





# “Understanding mobile banking adoption via the technology acceptance model: evidence from Jordan”

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# UNDERSTANDING MOBILE BANKING ADOPTION VIA THE TECHNOLOGY ACCEPTANCE MODEL: EVIDENCE FROM JORDAN

**Abstract**

This paper studies the use of mobile banking in Jordan and the factors affecting its adoption through the Technology Acceptance Model (TAM). It examines user behavior across new banking technologies and resistance to adoption, focusing on factors such as perceived ease of use, usefulness, cost, social influence, and trust. The study employed convenience sampling because of privacy restrictions and the lack of a reliable customer database. 498 individuals completed a structured questionnaire, and 437 of them provided valid answers (87.8%). Using a 5-point Likert scale, the questionnaire evaluated demographic information and opinions about the adoption of mobile banking. The responses were analyzed using SmartPLS software. The results reveal that perceived usefulness is a key predictor of the willingness of the Jordanian population to adopt mobile banking. Perceived risk also positively impacts mobile banking usage, while perceived ease of use presents a moderate but significant barrier to adoption. Perceived ease of use also has a significant influence on perceived usefulness, which mediates its effect on adoption. While social influence plays an important role in adopting mobile banking services, trust does not directly affect the intention to use these services.

**Keywords**

technology acceptance model, mobile banking adoption, SmartPLS, Jordan

**JEL Classification**

M21, G21

**INTRODUCTION**

In the last twenty years, there has been an explosion in information technology, communication, and mobile phone usage. The smartphone transformation is a defining feature of our contemporary lives. In 2022, the global number of internet users has reached 4.95 billion, marking a 19 percent increase (929 million) since January 2018. Internet penetration currently represents 62.5 percent of the global population (Kemp, 2022). In 2015, 52.7% of mobile phone users worldwide accessed the internet via their devices. In Jordan, the number of smartphone users has grown, and by early 2022, internet penetration had reached 66.8 percent of the population. KEPIs (Key Environmental Performance Indicators) analysis indicates that the number of internet users in Jordan increased by 33,000, or 0.5 percent, from 2021 to 2022 (Kemp, 2022). GSMA Intelligence reports that mobile connections in Jordan accounted for 78.1 percent of the total population as of January 2022. Furthermore, the data indicate that at the start of 2022, Jordan had 8.03 million cellular mobile connections and 6.87 million internet users (Kemp, 2022). In Jordan, as in many other countries, banks are facing challenges with mobile banking services adoption among customers. This is largely due to difficulties in using mobile banking, social influence, trust issues, and perceived risks associated with mobile banking (Bidar, 2018).

On the one hand, there is still a gap in testing the overall impact of mobile phone banking compared to traditional banking transactions (Al-Azzam, 2017). This is demonstrated by research highlighting unresolved issues in mobile phone banking and a lack of investigation into how this technology impacts banking transactions. Additionally, the effects of recent advancements on mobile banking adoption have not been assessed (Hassan & Wood, 2020). This study will help develop strategies for mobile banking adoption in Jordan and evaluate its impact on society, an area that has not yet been thoroughly explored.

## 1. LITERATURE REVIEW

Over the past few decades, dramatic acceleration in technology and rapid development in innovations have been observed (Mohammad et al., 2024). The spread of technology has created highly competitive markets where survival without adapting to new technologies is nearly impossible. Services hold a significant role in the banking sector, leading to the success of banks in staying competitive or exiting the market, as well as in maintaining, attracting, and influencing customers (Alhawamdeh et al., 2024; Mohammad et al., 2023). Banking services include a variety of benefits perceived by potential customers and those who plan to use or purchase the service. Banking services are known for their low costs and high-quality performance. Furthermore, electronic banking services are noted for their ease in reorganizing banking operations, as they require less manpower and result in lower costs (Zhu et al., 2020).

Mobile banking services are offered by banks to enable customers to manage their accounts and perform financial remote transactions via mobile communication devices. These services allow banks to deliver services to customers with access to banking functions at any given time and from any location, eliminating the need for branch visits (Singh & Srivastava, 2018). Mobile banking services use mobile devices like smartphones and tablets to connect with banking networks. These services enable users to oversee their accounts, obtain information, send money funds, and settle bills (Mohd Thas Thaker et al., 2019). A mobile application is a software program created for installation and use on the smart mobile phone. The quantity of mobile phone applications in Jordan has significantly increased, especially following the introduction of smartphones to the Jordanian market (Al-Adwan & Sammour, 2021; Alsabi et al., 2023).

The approval of mobile banking adoption is regarded as a part of the most groundbreaking subjects in financial technology data literature (Ahinful et al., 2024; Awamleh et al., 2024; Hilal & Varela-Neira, 2022; Paye Sr, 2024). As technology evolves rapidly, different frameworks for assessing technology acceptance have been used to evaluate the adoption of various innovations (Al-Dmour et al., 2021; Davis et al., 1989; Scherer et al., 2019). Since the advent of rapid technological advancement and the extensive discussion surrounding it, numerous theories have been proposed, including TAM (Al-Azzam, 2017; Davis et al., 1989), and with the rapid development, the Unified Theory of Acceptance and Use of Technology (UTAUT) has also emerged (Baptista & Oliveira, 2015; Le et al., 2020; Venkatesh et al., 2003). These two theories encompass several core elements, including Perceived Usefulness, Perceived Ease of Use, Perceived Risk, Performance Expectancy, Effort Expectancy, Trust, Social Influence, and Facilitating Conditions. Additionally, these two theories examine the effect of emerging technologies on individuals and the extent of their acceptance (Hussein et al., 2023; Marangunić & Granić, 2015; Venkatesh, 2015).

It is essential to recognize that the TAM model is commonly viewed as the most robust conceptual framework for assessing the effectiveness or success of mobile banking adoption. This is primarily because it provides a thorough evaluation framework, with its proposed relationships having been validated by several observational studies (Min et al., 2019; Scherer et al., 2019; Sultan et al., 2019). Secondly, there are numerous validated metrics available that can be utilized to assess the proposed success dimensions (Alalwan et al., 2016; Bakar et al., 2017). Thirdly, it is currently the leading measure among models used to evaluate success in mobile banking (Kala Kamdjoug et al., 2021; Picoto & Pinto, 2021). Finally, some re-

searchers contend that the model can be utilized at various levels of analysis, based on the goals and aims of the study (Alkhowaiter, 2020; Mohd Thas Thaker et al., 2019). Thus, previous research has investigated various components, or the entire model, with some studies modifying and expanding it by incorporating additional factors.

The benefits of various electronic banking services include enhancing a bank's competitive position and market share and leveraging modern technology to deliver these services, particularly through mobile phones. Mobile banking services can lower expenses. They provide faster financial transfers, and you do not need to visit your bank frequently to get historical records of all your transactions. Additionally, mobile banking applications let you adjust alerts to receive instant notifications, which increases trade and access to finance from the banks (Kida et al., 2018).

Mobile banking presents banks with various opportunities to boost revenue. These benefits encompass simplified analysis of customer data, enhanced instant availability of goods and services, and targeted marketing campaigns based on customer preferences collected by banks. Additionally, electronic banking services allow the bank to save costs and resources, with the added benefit of being available 24/7. In emerging economies, mobile banking diminishes the necessity for costly financial infrastructure, large investments like dedicated point-of-sale systems, and the opening of numerous new branches (Abayomi et al., 2019).

In recent years, several banks in Jordan, including the Bank of Jordan, Arab Bank, Jordan Islamic Bank, Arab Islamic Bank, Housing Bank for Trade and Finance, Ahli Bank, Jordan Kuwait Bank, and Cairo Amman Bank, have introduced mobile banking as an additional channel for offering a range of services to their clients (Alhawamdeh et al., 2024). A social media report shows that by the end of 2017, 62.3 percent of Jordan's population had internet access, a significant increase from 34.9 percent five years earlier (Al-Dmour et al., 2021). This equated to 8.7 million Jordanians having internet access, leading to a penetration rate of 87 percent. By the third quarter of 2016, 51% of these devic-

es were smartphones, with 82.21% operating on Android and 12.83% on iOS. Therefore, it can be inferred that the majority of Jordanians with smartphones use the Android operating system (International Telecommunication Union (ITU) (Al-Dmour et al., 2020).

This study will use TAM (Davis et al., 1989) as the fundamental model. The primary advantage of this model is its ability to assess and measure customers' willingness to use different types of technology. Additionally, researchers have added constructs from other theories to TAM, and additional variables have been incorporated to enhance the TAM model to align more closely with the culture in the Middle East. According to the TAM theory, perceived ease of use, perceived usefulness, and intention to use are the key predictors of behavioral intentions and the ultimate adoption and use of innovation (Davis, 1989). However, other studies have suggested additional constructs, including examples like perceived risk, trust, and social influence, to improve the TAM model's effectiveness (Ahmed, 2021; A. Al-Dmour et al., 2021; Al-Smadi, 2012; Alalwan et al., 2017).

The perceived usefulness of mobile banking enables clients to access services 24/7 (Mazana et al., 2016). Various financial professionals have given top ratings to using mobile banking, which benefits financial results. Davis (1989) specifies the perceived usefulness as "the extent to which a person believes that using a specific system would improve their job performance." Users have a greater probability to embrace mobile banking if they believe it offers benefits, such as saving time on bank visits and increasing efficiency (Malaquias & Silva, 2020). Similarly, Davis (1989) views perceived usefulness in a direct manner indicator regarding a user's intent to embrace the technology.

Research has demonstrated that Perceived Ease of Use significantly influences intent to use. It is also regarded as a crucial indicator of technology acceptance (Isa et al., 2020). Perceived ease of use denotes the extent to which users are ready to utilize a system without putting in significant exertion (Saleem et al., 2021). Studies revealed the ease of use: the amount of

effort and justification for using technology in the system compared to the return of this technology (Mohammad et al., 2023). Perceived usefulness and perceived ease of use influence the sustained usage of technology and are crucial factors in its adoption (Okocha & Awele Adibi, 2020). Empirical studies were conducted on perceived ease of use to ensure that it influences people's intention to use mobile banking among commercial banks in Jordan (Alalwan et al., 2016). On the other hand, Davis (1989) states that, although customers may think that a particular application is beneficial, concurrently they might think that system is hard to use. Martins et al. (2014) found a favorable outcome correlation between perceived ease of use and the intention to use mobile banking (Kim et al., 2021).

Perceived risk is described as the extent of uncertainty associated with the outcomes when using a new novelty (Tan & Leby Lau, 2016). Research indicates that perceptions of perceived risk are linked to consumers steering clear of new innovations (Malaquias & Hwang, 2016). Conversely the perceived risk is "the user's subjective expectation of suffering a loss in pursuit of the desired outcome" (Featherman & Pavlou, 2003). Risks associated with mobile banking include security of banking transactions, fraud, financial privacy, and information privacy concerns (Ashta, 2017). Additionally, customers are more apprehensive about disconnection problems, third-party involvement, electronic piracy, and cybercrimes. These concerns lead to greater fear of accepting online banking channels (Poon, 2008). The bank clients perceive risk in different manners, including the risk of financial loss or poor service quality (Forsythe & Shi, 2003).

Social influence pertains to advantages clients gain from social interactions, such as a sense of belonging and strengthened connections with others (Katz et al., 1973). It also describes how an individual's attitudes and behaviors shift based on the opinions of others regarding those behaviors (Venkatesh et al., 2003). On the one hand, social influence can be seen as a social benefit. It has been recognized as a social factor influencing individuals' intention to use

mobile banking. Social influence pertains to the extent to which individuals are swayed by other people's ideas regarding the use of the new system (Venkatesh et al., 2003). Social influence is an element that has a significant influence on customers more inclined to use new technology like mobile banking (Chong et al., 2012). It has been demonstrated that social influence significantly affects the adoption of mobile banking (Alalwan et al., 2016).

Trust encompasses customers' beliefs in integrity, honesty, and positive attributes of the banks (Luo et al., 2010). Also, trust means "the subjective probability with which customers believe that a particular transaction occurs in a manner consistent with their confident expectations" (Köksal, 2016). Initial trust evolves into ongoing trust through experiences and continued practice (Lu et al., 2010). Conversely, in mobile banking, trust can alleviate customers' concerns about the protection of their personal data and the safety of transactions. This, in turn, can encourage individuals to use mobile banking and increase its adoption (Lin, 2011). Many studies identify trust as a crucial factor driving customers' intention to embrace innovations like mobile banking services (Gu et al., 2009; Malaquias & Hwang, 2016). Trust has been recognized as a key element affecting customers' adoption of mobile banking. (Zhou, 2012). Numerous studies have consistently revealed that trust is a vital element in affecting mobile banking services for both traditional banking customers and those who are unbanked (Al-Dmour et al., 2021; Chiu et al., 2017).

## 2. AIMS AND HYPOTHESES

This study explores the elements shaping mobile banking adoption in Jordan through the lens of TAM. It aims to offer insights into user behavior and obstacles to adoption, enhancing the knowledge of technology acceptance in the Jordanian banking industry. The proposed hypotheses are presented as follows:

*H1: Perceived usefulness has a significant positive impact on the intention to use mobile banking.*

- H2: *Perceived ease of use has a significant positive effect on the intention to use mobile banking.*
- H3: *Perceived ease of use has a significant positive effect on perceived usefulness.*
- H4: *Perceived ease of use has a significant positive indirect effect on the intention to use mobile banking through perceived usefulness.*
- H5: *Perceived ease of use significantly positively impacts the intention to use mobile banking.*
- H6: *Social influence has a significant positive effect on the intention to use mobile banking.*
- H7: *Trust has a significant positive impact on the intention to use mobile banking.*

### 3. METHODS

This study utilized a quantitative research method with a survey questionnaire to investigate the elements influencing mobile banking adoption in Jordan. The questionnaire was created using validated scales from existing technology acceptance research and was circulated to a sample of banking customers in Jordan. The intended population was Jordanian consumers above 18 years of age who use banking services. A sample is more efficient than a comprehensive survey when dealing with large populations. Therefore, the primary data for this research were collected through the convenience sampling method. A non-random purposive judgment sampling method was used for this study. The purposive sampling method is the type of incredible sample that is most effective when you need to study a specific cultural area with knowledgeable experts inside (Etikan & Bala, 2017). A convenience sampling approach was utilized to select participants from major cities in Jordan. Data were collected using an electronic questionnaire delivered online and completed based on the convenience sampling technique. To ensure that the appropriate sample size was achieved, the study instrument was distributed via e-mail. 498 individuals completed a structured questionnaire, and 437 of them provided valid answers (87.8%).

- 1) Convenience of Mobile Banking Adoption (5 items) – adapted from Alalwan et al. (2017);
- 2) Perceived Usefulness (4 items) – adapted from Davis (1989);
- 3) Perceived Ease of Use (4 items) – adapted from Davis (1989);
- 4) Perceived Risk (4 items) – adapted from Featherman and Pavlou (2003);
- 5) Social Influence (4 items) – adapted from Venkatesh et al. (2012);
- 6) Trust (4 items) – adapted from Gefen et al. (2003).

The information was examined using SPSS for summary statistics and SmartPLS 4.0 for evaluating the assessment model and testing hypotheses through structural modeling. The two-step method suggested by Anderson and Gerbing (1988) was followed:

- 1) The measurement framework was evaluated through validity factor analysis. It was used to assess the reliability, the degree of agreement, and the distinctiveness of the constructs. This assessment was based on factor loadings, overall reliability, average variance extracted (AVE), Cronbach's alpha, and the Fornell-Larcker standard.
- 2) Evaluation of the structural model to test hypotheses by analyzing path coefficients and their importance through a bootstrapping and resampling technique procedure with 5,000 resamples. The mediation effect of perceived usefulness was examined using specific indirect effects; the coefficient of determination (R<sup>2</sup>) was also evaluated.

### 4. RESULTS

This section explores the findings of the study. The questionnaire was given out to 498 mobile banking users in Jordan, and 437 valid answers were obtained, leading to the answer and response rate of 87.8%. Table 1 displays the demographic profile of the participants and respondents.

**Table 1.** Demographic profile of the respondents

Variables	Answer	Freq	%
Age	Less than 30	116	26.5
	30 to 40	210	48.1
	40 to 50	77	17.6
	50 or more	34	7.8
	Total	437	100
Work sector	Banking and finance	165	37.8
	Business and management	70	16
	Healthcare	58	13.3
	Charity and voluntary work	32	7.3
	Engineering and manufacturing	99	22.7
	Other	13	3
	Total	437	100
Gender	Male	212	48.5
	Female	225	51.5
	Total	437	100
Income Level	Less than 500 JD	32	7.3
	500 to 1,000 JD	34	7.8
	1,000 to 1,500 JD	206	47.1
	1,500 to 2,000 JD	105	24
	2,000 JD and more	23	5.3
	I don't want to disclose	37	8.5
	Total	437	100
Education Level	Less than high school	16	3.7
	High school	34	7.8
	Bachelor	224	51.3
	Master	133	30.4
	Ph.D.	30	6.9
	Total	437	100
IT Background	Weak	45	10.3
	Average	76	17.4
	Good	316	72.3
	Total	437	100
Have you ever used a mobile banking application?	Yes	347	79.4
	No	90	20.6
	Total	437	100
What bank do you work for? or Which bank do you deal with?	Housing Bank	46	10.5
	Jordan Islamic Bank	108	24.7
	Jordan Kuwait Bank	26	5.9
	Bank of Jordan	7	1.6
	Cairo Amman Bank	107	24.5
	Islamic International Arab Bank	79	18.1
	Safwa Islamic Bank	9	2.1
	Capital Bank of Jordan	11	2.5
	Arab Bank	31	7.1
	Arab Jordan Investment Bank	13	3
	Total	437	100
What are the most mobile banking services offered by the bank?	Review the account statement	28	6.4
	Pay to a friend	18	4.1
	Pay bills	270	61.8
	Checkbook management	36	8.2
	Bank card management	52	11.9
	Transfer between accounts	17	3.9
	Other	16	3.7
Total	437	100	

The sample comprised nearly equal proportions of males (48.5%) and females (51.5%). The majority of respondents were aged between 30 and 40 years (48.1%), followed by those under 30 years (26.5%), between 40 and 50 years (17.6%), and 50 years or older (7.8%). Regarding the work sector, the largest proportion of respondents were from banking and finance (37.8%), followed by engineering and manufacturing (22.7%), healthcare (13.3%), business and management (16%), and charity/voluntary work (7.3%). The monthly income levels were primarily within the range of 1,000 to 1,500 JD (47.1%), followed by 1,500 to 2,000 JD (24%), 500 to 1,000 JD (7.8%), less than 500 JD (7.3%), and 2,000 JD or more (5.3%). In terms of education, most respondents and participants held a bachelor's degree (51.3%), followed by those with a master's degree (30.4%), high school diploma (7.8%), Ph.D. (6.9%), and less than a high school education (3.7%). Regarding IT background, most respondents considered themselves to have a good IT background (72.3%), with others rating it as average (17.4%) or weak (10.3%). Additionally, 79.4% of respondents reported having used mobile banking applications before. The banks used by respondents were Jordan Islamic Bank (24.7%), Cairo Amman Bank (24.5%), Islamic International Arab Bank (18.1%), Housing Bank (10.5%), and other banks (22.2%). The most frequently used mobile banking services included bill payment (61.8%), account review (6.4%), bank card management (11.9%), fund transfers (3.9%), and checkbook management (8.2%).

The summary statistics provide an overview of the average perceptions and variability in responses to the key factors influencing mobile banking adoption among Jordanian consumers. Table 2 shows the results of descriptive statistics.

Perceived ease of use had the greatest and highest average score of 4.077, indicating that respondents on average found mobile banking platforms highly easy to use and navigate. This was followed by the adoption of mobile banking intentions with a mean of 3.858, signifying a strong willingness to use mobile banking services. Perceived risk and trust had the same mean score of 3.848, ranking third. This suggests that while respondents perceived some risks in using mobile banking, they also had reasonably high levels of trust in the

**Table 2.** Descriptive statistics of the main study variables

Construct	No.	Mean	Standard deviation	Importance	Rank
Intention to Use Mobile Banking	5	3.858	0.791	High	2
Perceived Usefulness	4	3.695	0.815	High	6
Perceived Ease of Use	4	4.077	0.686	High	1
Perceived Risk	4	3.848	0.734	High	3
Social Influence	4	3.797	0.838	High	5
Trust	4	3.848	0.797	High	4

technology and banks providing mobile services. Social influence had a mean of 3.797, highlighting the important role played by referrals and opinions of friends, family, and peers in shaping mobile banking adoption decisions in Jordan's collectivist culture. Perceived usefulness had a relatively lower mean of 3.695 compared to the other constructs, though still at a high level. This indicates that while respondents agreed mobile banking offers various benefits, enhancing perceptions of its utility in managing finances can further increase adoption. Trust construct had a mean score of 3.848, indicating that respondents had moderately high levels of trust in mobile banking services, with some variability in individual responses. The standard deviations ranged from 0.686 to 0.838, indicating moderate variability in individual responses around the mean scores. Perceived ease of use had the lowest variation in responses, while social influence had the highest spread.

Normality testing was performed on all construct measures to confirm that the data were appropriate for parametric statistical analysis. This was done by assessing skewness and kurtosis values. Skewness examines the equivalence and symmetry of the distribution and dissemination, while kurtosis evaluates its level of peakedness (Westfall & Henning, 2013). For skewness, values between  $-1.96$  and  $+1.96$  are deemed acceptable to indicate a normal univariate distribution (Gravetter & Wallnau, 2014). The kurtosis values should be be-

tween  $-3$  and  $+3$  to be considered normally distributed (Gerhard et al., 2015; Kline, 2015). If skewness and kurtosis fall outside the recommended ranges, the data are deemed non-normal. Table 3 presents the results of the normality statistics.

Table 3 shows that the skewness values for all constructs varied from  $-1.033$  to  $-0.604$ , while the kurtosis values ranged from 0.173 to 1.467. Since all values are within the acceptable limits, the data can be considered to follow a normal distribution.

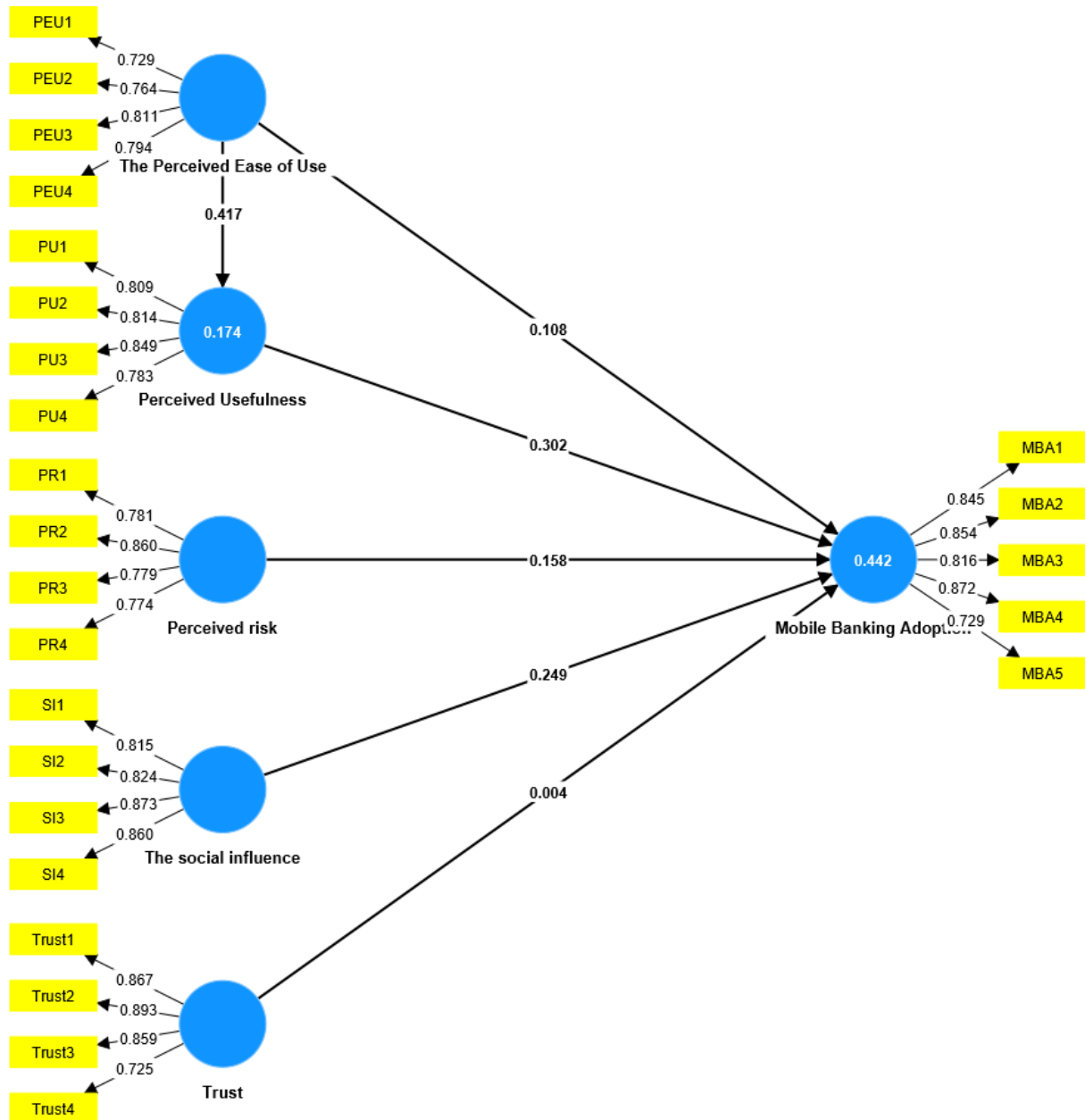
Factor loadings were evaluated to determine the accuracy of the assessment models before examining the structural relationships. These loadings reflect the correlation between the survey items and their corresponding constructs. Loadings were estimated using confirmatory factor analysis in SmartPLS 4.0. Typically, loadings should be 0.7 or higher to ensure sufficient convergent validity (Hair Jr et al., 2017). Loadings between 0.4 and 0.7 are considered acceptable if other items within the construct have high loadings. Loadings below 0.4 should be removed (Hulland, 1999). Figure 1 displays the factor loadings and path parameters.

As shown in Figure 1, all items had loadings exceeding 0.7. Specifically, mobile banking adoption items ranged from 0.729 to 0.872. Perceived usefulness items ranged from 0.783 to 0.849. Perceived ease of use varied from 0.729 to 0.811. Perceived

**Table 3.** Normality statistics of study variables

Variables	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Intention to Use Mobile Banking	-0.757	0.117	0.300	0.233
Perceived Usefulness.	-0.604	0.117	0.173	0.233
Perceived Ease of Use	-1.033	0.117	1.467	0.233
Perceived Risk	-0.668	0.117	0.732	0.233
Social Influence	-0.791	0.117	0.376	0.233
Trust	-0.768	0.117	0.347	0.233





**Figure 1.** Factor loading and path coefficient statistics

risk items ranged from 0.774 to 0.860. Social influence item loadings spanned from 0.815 to 0.873. Trust items ranged between 0.725 and 0.893.

The Fornell-Larcker test assesses the validity of constructs by comparing the square root of each construct's Average Variance Extracted (AVE) to the correlations among constructs (Fornell & Larcker, 1981). To establish discriminant validity, the square root of the Average Variance Extracted (AVE) for each construct should exceed its correlations with other constructs. Table 4 presents the results of the Fornell-Larcker criterion.

Table 4 shows that all diagonal AVE square root values exceeded the off-diagonal correlations, satisfying the discriminant validity criterion.

Convergent validity was evaluated to verify that the evaluation items accurately represent their respective constructs. This evaluation was conducted using Cronbach's alpha, composite reliability, and average variance extracted (AVE), following the recommendations of Hair Jr et al. (2017). Table 5 presents the findings for Cronbach's alpha, composite reliability, and average variance extracted (AVE).

**Table 4.** Fornell-Larcker criterion statistics

Variable	1	2	3	4	5	6
Intention to Use Mobile Banking	0.825	–	–	–	–	–
Perceived Usefulness	0.562	0.814	–	–	–	–
Perceived risk	0.541	0.538	0.799	–	–	–
Perceived Ease of Use	0.429	0.417	0.516	0.775	–	–
Social Influence	0.560	0.518	0.655	0.451	0.843	–
Trust	0.354	0.357	0.420	0.396	0.536	0.838

**Table 5.** Cronbach’s alpha, composite reliability, and average variance extracted

Variable	Cronbach’s alpha	Composite reliability	Average variance extracted (AVE)
Intention to Use Mobile Banking	0.881	0.914	0.680
Perceived Usefulness	0.830	0.887	0.663
Perceived Risk	0.811	0.876	0.639
Perceived Ease of Use	0.781	0.857	0.601
Social Influence	0.865	0.908	0.711
Trust	0.862	0.904	0.703



**Figure 2.** Path analysis statistics

**Table 6.** Path analysis (hypothesis testing)

Path	Coef.	STDEV	T statistics	P values
Perceived Usefulness → Mobile Banking Adoption	0.302	0.048	6.253	0.000
Perceived risk → Mobile Banking Adoption	0.158	0.052	3.034	0.002
Perceived Ease of Use → Mobile Banking Adoption	0.108	0.049	2.212	0.027
Perceived Ease of Use → Perceived Usefulness	0.417	0.046	9.094	0.000
Social Influence → Mobile Banking Adoption	0.249	0.055	4.570	0.000
Trust → Mobile Banking Adoption	0.004	0.046	0.085	0.932
Perceived Ease of Use → Perceived Usefulness → Mobile Banking Adoption	0.126	0.026	4.878	0.000

Cronbach's alpha assesses the internal consistency by evaluating the correlations between items. Values of 0.7 or higher indicate strong reliability (Nunnally, 1994). As shown in Table 5, Cronbach's alpha ranged from 0.781 to 0.924, all exceeding the 0.7 threshold for each construct. Composite reliability, which measures the overall dependability of a construct, showed satisfactory values between 0.70 and 0.90 (Nunnally, 1994). Table 6 shows that composite reliability values for all constructs ranged from 0.796 to 0.951, exceeding the acceptable threshold. The Average Variance Extracted (AVE) assesses the proportion of variance captured by indicators compared to measurement error, with an AVE of 0.5 or above signifying adequate convergence (Fornell & Larcker, 1981). Table 6 shows AVE values ranging from 0.594 to 0.711, all surpassing the 0.5 threshold.

The suggested relationships in the research model were analyzed using path analysis in SmartPLS 4.0. Table 6 outlines the basis for hypothesis testing, including the significance and direction of effects. Figure 2 shows the path analysis testing.

## 5. DISCUSSION

The results show that perceived usefulness has a positive path coefficient of 0.302 with mobile banking adoption, and the t-value is 6.253 ( $p < 0.001$ ). Therefore, hypothesis *H1* is supported. This indicates that perceived usefulness significantly and positively impacts customers' adoption of mobile banking in Jordan, with a medium effect size. This suggests that when customers perceive mobile banking as providing valuable benefits such as quick access to services, convenient financial management, and the ability to better monitor and control, they are more likely to use mobile banking platforms. The finding aligns with technology acceptance models and underlines that usefulness

is a key driver of adoption. Banks should elevate the usefulness of mobile banking – anytime anywhere access, managing finances on-the-go, remote payments and transfers, etc. to attract customers (Davis, 1989; Malaquias & Silva, 2020).

The path coefficient from perceived ease of use to adoption of mobile banking is 0.108, with a t-value of 2.212 ( $p < 0.05$ ). This supports hypothesis *H2*, indicating that perceived ease of use has a small but significant positive impact on customers' mobile banking adoption intentions. This finding aligns with prior technology acceptance research and indicates that when customers comprehend mobile banking platforms to be more effortless to use, learn, and navigate, they develop more favorable intentions to start using mobile banking. The intuitive, user-friendly design of mobile apps and websites positively shapes adoption decisions. Thus, banks should focus on improving ease of use elements like simplicity of interfaces, convenience of access and navigation, and clarity of features to drive adoption (Isa et al., 2020).

Perceived ease of use has a substantial positive impact on perceived usefulness, with a path coefficient of 0.417 and a t-value of 9.094 ( $p < 0.001$ ). Hypothesis *H3* is strongly supported. This aligns with prior technology acceptance research showing that greater ease of use perceptions enhance usefulness beliefs. This relationship aligns with prior technology acceptance research. When customers find mobile banking platforms easier to use, their perception of usefulness and resultant benefits are enhanced. Improving ease of use through better navigation, clarity, customization, and tutorials increases usefulness perceptions to positively influence adoption.

The specific indirect impact of perceived ease of use on mobile banking adoption through the mediator perceived usefulness has a coefficient of

0.126 and a t-value of 4.878 ( $p < 0.001$ ). This supports hypothesis *H4*. Perceived ease of use positively affects adoption both directly and indirectly by increasing usefulness perceptions. Perceived risk has a positive path coefficient of 0.158 and a t-value of 3.034 ( $p < 0.01$ ) with mobile banking adoption. While significant at the 1% level, the direction of the effect is positive, contrary to the hypothesized negative relationship. Thus, hypothesis *H5* is not supported. The results suggest that perceived risk has a small positive influence on mobile banking adoption, which is unexpected and warrants further investigation. This suggests that greater perceptions of risks like financial loss, security, and privacy threats make customers more hesitant to adopt mobile banking. Concerns about risks of hacking, fraudulent transactions, and disclosure of personal data create barriers to using mobile platforms for banking. Banks need to implement robust security safeguards and clearly communicate assurances to customers to mitigate risk perceptions and build trust (Alalwan et al., 2016; Hanafizadeh et al., 2014).

The path coefficient from social influence to mobile banking adoption is 0.249, with a t-value of 4.570 ( $p < 0.001$ ). Hypothesis *H6* is supported, confirming that social influence has a significant positive effect on customers' intentions to adopt mobile banking services. The effect size is small to medium. This infers that positive opinions, referrals, and encouragement from family, friends, colleagues, and wider social networks significantly sway customers' intentions to adopt mobile bank-

ing services. In collectivist cultures like Jordan, adoption decisions are heavily influenced by important referent groups. Banks should leverage word-of-mouth and social channels to promote mobile banking adoption (Chong et al., 2012; Venkatesh et al., 2003).

Trust has a very small positive path coefficient of 0.004 with mobile banking adoption, and the t-value is only 0.085 ( $p > 0.05$ ). The effect is not statistically significant. Hence, hypothesis *H7* is not supported. Trust does not appear to directly influence mobile banking adoption in the Jordanian context. One explanation could be trust is an antecedent to usefulness and risk perceptions which directly shape adoption intentions. Also, the initial trial may develop trust rather than vice versa. Banks should not rely solely on building general trust perceptions but rather emphasize usefulness and mitigating risks to drive adoption (Koksal, 2016; Luo et al., 2010).

In summary, the path analysis results support hypotheses *H1*, *H2*, *H3*, *H6*, and *H4*, while *H5* and *H7* are not supported. Perceived usefulness, ease of use, and social influence have significant positive effects on mobile banking adoption intentions, with usefulness having the strongest influence. Perceived risk unexpectedly has a small positive effect rather than the hypothesized negative effect. Trust does not significantly affect adoption. Additionally, perceived ease of use impacts adoption both directly and indirectly through perceived usefulness (Prastiawan et al., 2021).

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## CONCLUSION

Through applying TAM, this study emphasizes the critical elements affecting mobile banking adoption in Jordan. Moreover, it aims to shed light on user behavior and adoption challenges, thereby advancing the understanding of technology acceptance in the Jordanian banking sector. The findings underscore the significant positive effects of perceived usefulness, ease of use, and social influence on the intention to adopt mobile banking, with perceived usefulness emerging as the most significant factor. Interestingly, contrary to common expectations, perceived risk was found to have a small positive impact on adoption intentions rather than the hypothesized negative effect. This counterintuitive result suggests that users may recognize and accept certain risks associated with mobile banking if they perceive substantial benefits. Moreover, the study reveals that trust does not significantly affect mobile banking adoption, suggesting that other factors might be more critical in users' decision-making processes. Finally, perceived ease of use not only has a direct effect on adoption intentions but also indirectly influences them through perceived usefulness. These insights can help financial institutions and app developers to better understand user behavior and refine their strategies to enhance mobile banking adoption.

## AUTHOR CONTRIBUTIONS

Conceptualization: Bara Waleed Rababa, Azwadi Ali, Al Montaser Mohammad.

Data curation: Al Montaser Mohammad.

Formal analysis: Bara Waleed Rababa, Azwadi Ali.

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Investigation: Bara Waleed Rababa, Azwadi Ali.

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