypothesis H11, which proposed moderation of the experience, strengthening the relationship between intention and usage behavior, the hypothesis was supported with a significance level of 5% and a positive path coefficient ($f^2 = 0.008$, $\Gamma = 0.069$ and $p\text{-value} < 0.05$). When it comes to moderating effect, Hair, Sarstedt, Hopkins and Kuppelwieser (2014) suggest the following classification for effect size f^2 : 0.005 = small; 0.010 = medium and 0.025 = large effect. Therefore, there is a moderating effect of experience on the relationship and the value of f^2 was between small and medium effect. Therefore, we believe that the microcredit public that has been using services through apps for longer is more likely to evolve from the intention to the behavior of using MB, making the relationship between intention and usage behavior stronger, corroborating the study by Karjaluo, Matilla and Pentto (2002).

Both habit, as a positive predictor of intention to use, and experience, as a moderating variable of the relationship between intention and use of financial applications, were significant in the model, this fact also deserves attention from financial services institutions that may be encouraging the use of MB apps through rewards for the use of financial and non-financial services, developing new products more suited to this audience, promotions through messages within the app and other actions that encourage

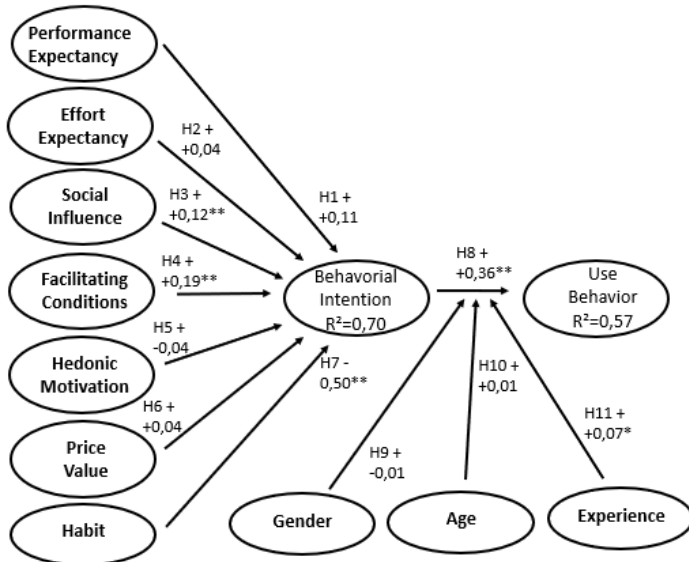


the microcredit public to have the experience of using the app.

and between clients/solidarity groups, as a way of encouraging constant use of the application, not only for financial services, but for creating relationship networks within MB that encourage constant user experience.

Figure 2

Path Diagram.



Caption: R²- Determination coefficient, **p<0.01 significance at 1%, * p<0.05 significance at 5%.

Source: Research data.

CONCLUSION

The results of this study showed that intention to use is a strong predictor of MB usage behavior by the urban microcredit public and this relationship can be moderated by user experience, that is, the more experience the small urban entrepreneur has, the more likely they will be to incorporate MB usage behavior. The variables gender and age, acting alone, were not moderators of the relationship between intention and behavior of use. Therefore, the general objective of the present study – to measure the influence of the antecedent variables of UTAUT 2 – in the intention and behavior of using MB by the microcredit public was achieved.

The findings of the present study also showed that in order to have effective MB usage behavior on the part of this public, financial institutions must invest in support actions and guidance for using the application, encourage guidance in solidarity groups, which are characteristic of microcredit, in order to encourage social influence and make MB a communication tool between client and company

As a practical contribution, in a scenario where a large number of small, low-income entrepreneurs have difficulty accessing productive credit, responsible for generating employment and income, understanding the factors that influence the intention and behavior of using MB by the urban microcredit public is of fundamental importance to act in resolving obstacles and generating stimuli. Contributing, therefore, both to financial institutions, in terms of improving productivity and efficiency with MB, and to facilitate access to microcredit, which generates jobs, income and economic and social development, as well as for the development of new services in the future, more suited to the sensitive characteristics of this public, highlighted in this study.

In the field of theoretical contribution, it was found that the Unified Theory of Acceptance and Use of Technology, UTAUT 2, by Venkatesh *et al.* (2012), was not fully validated in relation to the urban microcredit audience. Four latent variables and two moderating factors were not significant in the model, which demonstrates the peculiarity of this audience. This research innovated by studying the behavior of using technological tools among a target audience that is difficult to reach, low-income entrepreneurs, hence the need to collect data in person and not using traditional technological survey research tools.

Regarding research limitations, the sample obtained may be a limitation, as it was restricted to three cities in the state of Maranhão, which may have peculiar cultural characteristics, influencing the responses in the questionnaire. The form of data collection, in person, can also have an influence on the responses, as well as the selection of entrepreneurs at fairs and markets based on accessibility and not based on statistical criteria.

Future research can be carried out with a more representative sample of the five Brazilian regions, in addition to the possibility of inserting new constructs, such as Perceived Risk or Trust in the UTAUT 2 model, that may inhibit the use of technologies. Finally, the rural microcredit



audience is also an interesting study population that may have different results, due to cultural issues.

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