

Mobile Banking Behaviour of Austrians and Romanians – The Role of Espoused Cultural Values

Ana D. Domuta and Christine Strauss

University of Vienna, Department of Marketing and International Business, Oskar Morgenstern Platz 1, 1090 Vienna, Austria

Abstract

Mobile banking has received researchers' attention since the appearance of mobile phones. However, applications have become a crucial factor in financial institutions' strategy with the outbreak of the pandemic. Motivated by the lack of studies on cultural variations in mobile banking acceptance and scarce research which directly measured culture, this paper aimed at investigating how culture at the individual level of analysis impacts the relationship between technology acceptance factors and adoption intention of mobile banking applications in Austria and Romania. Data was gathered through a bilingual survey resulting in 196 Austrian and 229 Romanian participants. The moderated multiple regression analyses revealed that culture influenced adoption intention of mobile banking applications through the interaction with technology acceptance factors. The present findings have implications for future research and financial institutions' marketing strategy of mobile banking.

Keywords

Cultural Differences, Espoused Cultural Values, Technology Acceptance, Mobile banking

1. Introduction

Mobile banking is recognized as being “among the latest in a series of recent mobile technological wonders to impact daily life activities and the financial sector” [1]. The catalyst for the increased public interest in mobile banking is believed to be the application version [2]. Due to the simple authentication procedure, possibility to access financial information from anywhere, flexibility to transfer money or monitor spendings, mobile banking applications have gained widespread interest among consumers [3, 4]. In addition, the lockdowns during the pandemic pressured financial institutions to double down efforts on digitalization strategies. Consequently, mobile banking apps' functionalities expanded beyond traditional financial management [5].

Although increasingly expanding on the market, mobile banking has still not reached its full potential. Customers still appear to prefer using their computer or going to their local bank for managing their personal account, looking for product information or active investing [5]. Additionally, apps can be plagued by security risks through potential phone theft, Wi-Fi hacking, or fraudulent alerts [6].

On a country level, Austrians and Romanians adoption of online banking differs to a great degree. The adoption rates of internet banking in 2022 were 73.13% in Austria and 19.19% in Romania [7], and these are expected to reach 76.54% for Austrians and 23.71% for Romanians in 2023 [8]. This could be explained by the number of credit institutions available, Austria having 470 as of 2021, whilst Romania 71 [9]. Moreover, Austrians tend to be more comfortable using digital financial services (57%) compared to 44% of Romanians [10]. Although being geographically close to each other and ranking among the developed countries [11], Austria and Romania have different technological, economic, and cultural premises.

SCIA-2023: 2nd International Workshop on Social Communication and Information Activity in Digital Humanities, November 9, 2023, Lviv, Ukraine

EMAIL: ana.domuta@hotmail.de (A. Domuta); christine.strauss@univie.ac.at (C. Strauss)

ORCID: 0009-0001-9868-0264 (A. Domuta); 0000-0003-0276-3610 (C. Strauss)



© 2023 Copyright for this paper by its authors.

Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

CEUR Workshop Proceedings (CEUR-WS.org)

Adoption rates of technology have been explained in the literature by theoretical models, such as the Theory of Planned Behaviour [12], the Theory of Reasoned Action [13] or the Technology Acceptance Model [14]. However, one of the most complex frameworks is the Unified Theory of Acceptance and Use of Technology (UTAUT) [15]. In recent years, there has been considerable interest in mobile banking, yet few researchers addressed the specific context of mobile banking applications. Additionally, most cross-cultural studies focused on comparisons between two or multiple countries, however, only a limited number of studies investigated the impact of culture at the individual level of analysis. Consequently, this paper seeks to advance the understanding of mobile banking by investigating the moderation effects of culture on the relationship between technology acceptance factors and adoption intention in Austria and Romania. The decision to measure culture is based on previous critique on using the country scores from Hofstede [16] to account for cultural differences [17, 18]. Therefore, this work intends to respond to the following research question:

RQ. *How does culture at the individual level of analysis impact on the relationship between technology acceptance factors and adoption intention of mobile banking applications?*

The answering of this research question may prove helpful from a managerial perspective for international banks which offer mobile banking services in the Romanian and Austrian business context, such as Revolut, Erste Bank, Raiffeisen or ING.

The remainder of this paper is organized as follows: Section 2 lays out the state of art of cultural moderation effects of mobile banking adoption. Section 3 introduces the conceptual model and expected moderation effects. Section 4 discusses the research methodology, including data collection and instrumentation. Section 5 summarizes the major results, discussion, and future research recommendations, while section 6 derives the conclusion.

2. Cultural variations of Mobile Banking Adoption

A few studies have attempted to investigate moderation effects of culture in the context of mobile banking adoption. Tam and Oliveira [19] found that individualism moderated the relationship between task technology fit (TTF) and use, such that participants in Portugal exerting high levels of individualism were less concerned by how well mobile banking matches their task requirements. Contrary to the authors' expectations, uncertainty avoidance did not moderate the effect of TTF on use. Although the authors used only two of Hofstede's [16] cultural indicators, their inclusion in the model increased the explained variance in mobile banking use by 8.1%. Zhang et al. [20] analysed the results of 62 studies and found that individuals in low power distance, high individualistic, high feminine, and high uncertainty avoidance cultures put more emphasis on the relative advantages a new technology offers when considering adoption. High individualistic countries were found to be more influenced by the effort expectancy in the adoption intention compared to societies with more collective values. By contrary, masculinity moderated the relationships between performance expectancy, social influence, and use intention. Consequently, high feminine cultures appear to be more concerned with performance considerations, whereas cultures defined by masculine values should be more influenced by the social environment in the adoption intention of electronic banking.

Picoto and Pinto [21] compared the adoption of mobile banking in Brazil, India, the UK, and the US, and found that power distance impacted the relation between the intention and actual use of mobile banking, such that high power distance was found to positively influence actual use through the interaction with behavioral intention. Furthermore, Khan [22] investigated the moderation effects of culture on the relationship between the behavioral intention to adopt mobile banking and actual use in Pakistan and China and found that uncertainty avoidance and power distance negatively moderated the relationship between intention and usage for Pakistani sample, yet not for the Chinese sample.

Collectively, the literature on cultural moderation effects on the relationship between technology acceptance factors and mobile banking adoption appears to be very scarce compared to research on adoption factors. In addition, most studies focus on cultural moderation effects between intention and actual use of mobile banking. Consequently, the contribution of individual culture to the effect of technology acceptance factors on mobile banking adoption remains unclear. A systematic review of 76 manuscripts published between 2005 and 2019 on mobile banking argued that the lack of cultural research might be due to the difficulty of data collection and analysis [23]. In addition, most research

comparing two or multiple countries [19, 20] did not measure culture and attributed the results to differences in the behaviour of individuals as proposed by Hofstede [16]. However, Srite and Karahanna [18] state that culture is formed through individual values, which are combined to create the culture of a group. The authors suggest that, at the individual level of analysis, culture is formed through “espoused cultural values” which they define as the extent to which the identity of a person is rooted in their national culture [18]. Hence, assuming that all individuals living in a country exert the same cultural values might be problematic, especially due to the high migration in certain countries over the past decades. The findings of McCoy et al. [17] provide further support for the measurement of culture instead of the use of Hofstede’s values in cross-cultural research.

Furthermore, there is limited research conducted in Austria and Romania. A reason may be that Austria is a small country and researchers tend to focus on Germany due to similar cultural conditions. As for Romania, poor economic conditions and high migration rates of the younger population, for which mobile banking could be more attractive, may lower the interest of researchers. Nevertheless, the cultural dimensions of each country, as found by the study of Hofstede [16] and highlighted in Figure 1, provide a good basis for comparison.

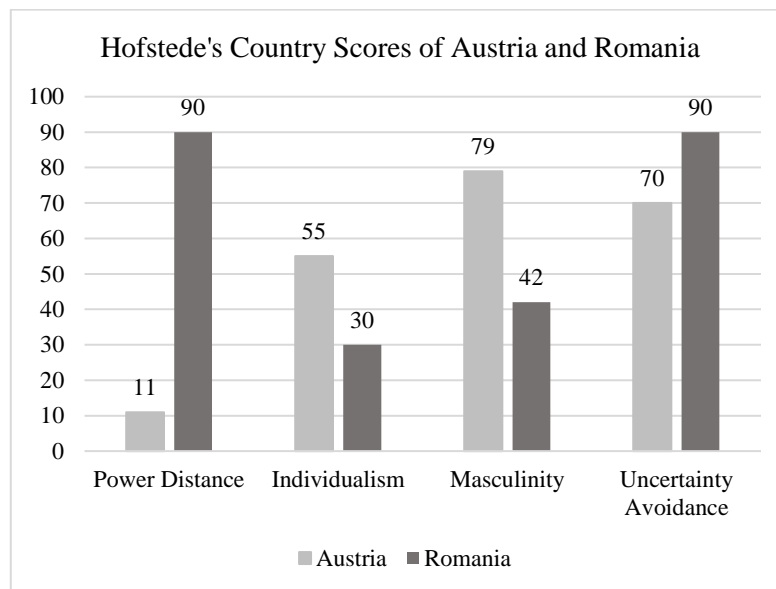


Figure 1: Country scores of Austria and Romania as defined by Hofstede

In light of shortcomings of direct culture measurement in previous research, neglected Austrian and Romanian areas, limited research on mobile banking applications and moderation effects between technology adoption factors and adoption intention, this paper aims to respond to these limitations through the theoretical model and underlying hypotheses presented in the next section.

3. Research Model and Hypotheses Development

This section examines the moderation of cultural factors on the relationship between technology acceptance factors and mobile banking acceptance for the development of the hypotheses highlighted by solid black arrows in the research model from Figure 2. The dashed black arrows represent additionally tested moderations and direct effects which could not be backed up by literature. The grey arrows and areas represent direct and moderation effects investigated as part of a broader research project, which were not included in this paper.

The conceptual model highlighted in this paper includes the espoused cultural values as defined by the study of Srite and Karahanna [18] and included in the sections below.

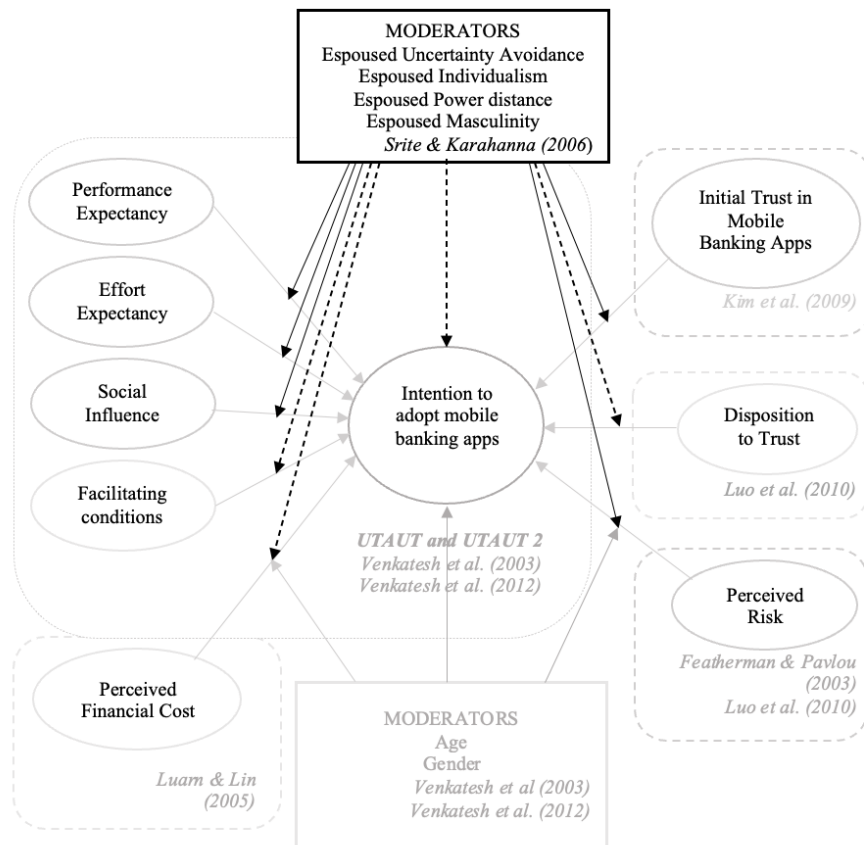


Figure 2: Conceptual model of intention to adopt mobile banking apps with moderation effects

3.1 Espoused Masculinity and Femininity

Srite and Karahanna [18] define “espoused masculinity” as the “degree to which gender inequalities are espoused by an individual”. Yoon [24] found that high levels of masculinity positively influence the relationship between perceived usefulness and intention to use an online shopping mall, and negatively the perceived ease of use and usage intention. In line with this finding, Tarhini et al. [25] assumed that individuals exerting masculine values were more interested in the instrumentality and features of a technology compared to individuals with more feminine values. Moreover, the relationship between effort expectancy and intention to use an online shopping mall was found to be stronger for more feminine cultures [24]. Several studies confirmed this expectation based on the rationale that feminine cultures are more influenced by hedonic experiences when evaluating technology acceptance [25, 18]. Considering the impact of social influences, Srite and Karahanna [18] found that subjective norms influenced individuals with espoused feminine values to a greater degree compared to individuals exerting more masculine values to adopt a certain technology. As Hallikainen and Laukkanen [26] suggest, individuals in feminine cultures are more interested in “fostering harmonious relationships and values”. Consequently, trust should be more important for individuals espousing more feminine values. In addition, masculinity was found to be related to financial risk taking, such that individuals exerting more feminine values would tend to be more sensitive to risks involved in using a technology [27]. Based on above research findings, the following moderation effects are proposed:

H1a. The relationship between performance expectancy and intention to adopt mobile banking apps will be stronger for individuals with high espoused masculine values.

H2a. The relationship between effort expectancy and intention to adopt mobile banking apps will be stronger for individuals with low espoused masculine values.

H3a. The relationship between social influence and intention to adopt mobile banking apps will be weaker for individuals with high espoused masculine values.

H4a. The relationship between initial trust and intention to adopt mobile banking apps will be stronger for individuals with low espoused masculine values.

H5c. The relationship between perceived risk and intention to adopt mobile banking apps will be stronger for individuals with low espoused masculine values.

3.2 Espoused Individualism and Collectivism

The difference between espoused individualism and collectivism lies in the “degree to which the individual emphasizes his/her own needs as opposed to the group needs and prefer to act as an individual rather than as a member of a group” [18]. Sun and Zhang [28] propose that people in collectivistic countries are more likely to rely on each other and, hence, would ask others for their opinion on the benefits of a technology. The expectation is confirmed in the electronic commerce context by Pavlou and Chai [29]. The authors found that in the collectivistic Chinese culture, individuals are more influenced by societal norms compared to individuals from more individualistic societies when conducting online transactions. Similarly, innovation factors, usefulness and ease of use were found to be more pronounced in influencing the adoption of mobile phones in an individualistic country, in comparison to a collectivistic society characterized by reliance on subjective norms and word of mouth [30]. Zhang et al. [20] confirmed that the relationships between performance expectancy, effort expectancy and behavioural intention to adopt mobile banking are positively moderated by individualism, such that in countries with high individualism levels, the performance expected from the service and the ease of use are more important drivers of the use intention compared to countries characterized by high collectivism. In addition, Zhang et al. [20] found that individualism positively moderating the relationship between perceived risk and use intention. Hence, individuals exerting high levels of individualism may be more affected by potential threats, as they tend to rely less on others. By contrast, members in collectivistic societies often benefit from trustful behaviours towards one another and might be more influenced by peers [31]. Consequently, the following hypotheses are proposed:

H1b. The relationship between performance expectancy and intention to adopt mobile banking apps will be stronger for individuals with high espoused individualistic values.

H2b. The relationship between effort expectancy and intention to adopt mobile banking apps will be stronger for individuals with high espoused individualistic values.

H3b. The relationship between social influence and intention to adopt mobile banking apps will be weaker for individuals with high espoused individualistic values.

H4b. The relationship between initial trust and intention to adopt mobile banking apps will be weaker for individuals with high espoused individualistic values.

H5b. The relationship between perceived risk and intention to adopt mobile banking apps will be stronger for individuals with high espoused individualistic values.

3.3 Espoused Power Distance

Power distance refers to the “degree to which large differentials of power and inequality are accepted as normal by the individual” [18]. In the context of internet and mobile banking, power distance was found to negatively moderate the relationship between performance expectancy and behavioural intention [20]. Similarly, Tarhini et al. [25] argued that low power distance individuals do not make their choices based on other people’s opinion, and, therefore, expect more usefulness from a service compared to individuals exerting high power distance levels. In high power distance countries, individuals are expected to comply with the instructions of superiors and, hence, rely on the information of others to decide whether to adopt a certain technology or not [28, 32]. In a similar vein, Srite and Karahanna [18] argue that espoused power distance moderates the relationship between subjective norms and behavioural intention through compliance, such that in high power distance societies, individuals comply with the rules and orders imposed by superiors. Consequently, they may be more easily influenced in their decisions by their social environment. Zhang et al. [20] propose that in more egalitarian countries, individuals are more curious about innovations and may not perceive a high effort in accepting a new technology. Moreover, trust may play a more important role for individuals in high power distance countries as mobile banking is a virtual service and the lack of closeness with superiors

may make individuals more cautious about adopting new technologies [20]. In addition, Zhang et al. [20] argue that in low power distance countries, individuals may be more risk averse towards new technologies, as they are responsible for the choices they make and may not fully understand the risks such a service may involve. Hence, the following moderation effects are proposed:

H1c. The relationship between performance expectancy and intention to adopt mobile banking apps will be weaker for individuals with high espoused power distance values.

H2c. The relationship between effort expectancy and intention to adopt mobile banking apps will be stronger for individuals with low espoused power distance values.

H3c. The relationship between social influence and intention to adopt mobile banking will be stronger for individuals with high espoused power distance values.

H4c. The relationship between initial trust and intention to adopt mobile banking will be stronger for individuals with high espoused power distance values.

H5c. The relationship between perceived risk and intention to adopt mobile banking will be stronger for individuals with low espoused power distance values.

3.4 Espoused Uncertainty Avoidance

According to Srite and Karahanna [18], uncertainty avoidance defines the “level of risk accepted by the individual, which can be gleaned by his/her emphasis on rule obedience, ritual behavior, and labour mobility”. Individuals from high uncertainty avoidance culture are expected to be more prone to listen to the opinion of others as a mean to reduce their own uncertainty. Dawar et al. [33] found that high uncertainty avoidance is negatively correlated to information seeking from impersonal sources, such as consumer magazines, but positively with personal sources, such as friends or relatives. Hence, social influences should strongly influence behavioural intentions of individuals with high uncertainty avoidance. Moreover, high levels of uncertainty avoidance at the country level of analysis were found to negatively influence the relationship between perceived usefulness and the intention to shop online and between trust and behavioural intention [24]. Similar results were reported by Lee et al. [30] who found that low uncertainty avoidance has a stronger impact on usefulness and ease of use compared to subjective norms and word of mouth. Individuals are more likely to adopt new technologies if they have low uncertainty avoidance levels, whereas they are more likely to be influenced by the opinion of others the higher their uncertainty avoidance is. In addition, Zhang et al. [20] found that trust may play a decisive role in the adoption intention of mobile banking services for individuals exerting high levels of uncertainty avoidance. The results are confirmed by Zhou et al. [34] who reported that high uncertainty avoidance negatively influences the intention to purchase from a new website. Furthermore, high uncertainty avoidance was found to negatively moderate the relationship between perceived risk and technology acceptance [20]. Consequently, the following moderation effects are expected:

H1d. The relationship between performance expectancy and intention to adopt mobile banking apps will be weaker for individuals with high espoused uncertainty avoidance values.

H2d. The relationship between effort expectancy and intention to adopt mobile banking apps will be weaker for individuals with high espoused uncertainty avoidance values.

H3d. The relationship between social influence and intention to adopt mobile banking apps will be stronger for individuals with high espoused uncertainty avoidance values.

H4d. The relationship between initial trust and intention to adopt mobile banking apps will be weaker for individuals with high espoused uncertainty avoidance values.

H5d. The relationship between perceived risk and intention to adopt mobile banking apps will be weaker for individuals with high espoused uncertainty avoidance values.

4. Research Methodology

This section presents the approaches followed to collect data in Austria and Romania, and the instruments used for the measurement of variables.

4.1 Data Collection

The participants received a survey which was translated into German and Romanian. The inclusion criteria were: Austrian or Romanian nationality, possession of a bank account and mobile phone, and familiarity with mobile banking applications.

To search for participants and achieve a heterogeneous sample, several methods were used. Firstly, a non-probabilistic snowball method was implemented. From a close network of acquaintances, each was required to ask five additional individuals. This allowed us to enter other social networks and achieve a more diversified sample. Secondly, the survey link was posted on more than 30 groups on Facebook, out of which 15 were directed to scientific purposes. The survey groups were based on reciprocity, as each participant was required to complete the other person's survey. Thirdly, the survey was posted on SurveyCircle, a platform which provides support with finding research participants. The benefit of this platform over Facebook groups was the possibility of participants to gather points for survey completion. The survey appears on a ranking list and moves upward the more studies the survey manager completes. The survey appeared for a few weeks on the first place. However, due to the nature of the platform and incentive in form of points, some questionnaires were not correctly filled out and these resulted in elimination from analysis. To incentivize final participation on the platform, a donation pledge of 50 Cent per survey was offered, which was directed to a dog shelter in Romania. In sum, 10 Euros were gathered. The data collection in Romania followed mainly the snowball principle, as such Facebook groups and websites were not available. To promote participation, the study was posted in university groups and marketplaces on Facebook. As there were more female than male individuals who completed the survey, the participation of men was increased by posts in both countries in several car selling or single father groups on Facebook.

A total of 425 participants were gathered, out of which 196 were Austrians and 229 Romanians.

4.2 Instrumentation

To operationalize the moderator variables in this paper, the measurement of the individual culture of participants was adapted from the work of Srite and Karahanna [18]. Some of the statements were reformulated or simplified based on feedback from pre-tests. The feedback included mainly wording of the statements and scale layouts.

All items were measured based on a 6-points Likert scale. The decision to exclude the middle option was taken to pressure participants to decide for a direction of preference. The advantage lies in more reliable data, as it excludes uncertainty. Nevertheless, individuals may feel uncertain about certain statements and chose an option out of necessity. This drawback is considered as a limitation of results.

5. Results and Discussion

To verify whether individual espoused cultural values moderate the relationships between technology acceptance factors and mobile banking apps adoption intention, hierarchical moderated multiple regression analyses were conducted. The data was analysed using the STATA software and the variables were introduced in the model in the following order. In a first step, the technology acceptance factors were introduced: performance expectancy (PE), effort expectancy (EE), social influences (SI), facilitating conditions (FC), perceived financial cost (PFC), initial trust (IT), disposition to trust (DT) and perceived risk (PR). In a second step, the moderators, masculinity/femininity (MF), individualism/collectivism (IC), power distance (PD) and uncertainty avoidance (UA) were introduced. In a third step, the moderation relationships were introduced following the order of the variables previously described, for example: MFxPE, MFxEE, MFxSI, etc.

The sections below highlight the results of these analyses, including the comparison between the country scores of Romania and Austria from the research of Hofstede [16] and the espoused cultural values found in this study, the limitations, and recommendations for future research.

5.1 National Culture and Espoused Cultural Values

Considering that the country scores from Hofstede's research were developed more than 40 years ago and a few studies stressed the importance of using individual cultural values in cross-cultural research [17, 18], an analysis to investigate the differences between the country scores and espoused cultural values was conducted through t-tests by country. The null hypothesis states that the difference between Austrians and Romanians regarding the variables are equal to zero, whereas the alternative hypotheses state that the mean of Austrians is smaller, unequal to zero or greater than the mean of Romanians. The test investigates the smallest significance level at which the null hypothesis can be rejected. Throughout this paper, the 10% minimum significance level was used.

The results showed that Austrians tend to have lower masculinity and uncertainty avoidance compared to Romanians. Whereas the difference in uncertainty avoidance levels replicates the one proposed by Hofstede [16], the masculinity values seem to have reversed. Hofstede [16] found a lower level of masculinity for Romania than for Austria. In addition, the difference between the means of power distance for Austrians and Romanians was found to be only marginally significant. Accounting for the great discrepancy presented in the study of Hofstede [16], the result suggests that acceptance of inequality is less pronounced in Romania compared to 40 years ago. The individualism levels are relatively low and in accordance with the difference found by Hofstede [16].

5.2 Espoused Cultural Values and Mobile Banking Acceptance

To account for the contribution effect of multiple explanatory variables to the outcome based on participants espoused cultural values, multiple moderated hierarchical analyses were conducted. Each section presents the moderation results for the entire sample and individual country.

5.2.1 Masculinity and Femininity

Among the entire sample, the moderation effects of espoused masculinity were significant for the relationships between performance expectancy ($\beta = -.104$, $p = .033$) and behavioural intention, however with a reversed effect as initially hypothesized. Hence, **H1a** is not supported. Participants with high masculinity were less concerned with the performance expected from the service compared to individuals with more feminine values. The finding contradicts evidence provided by Srite and Karahanna [18] who found no significant effect of masculinity on the relationship between performance expectancy and adoption intention of computer or personal digital assistants (PDAs). Individuals with more feminine values should be more concerned with performance derived from the use of technology. Considering that potential system failures of mobile banking applications, such as crashes while conducting payments, could occur, individuals with more feminine values could be more concerned with the functionality and accurate process of transactions to avoid such potential risks.

The espoused masculinity was found to marginally moderate the relationship between effort expectancy and behavioural intention among all participants ($\beta = .088$, $p = .064$), however with a reversed effect, providing no support for **H2a**. The result is consistent with findings from Tarhini et al. [25] on e-learning and Srite and Karahanna [18] on PDAs but contradicts the results of Zhang et al. [20]. According to the latter, high masculinity should not influence the relationship between ease of use and adoption intention of mobile banking. Nevertheless, in the specific context of applications, individuals with higher masculine levels might be more concerned with the complexity of use due to the care needed when conducting financial transactions. In addition, masculinity moderated the relationship between perceived financial cost ($\beta = .106$, $p = .019$) and adoption intention, such that with high masculinity, individuals become more concerned with potential costs of the service when considering adoption. Although most banking apps are free of use, participants with higher masculinity levels might be more sensitive to any cost they might encounter as they are considered the bread winners of the family compared to participants with higher feminine values.

Moderation effects on the relationship between social influences ($p = .116$), facilitating conditions ($p = .654$), initial trust ($p = .698$), disposition to trust ($p = .625$), perceived risk ($p = .464$) and

behavioural intention were not significant among all participants. Consequently, **H3a**, **H4a** and **H5a** are not confirmed. The results may be attributed to the low espoused masculinity levels in both countries (mean level of masculinity was 1.88 in Austria and 2.62 in Romania on a scale from 1 to 6). In addition, public opinion on traditional gender roles has very likely changed over the years with constant debates on the importance of promoting females in leadership positions. Consequently, it is reasonable to believe that masculinity may not influence very much technology adoption, since in both Austrian and Romanian societies gender equality has become an important topic of debate.

For Austrian participants, the espoused masculinity did not moderate the relationship between performance expectancy ($p = .346$), effort expectancy ($p = .234$), facilitating conditions ($p = .261$), initial trust ($p = .638$) and perceived risk ($p = .657$) and behavioural intention. Masculinity was found to marginally moderate the relationship between social influences and mobile banking apps acceptance, such that higher espoused masculinity increases the strength of the relationship ($\beta = .105$, $p = .091$). Although the result contradicts the hypothesized moderation effect, Zhang et al. [20] reported a similar finding. The authors argue that environmental uncertainty leaves individuals striving for success no other choice but consider recommendations from peers. In addition, the espoused masculinity values of Austrian participants are very low, as above mentioned, and the moderation effect was only significant at the 10% level. Consequently, the results could be different with larger sample sizes, as in the works of Tarhini et al. [25] and Srite and Karahanna [18]. The additionally tested moderation effects on the relationships between perceived financial cost ($p = .918$), disposition to trust ($p = .859$) and behavioural intention were not significant.

In the moderated multiple regression analysis of Romanian respondents, espoused masculinity significantly moderated the effect of performance expectancy on adoption intention ($\beta = -.219$, $p = .007$), such that this relationship was weaker for individuals with high masculinity values. Masculinity did not moderate the relationships between effort expectancy ($p = .818$), social influences ($p = .767$), initial trust ($p = .621$), perceived risk ($p = .310$). In addition, espoused masculinity was tested for the relationships between facilitating conditions, perceived financial cost and disposition to trust and adoption intention. It was found that individuals with high espoused masculinity would be more concerned with potential costs from the service compared to individuals with more feminine values. The moderating effect on facilitating conditions, disposition to trust and behavioural intention were insignificant.

Apart from the moderation effects, a direct effect of masculinity on adoption intention was tested, however no significant influence was found neither for the entire sample, nor among the Austrian or Romanian participants. Therefore, the adoption intention does not appear to be vary across gender inequality perceptions.

5.2.2 Individualism and Collectivism

Among the overall sample, espoused individualism was found to negatively moderate the relationship between effort expectancy ($\beta = -.125$, $p = .011$) and adoption of mobile banking applications. Participants exerting high levels of individualism were less concerned with the ease of use of the applications in their adoption intention compared to individuals with more collectivistic values. Hence, **H2b** could not be confirmed, as it stated the opposite effect. This finding contradicts the findings from Zhang et al. [20]. One explanation may be the low levels of individualism exerted by the participants (mean level of individualism was 3.25 in Austria and 2.74 in Romania). In addition, it was expected that people with high individualism levels would bear the risks of their choices and not adopt a technology which is difficult to use due to lack of help from the social environment. Nevertheless, it is highly likely that most participants had previous experience with applications and, therefore, unlikely they would find the service difficult to use.

Moreover, espoused individualism positively moderated the relationship between disposition to trust and adoption intention ($\beta = .143$, $p = .000$), such that the relationship was stronger for individuals espousing high levels of individualism. According to Tan and Sutherland [35], individualistic societies have higher disposition to trust compared to collectivistic societies, in which individuals tend to trust ingroup members. Hence, the higher disposition of individualistic participants may give rise to trust toward technologies.

Moderation effects of the relationships between performance expectancy ($p = .605$), social influences ($p = .183$), facilitating conditions ($p = .779$), perceived financial cost ($p = .203$), initial trust ($p = .437$), perceived risk ($p = .103$) were not statistically significant. Hence, **H1b**, **H3b**, **H4b** and **H5b** could not be confirmed among the entire sample. The insignificant moderation effect between initial trust and adoption intention is consistent with research from Zhang et al. [20].

The moderation effects of espoused individualism on the relationships between performance expectancy ($p = .772$), social influence ($p = .561$), initial trust ($p = .429$), perceived risk ($p = .243$) and behavioural intention were not significant for Austrian participants. Individualism moderated the relationship between effort expectancy ($\beta = -.177$, $p = .018$) and adoption intention, such that higher espoused individualism decreased the strength of the relationship. The additionally tested moderation effects of facilitating conditions ($p = .339$), perceived financial cost ($p = .750$) and disposition to trust ($p = .199$) were not significant.

For participants in Romania, individualism did not moderate the relationships between performance expectancy ($p = .106$), social influence ($p = .201$), initial trust ($p = .602$) and behavioural intention. Espoused individualism was reported to moderate the relationships between effort expectancy ($\beta = -.225$, $p = .021$) and adoption intention of mobile banking applications. Romanian participants exerting high levels of individualism were less influenced by the ease of use of the service compared to participants with more collectivistic values. The significant moderation effect between perceived risk and behavioural intention perceived risk ($\beta = -.234$, $p = .022$) does not support previous findings of Zhang et al. [20], who reported a positive moderation effect. As previously mentioned, in the context of mobile applications, individuals may be more wary of potential risks compared to the internet banking. The additionally tested moderation effects of facilitating conditions ($p = .961$), perceived financial cost ($p = .474$), disposition to trust ($p = .925$) and adoption intention were not significant.

For the entire and Austrian sample, the effect of individualism on the behavioural intention was not significant ($p = .461$). However, espoused individualism positively influenced behavioural intention of Romanian participants ($\beta = 1.284$, $p = .010$). Romanian individuals with high espoused individualism would be more like to adopt mobile banking applications compared to individuals with more collectivistic values.

5.2.3 Power Distance

Among the entire sample, the espoused power distance moderated the relationship between performance expectancy ($\beta = .125$, $p = .039$) and adoption intention of mobile banking applications. For participants with high espoused power distance, the performance expected from technology seems to be more important compared to individuals with low power distance. Consequently, **H1c** could not be confirmed, as the relationship between performance and behavioural intention was hypothesized to be weaker for such individuals. Even though the result differs from earlier findings of Zhang et al. [20] on Internet and mobile banking, and Tarhini et al. [25] on e-learning, the power distance mean levels of Austrian and Romanian participants are very low (mean level was 2.65 in Austria and 2.42 in Romania). In addition, mobile banking applications may impose higher risk for individual compared to electronic learning, such that they would be more interested in high performance as a mean to reduce uncertainty. The lack of moderation of the remaining relationships suggests that the effect of technology acceptance factors on adoption intention does not vary across power distance levels. The relationships between effort expectancy ($p = .664$), social influence ($p = .465$), facilitating conditions ($p = .159$), perceived financial cost ($p = .106$), initial trust ($p = .941$), disposition to trust ($p = .326$), perceived risk ($p = .169$) and adoption intention were not significantly moderated by power distance and could, therefore, not confirm **H2c**, **H3c**, **H4c** and **H5c**.

Moderation effects among Austrian participants of espoused power distance were found to be insignificant for all tested relationships. Considering that mobile banking applications are a voluntary technology and individuals do not necessarily have to adopt but can still use the antecedent service, online banking, variations in power distance levels may not influence the contribution of technology factors to the intention to use the service. In addition, Austrians exert lower power distance levels compared to Romanians, meaning that individuals are guided by more egalitarian principles [16].

For participants in Romania, power distance moderated the relationships between perceived risk ($\beta = .324$, $p = .033$) and behavioural intention to adopt mobile banking applications, such that for individuals with high espoused power distance, the perceived risk of using the technology was more important than for participants with lower power distance. Taking into account that online banking adoption of Romanians is much lower than of Austrians, they may be more wary of potential risks involved and prefer the interaction with bank personnel than adopting a self-service system. In addition, power distance was found to positively influence the effect of disposition to trust on adoption intention, such that the relationship is stronger for participants with high power distance values. The moderation effects for the relationships between performance expectancy ($p = .121$), effort expectancy ($p = .870$), social influence ($p = .534$), facilitating conditions ($p = .286$), perceived financial cost ($p = .215$), initial trust ($p = .514$) and adoption intention could not be confirmed.

Considering the direct impact on adoption intention, it was found that the espoused power distance significantly influenced adoption intention of mobile banking applications among all participants, such that participants exerting high levels of power distance were less likely to adopt mobile banking applications. A similar negative effect was found for the Romanian participants. This contradicts previous results of Picoto and Pinto [21] who found that power distance positively impacted the relation between the intention and actual use of mobile banking but provides support for the results of Khan [22] who reported that power distance negatively moderated the relationship between intention and usage for Pakistani sample.

5.2.4 Uncertainty Avoidance

Similar to espoused power distance, uncertainty avoidance was a weak moderator among the entire sample. It was found that for participants with high levels of uncertainty avoidance, the relationship between perceived risk and behavioural intention was weaker ($\beta = -.122$, $p = .084$). The result confirms **H5d**. Although the meta-analysis of Zhang et al. [20] could not confirm this finding, it seems reasonable to assume that individuals who are very sensitive toward uncertainty would be more concerned with potential risks and more likely to reject mobile banking applications. The remaining relationships were not significantly moderated by uncertainty avoidance. Consequently, **H1d**, **H2d**, **H3d**, **H4d** could not be confirmed among the entire sample. This suggests that the contribution of technology factors to the adoption intention did not vary across uncertainty avoidance levels. The results contradict previous research [20, 25, 34], which found significant moderation effects of uncertainty avoidance on the relationships between perceived usefulness, social influences, trust, and purchase or use intention. However, Zhang et al. [20] did not measure culture directly, whereas Zhou et al. [34] focused on online shopping, which may imply more uncertainty due to buyers' higher responsibility compared to mobile banking applications, in which most errors are covered by banks.

For Austrians, espoused uncertainty avoidance did not moderate the relationship between performance expectancy ($p = .452$), effort expectancy ($p = .193$), social influence ($p = .765$), facilitating condition ($p = .304$), perceived financial cost ($p = .727$), initial trust ($p = .952$), disposition to trust ($p = .109$) and behavioural intention. The uncertainty avoidance was found to moderate the relationships between perceived risk ($\beta = .255$, $p = .033$), such the relationship is weaker for individuals with high espoused uncertainty avoidance.

Among Romanian participants, the espoused uncertainty avoidance did not moderate any of the relationships between technology acceptance factors and adoption intention. There are several possible explanations for the lack of significance. Moderation effects of uncertainty avoidance may be attributed to the stage of adoption. In case of adoption and actual use of mobile banking applications, individuals may perceive differently the features and potential risks. Furthermore, banks offer detailed explanations of the features of applications on their local website and individuals know from previous experience with other applications what to expect from the service. In addition, the result may be attributed to the variable measurement, as only two items were considered to measure the uncertainty avoidance of participants, and they referred to the importance of structure and order in a work environment.

For the entire sample, the espoused uncertainty avoidance was no significant predictor of mobile banking apps acceptance ($p = .274$). In Romania, similar results were found, however, among Austrian participants, the uncertainty avoidance positively influenced behavioural intention ($\beta = 1.776$, $p = .005$).

This section has highlighted the results of the moderated multiple regression analysis, highlighted in Figure 3 across the entire sample. The next section of this paper will discuss the limitations of this research and recommendations for potential future studies.

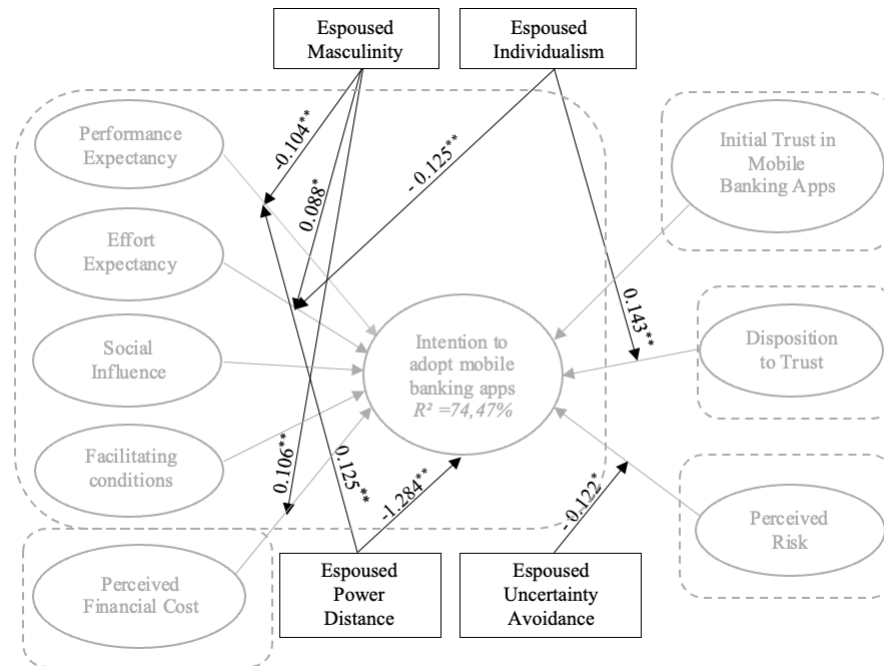


Figure 3: Results of moderated multiple regression among all participants (n = 425)

*p < 0.10, **p < 0.05, ***p < 0.01

5.3 Limitations and Implication for Future Research

To assess the results for the Austrian and Romanian participants, this work used nationality as a proxy for culture. Considering the high migration in Austria over the last decades, it is expected that some of the participants were not born in Austria but acquired the citizenship due to fulfilling the residency requirements. Future research could consider selecting participants based on primary language spoken, country of origin or years lived in the country. The generalizability of results might further be limited by the sample composition, as most respondents were between 30 and 40 years, highly educated and living in Maramures and Vienna. In terms of occupation, most participants were students or employed. These groups might be more interested in adopting mobile banking applications. Future research should consider conducting the research with a more heterogenous sample. In addition, this work is restricted by the analysis on non-user behavior. The hypothetical nature of the statements may limit the generalizability of results, as individuals were required to imagine themselves in the situation where they would use a mobile banking application. However, one requirement for the participation was the possession of a smartphone, on which applications can be installed. Consequently, all subjects should have been able to assess the benefits and disadvantages of a new service. Future studies could consider conducting a comparison between users and non-users.

Another limitation could be the focus on Austria and Romania. Future research could try to validate the moderation effects in other countries and consider differences between rural and urban areas [36]. In addition, this paper considered eight technology acceptance factors. However, newer research highlighted the importance of additional factors in the adoption intention of mobile banking, such as electronic word of mouth [37], artifacts of artificial intelligence [38], cashless payments [39], or enjoyment in the case of mobile payments [40]. Future studies could investigate these factors.

Despite the previously mentioned limitations, this paper adds to the currently limited body of research on mobile banking acceptance in Austria and Romania and has implications for international

banks marketing strategies. From a research perspective, this study highlighted the importance of direct culture measurement. The cultural dimension, masculinity, at the individual level of analysis differed from the cultural values at the national level, as appointed by Hofstede [16]. Consequently, future studies should consider measuring culture directly instead of adopting the country scores. By contrast, espoused uncertainty avoidance, power distance and individualisms levels were comparable with those proposed by Hofstede [16], providing support for the appointed country scores from 40 years ago. In addition, this work has evidenced the significant contribution of espoused individualism to the disposition to trust effect on mobile banking adoption and the significant moderating effect espoused masculinity on the relation between perceived financial cost and adoption intention, relationships which the research so far has scarcely addressed.

From a practice perspective, the present study raised awareness about different technology acceptance factors of individuals based on individual cultural values compared to aggregated behaviours. Whilst banks have limited possibilities to measure the espoused cultural values of their customers, the results of this research emphasize the need to be aware that these types of differences exist. As high levels of espoused power distance negatively predicted adoption, banks could try to emphasize less authority in their marketing strategies and more egalitarian values with their customers.

6. Conclusion

This paper investigated the moderation effects of culture on the relationships between technology acceptance factors and adoption intention of mobile banking applications in Austria and Romania. Compared to previous research which analysed cultural effects by adopting the country scores from Hofstede, this work looked at cultural effects at the individual level of analysis. Among all participants, it was found that individuals with higher masculinity levels were less concerned with performance in the decision to adopt mobile banking applications and more interested in the ease of use and perceived financial cost compared to participants with more feminine values. High levels of individualism of participants were found to negatively influence the relationship between effort expectancy and decision to adopt mobile banking services, while positively impacting the relationship between disposition to trust and adoption intention. For individuals with higher power distance levels, the relation between the performance expectancy and intention to use mobile banking was found to be stronger. In addition, a significant negative effect of espoused power distance on behavioural intention was evidenced, which means that individuals who are more comfortable experiencing inequality are less likely to adopt mobile banking applications. Overall, espoused masculinity was found to be the strongest moderator among all participants. Although the measurement of espoused cultural values may be difficult to implement in practice, this work provided evidence that cultural values at the individual level of analysis can influence the relationship between technology acceptance factors and adoption intention of mobile banking applications.

7. References

- [1] J. Choudrie, C.-O. Junior, B. McKenna, S. Richter, Understanding and conceptualising the adoption, use and diffusion of mobile banking in older adults: A research agenda and conceptual framework, *Journal of Business Research* 88 (2018). doi: 10.1016/j.jbusres.2017.11.029.
- [2] ING, Drei von vier Österreichern setzen auf Mobile Banking. Pressemitteilung, 2019. URL: https://www.ing.at/fileadmin/uploads/media/kommunikation/pressemeldungen/2019/PI_New_Banking/PI_New_Banking.pdf.
- [3] Inoxoft, What is Mobile Banking? Advantages and Disadvantages of Mobile Banking, 2022. URL: <https://inoxoft.com/blog/what-is-mobile-banking-advantages-and-disadvantages-of-mobile-banking/>.
- [4] DBS, Advantages & Disadvantages of Mobile Banking | DBS Bank, 2022. URL: <https://www.dbs.com/digibank/in/articles/save/advantages-and-disadvantages-of-mobile-banking>.

- [5] Deloitte, Digital Banking Maturity 2022, 2022. URL: https://www2.deloitte.com/content/dam/Deloitte/xs/Documents/technology/me_digital-banking-maturity-2022.pdf.
- [6] Identity Guard, The Risks of Mobile Banking Apps: Keep Your Money Safe, 2023. URL: <https://www.identityguard.com/news/risks-of-using-mobile-banking-apps>.
- [7] Eurostat, E-banking and e-commerce, 2023. URL: https://ec.europa.eu/eurostat/databrowser/view/ISOC_BDE15CBC/default/table?lang=en.
- [8] Statista, Market Insight | Banking | Global Indicators, 2023. URL: <https://www.statista.com/outlook/co/digital-connectivity-indicators/banking/austria>.
- [9] European Banking Federation (EBF), Banking in Europe: EBF Facts & Figures 2022 – 2021 banking statistics, 2022. URL: <https://www.ebf.eu/wp-content/uploads/2022/12/Banking-in-Europe-EBF-Facts-and-Figures-2022.-FINAL.pdf>.
- [10] European Commission, Flash Eurobarometer 525 Monitoring the level of financial literacy in the EU, 2023. URL: <https://europa.eu/eurobarometer/surveys/detail/2953>.
- [11] United Nations, World Economic Situation and Prospects (WESP), 2022. URL: <https://www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-2022/>.
- [12] I. Ajzen, The theory of planned behavior, *Organizational Behavior and Human Decision Processes* 50(2) (1991) 179–211. doi: 10.1016/0749-5978(91)90020-T.
- [13] M. Fishbein, I. Ajzen, *Belief, attitude, intention and behavior: An introduction to theory and research*, Addison-Wesley, Reading, MA, 1975.
- [14] F. D. Davis, Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly* 13(3) (1989) 319–340. doi: 10.2307/249008.
- [15] V. Venkatesh, M. G. Morris, G. B. Davis, F. Davis, User Acceptance of Information Technology: Toward a Unified View, *MIS Quarterly* 27(3) (2003) 425–478. doi: 10.2307/30036540.
- [16] G. Hofstede, *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*, 2nd. ed., SAGE Publications, Thousand Oaks, CA, 2001.
- [17] S. McCoy, D. F. Galletta, W. R. King, Integrating National Culture into IS Research: The Need for Current Individual Level Measures, *Communications of the Association for Information Systems* 15(1) (2005) 211–224. doi: 10.17705/1CAIS.01512.
- [18] M. Srite, E. Karahanna, The Role of Espoused National Cultural Values in Technology Acceptance, *MIS Quarterly* 30(3) (2006) 679–704. doi: 10.2307/25148745.
- [19] C. Tam, T. Oliveira, Does culture influence m-banking use and individual performance?, *Information & Management* 56(3) (2019) 356–363. doi: 10.1016/j.im.2018.07.009.
- [20] Y. Zhang, Q. Weng, N. Zhu, The relationships between electronic banking adoption and its antecedents: A meta-analytic study of the role of national culture, *International Journal of Information Management* 40 (2018) 76–87. doi: 10.1016/j.ijinfomgt.2018.01.015.
- [21] W. N. Picoto, I. Pinto, Cultural impact on mobile banking use – A multi-method approach, *Journal of Business Research* 124 (2021) 620–628. doi: 10.1016/j.jbusres.2020.10.024.
- [22] I. U. Khan, How does culture influence digital banking? A comparative study based on the unified model, *Technology in Society* 68 (2022). doi: 10.1016/j.techsoc.2021.101822.
- [23] N. Souiden, R. Ladhari, W. Chaouali, Mobile banking adoption: a systematic review, *International Journal of Bank Marketing* 39(2) (2021) 214–241. doi: 10.1108/IJBM-04-2020-0182.
- [24] C. Yoon, The effects of national culture values on consumer acceptance of e-commerce: Online shoppers in China, *Information & Management* 46(5) (2009) 294–301. doi: 10.1016/j.im.2009.06.001.
- [25] A. Tarhini, K. Hone, X. Liu, T. Tarhini, Examining the moderating effect of individual-level cultural values on users' acceptance of E-learning in developing countries: a structural equation modeling of an extended technology acceptance model, *Interactive Learning Environments* 25(3) (2017) 306–328. doi: 10.1080/10494820.2015.1122635.
- [26] H. Hallikainen, T. Laukkanen, National culture and consumer trust in e-commerce, *International Journal of Information Management* 38(1) (2018) 99. doi: 10.1016/j.ijinfomgt.2017.07.002.
- [27] K. Meier-Pesti, E. Penz, Sex or gender? Expanding the sex-based view by introducing masculinity and femininity as predictors of financial risk taking, *Journal of Economic Psychology* 29(2) (2008) 180–196. doi: 10.1016/j.joep.2007.05.002.

- [28] H. Sun, P. Zhang, The role of moderating factors in user technology acceptance, *International Journal of Human-Computer Studies* 64(2) (2006) 53–78. doi: 10.1016/j.ijhcs.2005.04.013.
- [29] P. A. Pavlou, L. Chai, What drives electronic commerce across cultures? A cross-cultural empirical investigation of the theory of planned behaviour, *Journal of Electronic Commerce Research* 3(4) (2002) 240–253.
- [30] S.-G. Lee, S. Trimi, C. Kim, The impact of cultural differences on technology adoption, *Journal of World Business* 48(1) (2013) 20–29. doi: 10.1016/j.jwb.2012.06.003.
- [31] G. Hofstede, G. J. Hofstede, M. Minkov, More Equal Than Others, in: G. Hofstede, G. J. Hofstede, M. Minkov (Ed.), *Cultures and Organizations: Software of the Mind. Intercultural Cooperation and Its Importance for Survival*, 3rd. ed., McGraw-Hill, New York, 2010, pp. 53–88.
- [32] M. A. Daniels, G. J. Greguras, Exploring the Nature of Power Distance: Implications for Micro- and Macro-Level Theories, Processes, and Outcomes, *Journal of Management* 40(5) (2014) 1202–1229. doi: 10.1177/01492063145271.
- [33] N. Dawar, P. M. Parker, L. J. Price, A Cross-Cultural Study of Interpersonal Information Exchange, *Journal of International Business Studies* 27(3) (1996) 497–516. doi: 10.1057/palgrave.jibs.8490142.
- [34] T. Zhou, Y. Lu, B. Wang, Examining online consumers' initial trust building from an elaboration likelihood model perspective, *Information Systems Frontiers* 18(2) (2016) 265–275. doi: 10.1007/s10796-014-9530-5.
- [35] F. B. Tan, P. Sutherland, Online Consumer Trust: A Multi-dimensional Model, *Journal of Electronic Commerce in Organizations* 2(3) (2004) 40–58. doi:10.4018/jeco.2004070103.
- [36] T. Oliveira, M. Faria, M. A. Thomas, A. Popovič, Extending the understanding of mobile banking adoption: When UTAUT meets TTF and ITM, *International Journal of Information Management* 34(5) (2014) 689–703. doi: 10.1016/j.ijinfomgt.2014.06.004.
- [37] A. Shankara, C. Jebarajakirthyb and Md Ashaduzzaman, How do electronic word of mouth practices contribute to mobile banking adoption?, *Journal of Retailing and Consumer Services* 52 (2020). doi: 10.1016/j.jretconser.2019.101920.
- [38] J.-C. Lee, X. Chen, Exploring users' adoption intentions in the evolution of artificial intelligence mobile banking applications: the intelligent and anthropomorphic perspectives, *International Journal of Bank Marketing* 40(4) (2022) 631–658. doi: 10.1108/IJBM-08-2021-0394.
- [39] H.-B. Ong and L.-L Chong, The effect of cashless payments on the internet and mobile banking, *Journal of Financial Services Marketing* 28 (2023) 178–188. doi: 10.1057/s41264-022-00145-0.
- [40] P. Reiting, A. Mladenow, C. Strauss, G. Kotsis, Mobile Payment: Classic Approaches to Promote Consumer Adoption, in: *Proceedings of the 18th International Conference on Advances in Mobile Computing & Multimedia*, Association for Computing Machinery, New York, NY, 2020, pp. 84–93. doi:10.1145/3428690.3429182.