

Exploring factors and the role of environmental responsibility in m-banking adoption: a systematic review

Hicham BAHIDA¹, Rachid ZIKY², Fatima CHAREF¹, Brahim BOUZAHIR³, Ahmed ABRIANE², Lamia BOUKAYA⁴

¹ LSEPP, FEJK, Kénitra, Morocco

² LAREFMO, FSJES, Agadir, Morocco

³ LP-MO, ENCG, El jadida, Morocco

⁴ ENCGA, University Ibn Zohr, Agadir, Morocco

Abstract. Due to the digital revolution and the Covid-19 pandemic, banking institutions are compelled to adapt by incorporating innovative technologies for their digital transformation. In this review, we have synthesized available studies addressing the impact of environmental responsibility on the behavior of banking customers in the adoption of m-banking. To accomplish this, a systematic review was conducted following the four-step PRISMA process to identify references published in the last decade. Investigations were carried out in the Scopus and Science Direct databases. Insights into mobile banking adoption were obtained through bibliometric analysis using NVivo10. TAM and UTAUT are widely recognized as two robust frameworks for predicting the acceptance of technological innovations. Several variables such as ease of use, perceived usefulness, facilitating conditions, trust, etc., are important in predicting the usage of m-banking applications. In the context of future research, it is advisable to consider mixed methods for a better understanding of user behavior. The inclusion of unpublished studies and expanding research scope to developing countries like Morocco are also crucial for capturing the challenges specific to these contexts.

Keywords: bibliometric analysis, M-banking, PRISMA, environmental responsibility, systematic review, TAM, UTAUT.

1. Introduction

In the current situation characterized by the digital revolution and Covid-19, banking customers are becoming increasingly demanding. They have access to various services on an international and national scale through digital technologies. In this regard, banks have accelerated their digital banking services worldwide, especially in an environment marked by the growth of mobile internet [1]. Indeed, banking institutions are compelled to meet the demands of their customers. Therefore, they offer a diverse range of services for the benefit of their clients, using new digital technologies such as mobile banking application. This tool remains the primary means, among others, used by customers to conduct their transactions using digital tools such as phones, smartphones [2]. Mobile banking is a form of digital banking [3] that also enables customers to access multiple services such as opening bank

accounts, executing transfers, paying bills, as well as requesting bank statements, checkbooks, ATM cards, and filing complaints [4].

Furthermore, m-banking (mobile banking application) presents several economic and environmental advantages. From an economic perspective, this technological innovation allows users to reduce travel expenses, save time, etc. From an environmental standpoint, there are several ways in which this application can contribute to the environmental protection. On the one hand, it helps reduce paper usage. Similarly, banks can encourage users to digitize checks and deposits instead of using envelopes and stamps to mail checks through the mobile banking application. On the other hand, these mobile banking services enable clients to conduct online banking operations, thereby eliminating the need to visit a bank branch in person. This reduces the need to travel by car, which can reduce carbon footprint.

The primary goal of this research is to summarize existing research on the factors that explain why banking customers adopt mobile banking services, with a focus on environmental factors. Specifically, the study seeks to identify the most important theories that address the use of m-banking application by banking users. Furthermore, it aims to define the key variables that explain the usage of this innovation. Lastly, the study examines the most commonly used research methods by researchers in this context. To achieve our research objectives, we applied the PRISMA method. Our research process consisted of five clear steps. Firstly, we conducted a search for keywords in Scopus and Science Direct to identify the most relevant bibliographic references. Secondly, we used the bibliographic management software Mendeley to sort the selected references. We applied specific selection criteria, such as the reference should be written in English, the empirical nature of the studies, their publication in indexed journals, etc. Then, we thoroughly reviewed the literature. Finally, we communicated and interpreted the results of our study.

Our systematic review aims to address existing gaps by identifying relevant studies, evaluating their methodological quality, synthesizing the results, and identifying areas requiring further research. In this regard, our study focuses on the central question: to what extent does environmental responsibility influence the acceptance of m-banking by banking users? This problem is divided into the following sub-questions:

- What are the primary theoretical frameworks employed in prior research?
- What is the most commonly adopted methodology in previous studies?
- Which variables have had the greatest impact in previous studies?

This research contributes in several ways. Firstly, it adds to previous research by showing how environmental responsibility influences customers' intention to use the m-banking. Additionally, this study can be highly valuable for banks, decision-makers, and researchers as it enhances our understanding of the main factors that influence customers' adoption of this technological innovation in the sector of banking. Thirdly, the results of this research would enable banks to better tailor products and marketing strategies to the needs of banking customers. Lastly, this study could help us identify gaps in current research concerning the factors that explain the usage of digital banking.

2. Article Maps

Our systematic review will be structured into several sections. Firstly, we will begin with a general introduction, followed by an exposition of the methodological approach used in this

study. Next, we will provide a detailed overview of the obtained results. This will pave the way for discussion and suggestions. Lastly, we will conclude the article with a general conclusion.

3. Methodology

The first step involves identifying bibliographic references in two databases, Scopus and ScienceDirect, using the following keywords: M-banking, Mobile bank adoption, intention to use, use of mobile banking. We chose Scopus and ScienceDirect due to their strong reputation for including high-quality references. These two databases facilitate the identification of articles based on multiple criteria used to select the studies (see Table 1). We opted for a study period of 10 years, covering the period from 2013 to 2022, to examine relevant literature. This selection enabled us to obtain a comprehensive and in-depth understanding of the subject under study. By covering this extended period, we could qualitatively analyze published research works over a decade. Taking into account this broad temporal perspective, our systematic review will be able to provide a clear and comprehensive analysis of the state of knowledge during this specific period. This phase allowed us to identify 41 references in Scopus and 615 references in ScienceDirect.

Table 1. Selection criteria of references

Levels	Inclusion criteria	Exclusion criteria
Article type	Research Articles	Conference Papers, Book Chapters, and Other Sources
Language of publication	English	Other languages
Selected period	2013- Until May2023	Articles published outside the selected period
Research method	Qualitative, quantitative, mixed	Absence of an empirical study.
Consulted database	Scopus and ScienceDirect databases.	Other databases
Keywords selected	M-banking, mobile Bank adoption, , intention to use, use of mobile banking.	Other keywords
Research areas	Business, Management, and Accounting	Other fields

The second step involves eliminating duplicate references in both databases. Furthermore, during this phase, we employed specific criteria to include or exclude references in our review. We made sure to select references based on their title and abstract, ensuring their relevance to our study. The third step involves reading the full text. The objective is to assess the suitability of the selected references in relation to our research problem and inclusion criteria. The final step consists of analyzing the selected articles. There are several methods for analyzing references, such as meta-analysis, narrative analysis, bibliometric analysis, etc. In our current article, we adopted bibliometric analysis to identify frequent theories, limitations, variables with the greatest impact, the number of citations, the publication trends by year, and the most influential authors in this field. We summarize our research approach in the figure below.

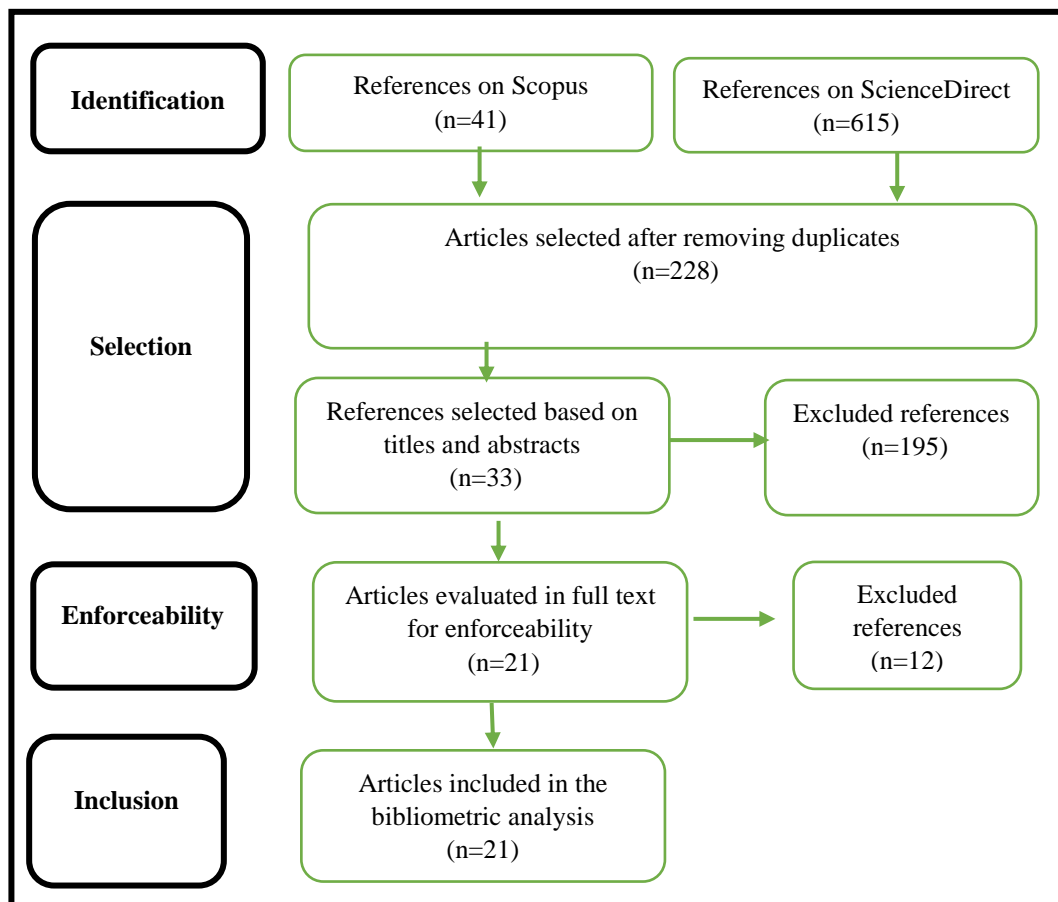


Fig1. PRISMA Diagram

4. Results and Discussions

We will conduct a bibliometric analysis to examine the general characteristics of the articles included in the study. This analysis will focus on aspects such as publication years, author frequency, and publishing journals, among others.

4.1. Citations by Author

We will proceed with a bibliometric analysis of the main characteristics. To gain insight into the authors who have the most influence in our study, the statistics regarding the number of citations per author are summarized in the graph below.

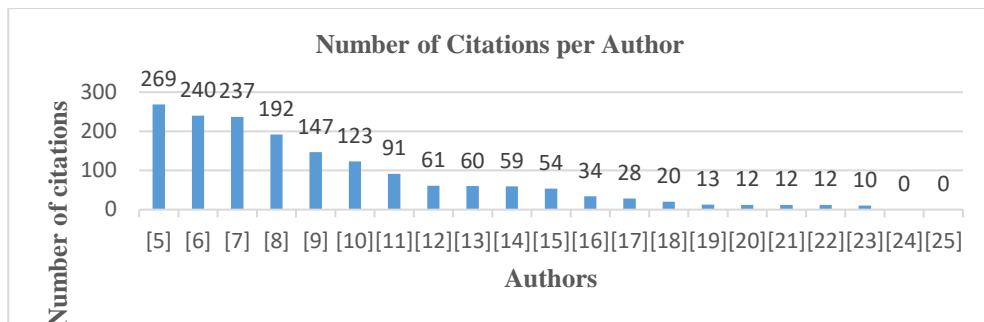


Fig2. Number of Citations per Author

The above table indicates that the most influential author in the field of study is [26], with a significant number of citations, totaling 269 citations. Additionally, other authors have also received over 200 citations, such as [6] with 240 citations and [12] with 237 citations.

4.2. Analysis of the main theories used

In this section, we will focus on the key theories adopted by the authors to study how environmental responsibility influences the acceptance and usage of m-banking. The table below summarizes the main theories utilized in previous empirical studies.

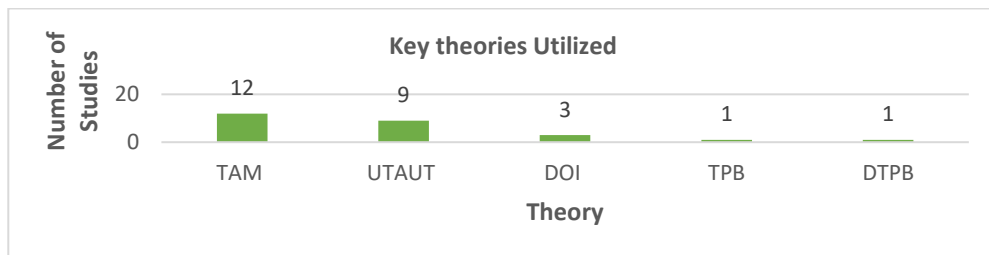


Fig3. The distribution of the sample by publication journal is as follows

The selected references cover various models and theories explaining the usage of m-banking. Among the identified models, the following models are included: TAM, UTAUT, DOI, TPB, and DTPB. According to the table below, TAM and UTAUT are the most commonly used theories in our context. UTAUT is considered the best model compared to others. This is supported by the results of their models, which can explain over 70% of the variance (adjusted R2) in the adoption of technological innovation, while other models have lower determination coefficients. Furthermore, TAM is widely recognized as a robust and effective model. Firstly, this model is easy and simple to understand. Moreover, it can be adapted and applied to different domains and technologies.

4.3. Analysis of Research Methods Adopted by Empirical Studies

Using NVivo10 software, we examined the research methodology employed in all of our references. The results suggest that the majority of selected studies (19 articles) has adopted a quantitative approach, representing 90.48% of the sample. Only two studies used a qualitative or mixed approach, accounting for 4.76% of the sample. The table below provides an overview of the nature of the empirical studies.

Table 2. Nature of Empirical Studies

Method	Number of articles	Frequency (%)
Quantitative	19	90,48
Qualitative	1	4,76
Mixed	1	4,76

4.4. The key variables selected in previous empirical studies

We will examine the key variables identified in the current literature review in order to include them in the construction of our conceptual model to be tested in the Moroccan context. By analyzing previous studies, we have grouped the most frequently mentioned variables, which are summarized in the table below.

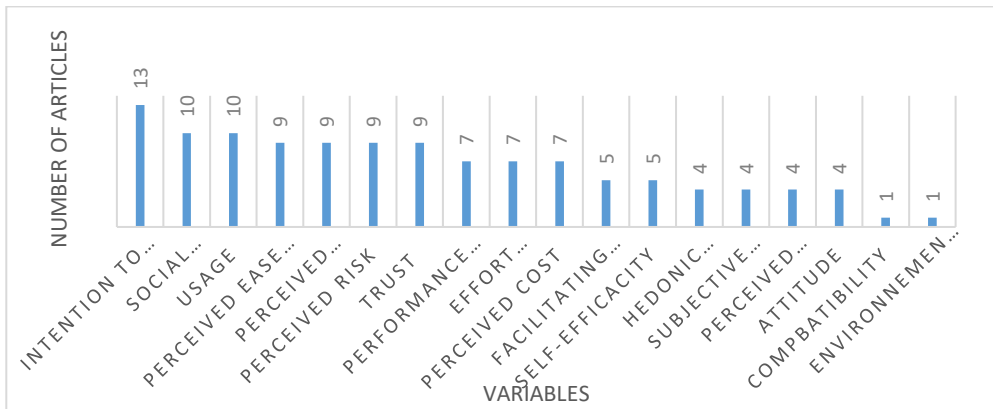


Fig4. The key variables selected in empirical studies

According to the results of our in-depth analysis using Nvivo10 software, we found that certain variables were particularly significant in predicting the use of m-banking applications. Among these variables, we identified social influence, ease of use, usefulness, perceived risk and trust, performance expectancy, effort expectancy and perceived cost, facilitating conditions, as well as self-efficacy. However, our research also focuses on the impact of environmental responsibility on the acceptance of m-banking by users. In this regard, we observed that this variable had a less significant impact. The table below summarizes the main variables identified in the selected studies.

5. Conclusion

This systematic review examined and analyzed existing studies that explore the factors influencing the acceptance and usage of m-banking among banking users, with a particular focus on environmental factors. Our objective was to determine the most relevant theories, identify key factors, and examine the research methodology adopted by researchers in this field. Finally, we also addressed the limitations of these studies.

Based on our results, TAM and UTAUT are widely considered as robust and effective models for predicting m-banking usage. Additionally, we observed that certain variables were particularly important in predicting m-banking usage. Among these variables, we

identified performance expectancy, social influence, ease of use, usefulness, perceived risk, perceived cost, facilitating conditions, and self-efficacy. However, our research also focused on the impact of environmental responsibility on m-banking acceptance. We found that this variable had a less significant impact.

Overall, the results suggest that most studies used a quantitative research methodology. Although this systematic review has its advantages, it is important to note some limitations, such as the exclusion of studies with significant findings, heterogeneity of the selected research, and the lack of studies in developing countries such as Morocco.

The limitations identified in this systematic review are crucial for future research. First and foremost, future research could greatly benefit from incorporating qualitative and mixed methods to enhance the comprehension of the topic. Furthermore, incorporating unpublished studies, such as theses and ongoing research, could also be considered in future investigations.

References

- [1] G. M. Y. Owusu, R. A. Bekoe, A. A. Addo-Yobo, and J. Otioku, "Mobile Banking Adoption among the Ghanaian Youth," *J. African Bus.*, vol. 22, no. 3, pp. 339–360 (2021).
- [2] K. Owusu Kwateng, K. A. Osei Atiemo, and C. Appiah, "Acceptance and use of mobile banking: an application of UTAUT2," *J. Enterp. Inf. Manag.*, vol. 32, no. 1, pp. 118–151 (2019)
- [3] A. A. Shaikh, R. Glavee-Geo, and H. Karjaluo, "How relevant are risk perceptions, effort, and performance expectancy in mobile banking adoption?," *Int. J. E-bus. Res.*, vol. 14, no. 2, pp. 39–60 (2018)
- [4] K. Tamilmani, N. P. Rana, S. F. Wamba, and R. Dwivedi, "The extended Unified Theory of Acceptance and Use of Technology (UTAUT2): A systematic literature review and theory evaluation," *Int. J. Inf. Manage.*, vol. 57 (2021)
- [5] S. K. Sharma and M. Sharma, "Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation," *Int. J. Inf. Manage.*, vol. 44, no. September 2018, pp. 65–75,(2019)
- [6] F. Muñoz-Leiva, S. Climent-Climent, and F. Liébana-Cabanillas, "Determinantes de la intención de uso de las aplicaciones de banca para móviles: una extensión del modelo TAM clásico," *Spanish J. Mark. - ESIC*, vol. 21, no. 1, pp. 25–38 (2017)
- [7] A. M. Baabdullah, N. P. Rana, A. A. Alalwan, R. Islam, P. Patil, and Y. K. Dwivedi, "Consumer Adoption of Self-Service Technologies in the Context of the Jordanian Banking Industry: Examining the Moderating Role of Channel Types," *Inf. Syst. Manag.*, vol. 36, no. 4, pp. 286–305(2019)
- [8] M. Merhi, K. Hone, and A. Tarhini, "A cross-cultural study of the intention to use mobile banking between Lebanese and British consumers: Extending UTAUT2 with security, privacy and trust," *Technol. Soc.*, vol. 59, no. July, p. 101151 (2019)
- [9] W. Chaouali, I. Ben Yahia, and N. Souiden, "The interplay of counter-conformity motivation, social influence, and trust in customers' intention to adopt Internet banking services: The case of an emerging country," *J. Retail. Consum. Serv.*, vol. 28, pp. 209–218 (2016)
- [10] M. F. Farah, M. J. S. Hasni, and A. K. Abbas, "Mobile-banking adoption: empirical evidence from the banking sector in Pakistan," *Int. J. Bank Mark.*, vol. 36, no. 7, pp. 1386–1413 (2018)
- [11] H. K. Richard Glavee-Geo, Aijaz Ahmed Shaikh, "Mobile banking services

- adoption in Pakistan: are there gender differences?," *Int. J. Bank Mark.*, vol. 35, no. 7, pp. 1090–1114 (2017)
- [12] A. M. Baabdullah, A. A. Alalwan, N. P. Rana, P. Patil, and Y. K. Dwivedi, "An integrated model for m-banking adoption in Saudi Arabia," *Int. J. Bank Mark.*, vol. 37, no. 2, pp. 452–478 (2019)
- [13] A. Shankar, "Factors affecting mobile banking adoption behavior in India," *J. Internet Bank. Commer.*, vol. 21, no. 1 (2016)
- [14] J. C. Ho, C. G. Wu, C. S. Lee, and T. T. T. Pham, "Factors affecting the behavioral intention to adopt mobile banking: An international comparison," *Technol. Soc.*, vol. 63, no. August, p. 101360 (2020)
- [15] Y. Jadil, N. P. Rana, and Y. K. Dwivedi, "A meta-analysis of the UTAUT model in the mobile banking literature: The moderating role of sample size and culture," *J. Bus. Res.*, vol. 132, pp. 354–372 (2021)
- [16] R. F. Malaquias and A. F. Silva, "Understanding the use of mobile banking in rural areas of Brazil," *Technol. Soc.*, vol. 62, no. April, p. 101260 (2020)
- [17] M. Jamal Haider, G. Changchun, T. Akram, and S. T. Hussain, "Does gender differences play any role in intention to adopt Islamic mobile banking? An empirical study Abstract," *J. Islam. Mark.* (2016)
- [18] W. N. Picoto and I. Pinto, "Cultural impact on mobile banking use – A multi-method approach," *J. Bus. Res.*, vol. 124, no. June 2020, pp. 620–628 (2021)
- [19] N. A. Windasari, N. Kusumawati, N. Larasati, and R. P. Amelia, "Digital-only banking experience: Insights from gen Y and gen Z," *J. Innov. Knowl.*, vol. 7, no. 2, p. 100170 (2022)
- [20] A. Van NGUYEN and T. P. T. NGUYEN, "An Integrated Model of CSR Perception and TAM on Intention to Adopt Mobile Banking," *J. Asian Financ. Econ. Bus.*, vol. 7, no. 12, pp. 1073–1087 (2020)
- [21] D. Chawla and H. Joshi, "Scale Development and Validation for Measuring the Adoption of Mobile Banking Services," *Glob. Bus. Rev.*, vol. 20, no. 2, pp. 434–457 (2019)
- [22] W. Puriwat and S. Tripopsakul, "Mobile banking adoption in Thailand: An integration of technology acceptance model and mobile service quality," *Eur. Res. Stud. J.*, vol. 20, no. 4, pp. 200–210 (2017)
- [23] M. Saparudin, A. Rahayu, R. Hurriyati, and M. A. Sultan, "Exploring the role of trust in mobile-banking use by Indonesian customer using unified theory of acceptance and usage technology," *Int. J. Financ. Res.*, vol. 11, no. 2, pp. 51–60 (2020)
- [24] H. Sudarsono, M. N. Kholid, A. Trisanty, J. S. A. Shidiqie, and P. Suseno, "Examining the adoption of mobile banking: Empirical evidence from Indonesian Muslim students," *Banks Bank Syst.*, vol. 17, no. 2, pp. 138–149, (2022)
- [25] M. J. Haider, G. Changchun, T. Akram, and S. T. Hussain, "Exploring Gender Effects in Intention to Islamic Mobile Banking Adoption: an empirical study," *Arab Econ. Bus. J.*, vol. 13, no. 1, pp. 25–38 (2018)
- [26] S. K. Sharma and M. Sharma, "Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation," *Int. J. Inf. Manage.*, vol. 44, no. July (2018)