The role of generational cohorts in mobile banking adoption: evidence from South-Eastern Europe

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Abstract

The extended unified theory of acceptance and use of technology (UTAUT2) model extensively explains consumers' behaviour. However, from the service providers' perspective, understanding the role of generational cohorts in technology acceptance is necessary. The paper explores this role in mobile banking adoption by investigating its moderating effect on the linkages between the antecedents of the UTAUT2 model and behavioural intention. The article uses the partial least square method and regressions with generation as a multi-categorical moderator to investigate the moderating effect in a sample of 959 individuals from South-Eastern Europe. Findings reveal that generations govern most of the linkages between the antecedents of UTAUT2 and behavioural intention. These relationships were stronger for generation Y than generation Z, while there were no differences between generation X and Y. The paper contributes to the literature by providing theoretical and practical insights in the context of developing countries.

Keywords: Mobile banking, generation X, generation Y, generation Z, UTAUT2, effort expectancy, social influence, facilitating conditions, habit, hedonic motivation, behavioural intention, Albania, Croatia, North Macedonia, Serbia

1 Introduction

Today, technology is a vital factor in improving the quality of life. The invention of technology in vast areas of life has affected it radically, made it easy, more comfortable, and enjoyable (Atkinson and Castro, 2011). The advent of the internet and mobile devices has drastically changed the lives of individuals around the globe, affecting their lifestyle, habits, preferences, and even their day-to-day

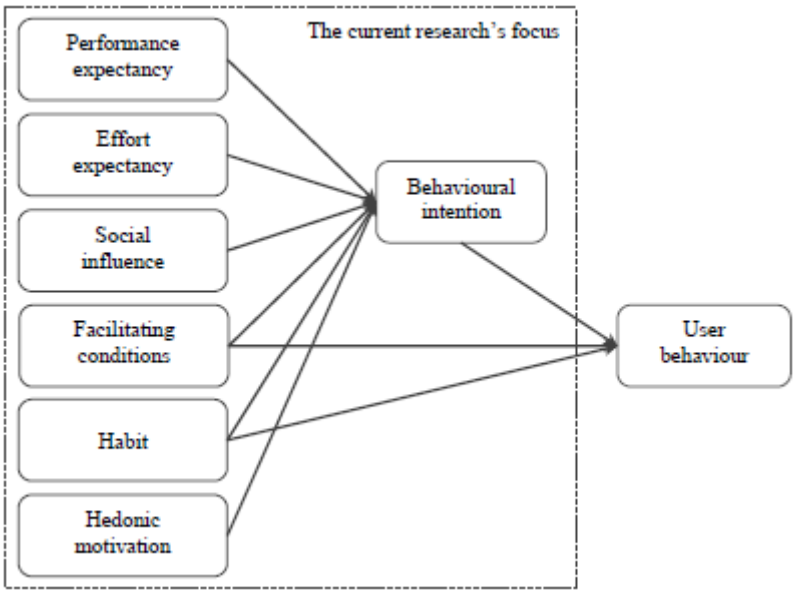
decision-making (**Sarwar and Soomro, 2013**). It is the part of life now, internet and mobile are no more an invention itself, as it helps to invent and innovate other things which can make life easy, cheaper, and faster. These advents accelerated its presence among other fields like shopping, learning, banking, and so forth. Mobile banking signifies as one of the phenomenal breakthroughs in electronic banking (**Bidarra et al., 2013**). The constant technology development and research tirelessly identify the scope for further growth and development, help interact with challenges, and match the problem with the solution. One of the fastest spreading and valuable technology in the current scenario is mobile banking. This paper is about people, their generations, and mobile banking usage. The concept of the generational cohort is rooted in the age-time specification, time, and age that differentiate one generation from others (**Ryder, 1965**). Age is a significant factor that differentiates one group of people from another, one generation from others. All the efforts behind this paper are to find what lies between different generational cohorts, how generational cohort can be a better way to understand individuals' behaviour, and the individuals' intentions towards mobile banking adoption and acceptance, and that is the premeditated aim of the paper to examine. This is an exclusive and comprehensive study through the antecedents of the unified theory of acceptance and use of technology (UTAUT2) (Venkatesh et al., 2012) with a focused objective to determine the individuals' intentions in mobile banking usage and to investigate the role of generational cohorts in mobile banking usage.

Constant technological advancements had led to the development of mobile communications since its inception a few decades ago. Information technologies platforms, communication devices, and financial applications all together empower users to make recurring payments and execute banking transactions without visiting bank branches in person. Today, the mobile phone is an essential part of life. It is widely used for various reasons, such as marketing communications (**Öztaş, 2015**), shopping (**Pantano** and **Priporas, 2016**), banking, and financial services (**Laukkanen** and **Pasanen, 2008**), teaching and learning (**Ashour et al., 2012**). Different service providers use mobile marketing to reach consumers and satisfy them with their flawless services using advanced technological innovations (**Öztaş**, **2015**). Among many applications, mobile banking is one of the major financial applications that users prefer to use banking services, make payments, and commerce (**Pal et al., 2020**). Mobile banking services gives freedom and empowerment to users to make payment from anywhere at any time, with least effort, trusted security, and easiness, which are the critical factors for its acceptance and same are the driving forces behind the growth of mobile banking transactions among people around the world (**Mallat et al., 2004**). Though the acceptance of mobile banking is increasing, some studies reveal that mobile banking is still limited and requires more focus (**Changchit et al., 2018; Siyal et al., 2019**).

The study has focused on generational cohorts because of ambiguity detected in previous studies, which covered age as a demography factor to understand individuals' intentions to use mobile banking. An exciting investigation mentioned that each generational cohort behaves differently and has different viewpoints and likings (**Twenge and Campbell, 2008**). It gives a direction to the present study. Further investigation supports this and mentions that people born in different generations witnessed different inventions and were brought up in different conditions (**Ryder, 1965**). Some generations are born through technology support and in an advanced technology environment. For the current generation of kids, the internet may not be an advanced invention, but it will always be an advanced invention for the aged. Considering these issues, various studies have investigated the factors that influence mobile banking adoption to support policymakers, service providers and help individuals to avail the benefits of convenient mobile banking services using several models and theories such as UTAUT (**Venkatesh et al., 2003**) and technology adoption model (**Davis, 1989**). Several studies in different locations with different demographics reveal that mobile banking still needs to spread, and its wide acceptance needs to be improved in urban and rural areas, and some studies found it is not as

widely accepted as it has to be. Many other studies also explored different demographic characteristics to determine mobile banking usages such as age, income, gender, and many more (**Alafeef et al., 2012; Qera et al., 2021; Chawla** and **Joshi, 2018; Porter et al., 2020; Venkatesh et al., 2012**).

The study focuses on South-Eastern European economics such as Croatia, Serbia, North Macedonia, and Albania, addressing the need for research explicitly focused on transition countries (**Roztocki** and **Weistroffer, 2015**). The study is expected a similar outcome as they share many similarities in their culture, economic stage of development, and institutional environment (**Vesnic-Alujevic, 2012**). Also, these nations have witnessed a drastic change in their political and economic structure, from the communist era to the free-market regime, and are trying hard to become part of the European Union except Croatia, which has already achieved it. To the best of the authors' knowledge, no study has covered these generational differences regarding intentions to use mobile banking, especially in the context of South-Eastern Europe. Several studies with different focuses can be found from the Western European countries, Middle East nations, etc. Therefore, this phenomenon and these states need more concentration from the researchers to improve mobile banking usage behaviour, which is the gap the study intends to addres



Source: Venkatesh et al. (2012)

Figure 1 The UTAUT2 model

This paper investigates the antecedents of individuals' intentions towards mobile banking usage with a specific and exclusive focus on age-related factors only. The study is designed in such a way to detect the differences between the homogenous group of people classified as generations X, Y, and Z, with an intention that the outcomes of the study might help the human resource managers, marketers, policymakers, service providers, and social organisation to understand their intentions towards mobile banking usage. It also portrays how generational cohort is a better variable than using age as a scale variable. The study's outcome can help the strategists to understand how age differences affect the antecedents of the UTATU2 model and provide the future research agenda to the research communities. According to this model, performance expectancy, effort expectancy, social influence, facilitating conditions, price value, habit, hedonic motivation predict behavioural intention (see **Figure 1**). The study attempted to find the answers to the following questions. Is it a myth or just a belief that the latest generation has more technology acceptance and use than the previous generations? Are

younger more inclined towards mobile banking usage? What is better to consider for study age or generational cohorts?

The flow of the paper is straight forward. A detailed literature review follows the introduction of the paper. The third and fourth parts of the paper cover data collection and methodological aspects, analysis, and results. The discussion of the findings is under the fifth part. The article ends with a conclusion along with limitations.

2 Literature review

The literature review is in three parts: first, it focused on generational cohorts, their classifications and characteristics, and how it could be a better way to study population than using age as a demographic factor. The application of the UTAUT2 model to measure usage intention through existing studies and then a justification through studies how different generational cohorts affect the antecedents of the UTAUT2 model regarding individuals' intention to use mobile banking. The theoretical support of the present study is based on the three standpoints: UTAUT2 (**Venkatesh et al., 2012**) and generational cohort theory (**Inglehart, 2015**), and mobile banking usage. **Venkatesh et al.** (**2003**) formulated the UTAUT2 model as a conceptual framework to investigate individuals' technology adoption. The generational cohort theory was framed in 1977 (**Inglehart, 2015**), which supports that the population can be clustered based on their birth years, as it was discovered that those that belong to a certain generational cohort demonstrate shared beliefs and attitudes (**Meriac et al., 2010**). Academicians have well-thought-out about segmenting the population by generation cohort, as it can be more efficient than grouping by age (**Lissitsa and Kol, 2016; Parment, 2013**) but still have limited presence in the literature compare to age measured as a scale variable.

On one side, there is a constant change in the information and communication technologies (ICTs), and, on the other side, it is the generational cohorts that reflect differences between the groups of individuals divided based on age. Since its inception, mobile banking has continuously growth, and it has dramatically changed the ways financial services are transacting, and it is imperative for service providers to know the behaviour of users (**Bhatiasevi, 2016**). The question to resolve is how it can be accelerated, therefore, to find how and which generation has the significant inclination towards mobile banking usage and acceptance. Hence it needs a comprehensive study that can exclusively cover how the age factor can affect the antecedents of the intentions towards mobile banking usage but as a generational cohort. Directly or indirectly, marketers target their products at least to one or all segments to position their products. It is relevant for every marketer, policymaker, service provider, and social organisation to understand which factors affect them the most, especially their usage and intentions to use. Today, the biggest challenges for companies are product segmenting, targeting, and positioning to reach the right consumers in the right segment (**Tripathi, 2018**). Therefore, it is worth knowing the role of age differences, more appropriately generational differences. To understand how generational cohort can be a better way to understand users, the study further looks into ambiguities in the previous studies to establish its arguments and give suggestions for improvement.

Looking into the generational classifications, the first two generations were classified as traditionalists and baby boomers who hold a smaller percentage of the present society, and a tiny percentage is in the current workforces. But, the major segments of the current society/population consist of generations X, Y, and Z. These three generations are the primary users of current ICTs. They are the target consumer for companies and business houses. Each cohort behaves differently and has different lookouts and preferences (**Twenge** and **Campbell**, **2008**). **Ryder** (**1965**) mentioned that the generational cohort is entrenched in the age-time specification.

Further added, the generational cohort is the group of collective individuals who faced the same incidents within the same passage of time. Therefore because of the same atmosphere and experiences, they develop identical and similar behaviour, which helps to identify one from other generations. Cohorts are distinguished because of the varying content of formal education, by peer-group socialisation, and distinctive experience. Looking into the features of different generations, it can easily be pointed out that why age is a crucial demographic factor need to be studied. Generation X, born between 1960 and 1980, started seeing the modern way of living, maintaining a balance between work-life, having time for social events and better entrepreneurial aptitude than previous generations, and zeal to excel and value their relationship. Then came generation Y, born between 1980 to 1995, are the ones who witnessed the beginning of globalisation and involved themselves from the beginning of the era of globalisation, open for new challenges and opportunities, focused on education and development, and technology adoption and acceptance. Generation Z, individuals born after 1995, are surrounded by ICT innovations, have high levels of digital literacy and the aptitude to adapt swiftly to new technologies, which empowers them to function efficiently. For them, the internet and mobile is an existing technology, and they do not see them as a major innovation of their age (**Bejtkovsky, 2016; Jiří, 2016**).

Many studies, which have included age as a moderator, detected significant findings. For example, **Chawla** and **Joshi** (**2018**) divided the people based on age into two groups below 30 years and above 30 years. Similarly, **Baptista** and **Oliveira** (**2017**) also considered the sample consisting of 55% individuals between 35 to 55 years old in their research. Observing these age divisions, it is unclear to differentiate between young and old precisely. Generations Y or Z, based on the outcomes of the studies, it may be better to classify and study the population into generational cohorts to understand their unique behaviour. Minimal studies have covered generational differences as direct measures using the UTAUT2 model (**Venkatesh et al., 2012**). Furthermore, a study found that individuals between 25 to 29 and 30 to 39 years old have a higher chance of influencing mobile banking usage amongst e-banking users than individuals between 18-24 years (**Laukkanen** and **Pasanen**, **2008**). It was also stated that the typical users of mobile banking are older age group, not younger between 18 to 24 years old. Seeing it from generational cohorts' angle, this older age group falls within the age range of generation Y, and younger adults fall within generation Z, born after 1995 and are under 25 years of age. It has also been detected that mobile banking users between 30 to 49 years old are also higher than young mobile banking users. Another study showed that facilitating conditions, perceived complexity, awareness-knowledge, perceived ease of use, and age do not significantly impact individuals' behavioural intention to accept and adopt mobile banking, based on the sample consisting of 84% of individuals between 21 to 40 years (**Makanyeza, 2017**). It means again the majority belongs to generation Y and do not give a clear difference between the new and old generation. Besides, **Suoranta** (**2003**) also found that individuals between 25-34 years old are the typical mobile banking user. Again, if it classifies into generational cohorts, it reflects that generation Y has more inclination towards mobile banking usage. Considering the outcomes of the discussed studies, scholars reflect no clear basis of demarcation between old and young groups, as they group individuals as per their sample and convenience. To avoid this ambiguity, generational cohorts can be a better option than age to understand the people's behaviour, which can help the researchers to bring more clarity in their results. This argument, even supported by **Parment** (**2013**), it is better to segment the population into generational cohorts instead of making age group, which is proofed to be more efficient way, as it reflects typical behaviour of individuals being born in the similar environment and share common features used in research to bring out more clarity in their findings (**Lissitsa** and **Kol**, **2016**).

The study has adopted the antecedents from the UTAUT (**Venkatesh et al., 2003**), which is presently the most widely acknowledged theory to study the acceptance of mobile banking. This model has wide

acceptance and has gained considerable importance from researchers around the globe (**Alalwan et al., 2015; Baabdullah et al., 2019; Baptista** and **Oliveira**, **2015; Park et al., 2007**) to examine the age factor which influences the user's behaviour intention and usage behaviour.

Age can play an essential role in the issues affecting mobile banking adoption (**Boonsiritomachai** and **Pitchayadejanant**, **2017**). **Harris et al.** (**2016**) claim that, while people of all ages now share the same interest in evolving online technologies, in contrast, still older customers reflect higher value in traditional banking and young shows higher attraction towards latest technologies. Venkatesh et al. (2012) also stated that age reflects variances towards information processing. According to Lee and Coughlin (2015), a number of factors that affects the older adult's decisions regarding ICT adoption, such as value assessment, past experiences, matching with lifestyles, and affordability. Even perceived importance and effects of different adoption factors, including technology type, were found different between generations. The majority of studies have shown that individuals in the age group of 20-35 years old tend to have larger exposure towards technology, and a higher tendency to adopt and try new technologies (Chen et al., 2007). Studies related to mobile services also indicate significant variances between different age clusters regarding attitudes towards mobile services (**Koivumaki, 2002**). Perhaps age is one of the most commonly used demographic indicators in analysing disparities in the adoption of mobile end-user services (**Koivumaki et al., 2006**). Generational differences appeared as a vital factor regarding technology use. Mobile phones and websites are less user-friendly to older people than the middle-aged individuals and young individuals. The study detected there is a digital divide between seniors' individuals and younger individuals and also individual training regarding technology usage might have increased the usage (**Van Volkom et al., 2014**). A study by **Czaja et al.** (**2006**) stated that older adults were less likely to use the internet, computers, and the World Wide Web in general than younger adults.

Few evidence also detected that generation Y uses I-banking often and uses online products (**Heaney, 2007**). Another study found that compatibility, perceived usefulness, and self-efficacy are considerably and positively influence users' intention to accept the services in both generations. Amazingly, social influence has significantly impacted the adoption of mobile banking only in Gen Z (**Ruangkanjanases** and **Wongprasopchai, 2017**). The hedonic motivation of m-banking users was recognised as the most imperative factor motivating customers to adopt mobile banking. These results are useful for banking organisations to frame strategies and to advance their services to increase the acceptance of mobile banking among generation Y (**Boonsiritomachai** and **Pitchayadejanant, 2017**). Generation X and Y indicate the prospect of financial services consumption (**Constantine, 2010**). A motivating result was found by **Ali** and **Maideen** (**2019**) stated that the generation Y shows higher behavioural intention to accept the mobile crowdsourcing app with greater higher social influence, perceived usefulness, and upper hedonic motivation than the younger generation Z. Another report regarding mobile banking usage shows that millennials are leading it. Among all age groups, they have the highest percentage who responded that they have participated in mobile banking activities and plan to use them in the future (**Nielsen Holdings, 2016**). Another study summarises and states that age affects all seven antecedents of the UTAUT2 model towards intention and usage, but its importance differ among different age groups such as effort expectancy, social influence, and facilitating conditions are stronger among older users, and performance expectancy is more substantial among young users (**Fuksa, 2013**). A study on generation Z showed that facilitation condition is the primary factor that affects the individuals' behaviour intention (**Persada et al., 2019**). The discussed literature fails to clearly reveal how each generation affects different elements of the UTAUT2 model towards individuals' intentions to mobile banking usage and found mixed results. Also, millennials have to involve themselves and learn technology usage as it is nearly impossible for them to work and excel without ICT knowledge and involvement in it and to take the advantage of convenient services like mobile banking. On the

other hand, there is a generation who are born in the era of ICT and start using mobile phone at a very early age. Therefore, it could be an interesting investigation to find, which generation has higher influence on the intentions to use mobile banking.

Based on the above discussion, the following hypotheses can be framed: generation cohorts moderate the influence of effort expectancy, performance expectancy, facilitating conditions, habit, hedonic motivation, social influence on intention to use mobile banking.

3 Methods and procedures

3.1 Questionnaire and variables

The unit of the analysis for this research is individuals from post-communist countries in the Western Balkan (Albania, Croatia, North Macedonia, and Serbia). A questionnaire was designed based on the literature review to investigate the moderating effects of generational cohorts of the relationships between the antecedents of UTAUT2 constructs and behavioural intention to use mobile banking. To proceed with the collecting data phase, its content was translated into the local languages. The UTAUT2 constructs were mainly adapted from **Venkatesh et al.** (**2003, 2012**). The level of agreement for indicator have been measured with a five-point Likert scale (1 = 'strongly disagree' to 5 = 'strongly agree'). More details on the variable scale can be found in Appendix. Moreover, the individuals were asked to write the year they were born. As explained by **Bejtkovsky** (**2016**), different classification for generation cohorts are used in the literature. For analysis purposes, following **Bejtkovsky's** (**2016**) classification, generation X were considered those who are born before 1985, generation Y respondents born between 1985 and 1996, and generation Z people born after 1996.

Table 1 Sample profile

		AL (n = 407)	*CR (n = 207)*	*NM (n = 166)*	*SR (n = 179)*	*Total (n = 959)*
Gender	Female	68.6%	63.8%	59.0%	69.3%	66.0%
	Male	31.4%	36.2%	41.0%	30.7%	34.0%
Living area	Rural area	15.7%	12.6%	32.50%	20.1%	18.8%
	Urban area	84.3%	87.4%	67.50%	79.9%	81.2%
Generational cohorts	Generation Z	46.2%	4.3%	7.80%	6.70%	23.1%
	Generation Y	47.2%	47.8%	28.90%	76.0%	49.5%
	Generation X	6.6%	47.8%	63.30%	17.3%	27.3%
Education	Up to high school	0.7%	1.5%	6.60%	0.0%	1.8%
	High school	15.2%	24.6%	31.30%	16.2%	20.2%
	Undergraduate	50.1%	19.8%	45.20%	55.3%	43.7%
	Postgraduate	33.9%	54.1%	16.90%	28.5%	34.3%

Note: AL, Albania; CR, Croatia; NM, North Macedonia; SR, Serbia.

As the research focuses on the individuals' behavioural intention to use mobile banking, the convenience sampling method was used to reach the respondents. The target population was individuals over 18 years of age who owned a mobile phone/tablet connected to the internet and had at least one bank accounts. A pilot study was first executed in each country (30-40 respondents), to

check the translation's accuracy and ensure consistency. The phase of the data collection took place in March-May 2019.

After adjustments and corrections, the final dataset consists of 959 valid respondents. Table 1 illustrates the sample profile of each country and all together.

3.2 Data analysis

The creation of the UTAUT2 constructs was achieved by using the partial least square of the structural equation modelling method. This method was employed because the current study requires latent variable scores to do further analysis (**Hair et al., 2019**). The latter method was performed in SmartPLS 3.0 (**Ringle et al., 2015**). The generated (latent) variables were imported to SPSS 23 to follow-up the analyses.

As stated before, the current paper investigates the moderating effect of generational cohorts on the relationship between UTAUT2 constructs and behavioural intention to use mobile banking. **Figure 2** illustrates the conceptual model related to the scope of this study. Hence, behavioural intention is affected by the UTAUT2 constructs: performance expectancy, effort expectancy, social influence, facilitating conditions, habit, and hedonic motivation. Based on the literature review, it is assumed that these relationships are moderated by generational cohorts (generations X, Y, and Z).

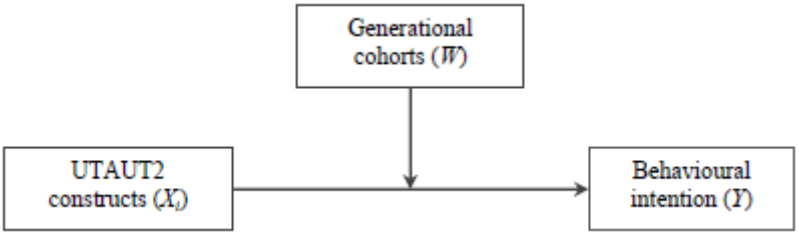


Figure 2 Illustration of the moderation effect

Figure 2 can be translated into mathematical formulas. The outcome variable is behavioural intention labelled Y. The direct effects of the UTAUT2 constructs on the outcome are coded as X_i. To calculate the moderating effect, the direct effect of the moderator on the outcome variable should consider (symbol W). The interaction of the UTAUT2 constructs with generational cohorts represents the moderating influence and can be measured by multiply with each other. Therefore, the following formula can be written:

$$Y = a + bX_i + cW + dX_iW;$$

where Y refers to behavioural intention, X_i represents the UTAUT2 model's constructs, W is the moderator, which is generational cohorts. In the present study, the moderator variable is multi-categorical (not a dummy). As it is explained earlier, there are three categories for generational cohort: generations X, Y, and Z. This means that the formula should be by including these categories as below:

$$Y = a + bX_i + c_1W_1 + c_2W_2 + d_1X_iW_1 + d_2X_iW_2,$$

which can be written as:

$$Y = a + c_1 W_1 + c_2 W_2 + (b + d_1 W_1 + d_2 W_2) X_i.$$

Since there are three generations, then the moderator variable is called multi-categorical moderator. For analysis purposes, only two categories are to be composed as variables compared to the selected generation. In this study, generation Y is considered a base category. Hence, W_1 refers to generation X, and W_2 is generation Z, and they are compared to generation Y.

To test the moderating effect of generational cohorts in the UTAUT2 constructs, data were imported in PROCESS, version 3.4 (**Hayes, 2018**), which can be added to SPSS as an add-in. Among other things, PROCESS version 3.4 can address similar issues when the moderator is multi-categorical.

4 Analysis and results

The latent variables should be created before testing the moderating effect of generational cohorts in the UTAUT2 model. Since the latter constructs are well established in technology adoption (so, it is not the case of exploring the underlying factors), their assessment was done in SmartPLS 3.0, a statistical computer program (**Ringle et al., 2015**). Among other things, this program estimates the loading values of each indicator under one factor, and their internal consistency reliability is indicated by the Cronbach's alpha (CA). After validating the constructs, the latent variables were imported into SPSS 23 for further data analysis.

Table 2 are presented the mean, standard deviation, item loadings, and CA values per each statement. Some items were removed from the analysis as the value of either loading or variance inflation factor violated the assumptions (Hair et al., 2019). After their deletion, the latent variables were composed. The last column in Table 2 is dedicated to the value of CAs. It ranged from 0.784 to 0.895, satisfying the requirement of being above 0.70 and lower than 0.95. These figures demonstrate a good construct's internal consistency reliability.

Table 3 illustrates the correlation between the UTAUT2 model's variables. As can be seen, performance expectancy, effort expectancy, facilitation conditions, and habit manifested a stronger correlation with behavioural intention to use mobile banking reflected than social influence and hedonic motivation. These results offer us a better picture about the nature of the relationships. Based on these figures, linear relationships are expected between behavioural intention and other UTAUT2 constructs.

The next step of the analysis is to investigate whether any difference in the UTAUT2 model's constructs between generations is displayed or not. To answer this question, the independent sample t-test was performed, and its results are shown in **Table 4**. Firstly, it was compared to generations Y and X. The test revealed that, compared to the individuals under generation X, those in Y scored significantly higher in facilitating conditions ($t = 2.654$, $p < 0.01$), and lower in social influence ($t = -2.346$, $p < 0.05$). When comparing generation Z and Y, excluding hedonic motivation ($t = 0.772$, $p > 0.05$), all the UTAUT2 constructs were scored higher by individuals in generation Y. It is interesting that generation Y scored lower than generation Z in social influence ($t = 2.401$, $p < 0.05$). The last comparison was between generation X and Z. According to the test, in comparison to generation Z, individuals in generation X scored lower in behavioural intention ($t = -4.080$, $p < 0.001$), habit ($t = -4.190$, $p < 0.001$), and performance expectancy ($t = -2.931$, $p < 0.01$). Taking together the three

sets of comparisons, it can be concluded that the moderating effect is expected to be present between generations Y and Z.

Table 2 Variable composition

	Mean	*Standard deviation*	*Loading*	*CA*
pe1	3.990	1.115	0.923	0.879
pe2	3.704	1.137	0.872	
pe3	4.178	1.104	0.896	
ee1	4.040	1.133	0.949	0.895
ee2	4.005	1.107	0.953	
si1	3.080	1.332	0.869	0.784
si2	2.890	1.383	0.834	
si3	2.820	1.280	0.798	
si4	4.063	1.091	Removed	
fc1	4.310	1.106	0.908	0.890
fc2	4.105	1.107	0.917	
fc3	4.159	1.085	Removed	
fc4	4.192	1.073	0.890	
hb1	3.609	1.168	0.910	0.796
hb2	2.906	1.226	0.676	
hb3	2.878	1.221	Removed	
hb4	3.665	1.130	0.910	
hm1	3.305	1.131	0.819	0.832
hm2	3.608	1.094	0.894	
hm3	2.989	1.184	0.768	
hm4	3.076	1.310	0.717	
bi1	4.136	1.067	0.895	0.860
bi2	3.750	1.102	0.899	
bi3	4.066	1.033	0.857	
bi4	3.917	1.092	Removed	

Notes: CA, Cronbach's alpha. PE, performance expectancy; EE, effort expectancy; SI, social influence; FC, facilitating conditions; HB, habit; HM, hedonic motivation; BI, behavioural intention.

The moderating effect of generational cohorts on the relationships of antecedents of intention to use mobile banking is shown in **Table 5**. This effect can be investigated by employing regression analysis. There are six UTAUT2 constructs (performance expectancy, effort expectancy, social influence, facilitating conditions, habit, hedonic motivation), indicating that six regressions should be performed. The first model includes effort expectancy and generational cohorts (generations X and Z) as a predictor of behavioural intention and generational cohorts' interactions with effort expectancy. The regression explained 34.9% of the variation of behavioural intention, and it was statistically significant, $F(5, 953) = 102.35$, $p < 0.001$. This result indicates that independent variables explain 34.9% of the variation in behavioural intention. The direct effect of effort expectancy on behavioural intention was positive and significant ($t = 0.593$, $p < 0.001$), meaning that higher behavioural intention can be achieved by increasing the level of effort expectancy. When comparing to generational Y, individuals in generation Z had significantly lower effect on behavioural intention (t = -0.251, $p < 0.001$), while those in generation X reflected no significant difference ($t = 0.045$, $p > 0.05$). Interaction effects of generational cohort with effort expectancy was negative and significant for generation Z ($t = -0.189$, $p < 0.01$), whereas for generation X it was insignificant ($t = 0.039$, $p > 0.05$). The latter results indicate differences between generation Y and Z in the effort expectancy-behavioural intention

relationship. Hence, compared to generation Y, individuals in generation Z reflected weaker influence on the effort expectancy-behavioural intention relationship.

Table 3 Correlation matrix

	PE	*EE*	*SI*	*FC*	*HB*	*HM*	*BI*
PE	1						
EE	0.757	1					
SI	0.220	0.200	1				
FC	0.716	0.714	0.215	1			
HB	0.530	0.435	0.313	0.501	1		
HM	0.386	0.341	0.536	0.417	0.488	1	
BI	0.669	0.558	0.216	0.665	0.710	0.417	1

Notes: All correlation coefficients are significant at the 0.01 level. PE, performance expectancy; EE, effort expectancy; SI, social influence; FC, facilitating conditions; HB, habit; HM, hedonic motivation; BI, behavioural intention.

Table 4 Independent samples t-test for each combination of generations

	Gen Y[b] vs. Gen X		*Gen Z[b] vs. Gen Y*		*Gen X[b] vs. Gen Z*	
	t	*p*	*t*	*p*	*t*	*p*
BI	0.465[a]	0.642	–5.377[b]	0.000	–4.080[b]	0.000
EE	1.698[b]	0.090	–3.958[a]	0.000	–1.860[a]	0.064
FC	2.654[b]	0.008	–3.745[b]	0.000	–0.984[a]	0.326
HB	–0.436[a]	0.663	–4.342[a]	0.000	–4.190[a]	0.000
HM	0.796[a]	0.426	0.772[a]	0.441	1.359[a]	0.175
PE	1.629[b]	0.104	–5.267[a]	0.000	–2.931[b]	0.004
SI	–2.346[a]	0.019	2.401[b]	0.017	–0.031[b]	0.975

Notes: aEqual variances assumed; bequal variances not assumed; cthe basis group. PE, performance expectancy; EE, effort expectancy; SI, social influence; FC, facilitating conditions; HB, habit; HM, hedonic motivation; BI, behavioural intention.

The second model includes performance expectancy as the independent variable (see **Table 5**). The regression showed that performance expectancy is positively related to the intention to use mobile banking (t = 0.711, p < 0.001). Regarding the interaction effects, it was found that generation Z reflected a negative impact on behavioural intention, meaning that, in comparison to generation Y, individuals in this generation displayed a weaker relationship between performance expectancy and intention to use mobile banking (t = -0.215, p < 0.001). The interaction effect of generation X with performance expectancy on behavioural intention was insignificant, indicating no moderating effect of generation X (t = -0.037, p > 0.05).

The third model considers facilitating conditions as the independent variable. The regression revealed that as an individual's level of facilitating conditions increases, so does the intention to use mobile banking (t = 0.720, p < 0.001). Similar to the previous models, evidence showed that the moderating effect of generation Z of the linkage between facilitation condition and the behavioural intention was statistically significant (t = -0.248, p < 0.001), while generation X was not significant (t = 0.028, p > 0.05). Moreover, the latter result demonstrated that generation Y manifested a stronger effect than generation Z (see **Table 5**).

Table 5 Results of the regressions

	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
Constant	0.056	0.027	0.028	0.070*	0.120**	0.139**
EE	0.593***					
PE		0.711***				
FC			0.720***			
HB				0.708***		
HM					0.382***	
SI						0.196***
Gen X	0.045	0.059	0.118*	–0.070	–0.006	–0.072
Gen Z	–0.251***	–0.164**	–0.220***	–0.199***	–0.425***	–0.442***
EE × Gen X	0.039					
EE × Gen Z	–0.189**					
PE × Gen X		–0.037				
PE × Gen Z		–0.215***				
FC × Gen X			0.028			
FC × Gen Z			–0.248***			
HB × Gen X				0.096		
HB × Gen Z				–0.172**		
HM × Gen X					0.100	
HM × Gen Z					0.067	
SI × Gen X						–0.018
SI × Gen Z						0.095
R square	0.349	0.471	0.482	0.518	0.214	0.073
MSE	0.652	0.530	0.518	0.483	0.757	0.928
F(5, 953)	102.35***	169.67***	177.57***	204.69***	51.91***	15.04***

*Notes: *** < 0.001; ** < 0.01, * < 0.05. Dependent variable, behavioural intention. PE, performance expectancy; EE, effort expectancy; SI, social influence; FC, facilitating conditions; HB, habit; HM, hedonic motivation; MSE, mean squared error.*

The direct effect of habit and its interaction with generational cohorts on individuals' behavioural intentions were investigated in the fourth model. As in the previous regressions, even this model reported a positive and significant influence of habit on individuals' intention to use mobile banking (t = 0.382, p < 0.001). Besides, comparing to generation Y, the moderating effect of generation Z reflected a weaker influence of habit on behavioural intention (t = -0.172, p < 0.01).

The fifth and sixth models reported an insignificant moderating effect of generational cohorts of the associations between hedonic motivation and social influence. On the other hand, the direct effects of latter UTAUT2 constructs on the intention to use mobile banking was statistically significant and positive (hedonic motivation, t = 0.382, p < 0.001; social influence, t = 0.196, p < 0.001).

5 Discussion

The findings of the present research are discussed based on the type of effects (direct or interactive) on the individuals' intention to use mobile banking as follows. The study confirms that all the UTAUT2 constructs are important predictors of behavioural intention regarding the direct effect. These relationships were positive, indicating that an increase in the level of the UTAUT2 constructs leads to a higher intention towards mobile banking usage. This insight aligns with prior studies (**Abrahao et al., 2016; Alalwan et al., 2017; Venkatesh et al., 2012**).

Regarding the role of generational cohorts on the UTAUT2 model, firstly, an independent samples t-test was used to investigate whether any difference between generations exists in the UTAUT2 constructs or not; and secondly, its moderating effect on the linkages between the latter constructs and an individual's behavioural intention toward using mobile banking. The data showed significant

differences in the UTAUT2 constructs based on the generational cohorts. According to the results of the t-test, excluding hedonic motivation, in all the UTAUT2 constructs, individuals under generation Y scored higher than those in generation Z. This finding is in line with previous research (**Ali** and **Maideen, 2019; Heaney, 2007**). From the authors' point of view, it is essential to analyse the role of age in the technology adoption models. However, it is suggested not to include age as a scale variable, but generational cohorts can be a better way out. This insight might be useful to explain and understand why prior studies (**Baptista** and **Oliveira, 2017; Makanyeza, 2017; Martins et al., 2014; Onyia** and **Tagg, 2011; Venkatesh et al., 2012**) failed to support the effect of age in accepting new technologies.

The investigation of the moderating effect of generational cohorts on the UTAUT2 constructs offered interesting insights. Hence, in comparison to generation Y, the moderating effect of generation X was insignificant in all analysed constructs. This result leads to the fact that between generation X and Y, there is no statistical difference in intention to adopt mobile banking as a means of payment. This finding is supported even by the t-test results (see **Table 4**), as it found no difference in behavioural intention between generations X and Y. The above finding indicates that individuals in generations X and Y behave similarly regarding the intention to use mobile banking.

Nevertheless, there were demonstrated significant differences between generations Y and Z. Hence, the evidence revealed that compared to individuals in generation Y, the moderating effect of generation Z on the relationships between the UTAUT2 constructs and intention to use mobile banking was important for the majority of the constructs. So, individuals in generations Y and Z do not act similarly in mobile banking adoption. It was found that the latter associations were weaker for individuals in generation Z, than for those in generation Y. The above insights indicate that behavioural intention of individuals in generation Z is less influenced by socio-cultural and technological factors, than people in generation Y. Hence, socio-cultural factors and technological factors are more resultative for individuals in generation Y when aiming the mobile banking usage. Prior studies support this finding, especially in performance expectancy (**Baptista and Oliveira, 2017; Venkatesh et al., 2012**). Regarding social influence, our research contradicts **Ruangkanjanases** and **Wongprasopchai's** (**2017**) study, as they reported its significant influence on intention to use mobile banking.

Studies have shown that individuals in the age group of 20-35 years old tend to have larger exposure to technology and a higher tendency to adopt and try new technologies (**Chen et al., 2007**). Therefore, employees, being the big chunk of the current population, have no choice except to involve themselves in technology usage. It can be a reason for them to reflect inclination towards ICT usage to perform and survive in the modern organisation that embraces technologies (de **Wet** and **Koekemoer, 2016**).

6 Conclusions

6.1 Implications

The current research attempted to investigate the role of generational cohorts (generation X, Y, and Z) in moderating the influences of the UTAUT2 constructs on behavioural intention to use mobile banking. Hence, two theories were combined: the UTAUT introduced by **Venkatesh et al.** (**2003**) and later extended by **Venkatesh et al.** (**2012**), and the generational cohort theory proposed by **Inglehart** (**2015**) in 1977. The first theory sheds light on the predictors of an individual's behaviour towards technology adoption. In contrast, the second one claims that people should be grouped according to their birth years because individuals belonging to a certain generational cohort have similar attitudes

and beliefs. It can be considered a theoretical contribution of this paper as it tested the capacity of the above theories to explain the behavioural intention towards mobile banking usage.

Keeping in mind the benefits of technology adoption, including the use of mobile banking, for society and industry, scholars and managers show interest in understanding the role of generational cohorts in accepting and using new technology. Considering this importance, academicians accentuate the need to study the individuals' technology adoption in different perspectives to get a better understanding of its puzzle and, therefore, to propose new ways that increase the level of usage of a certain technology (**Chaouali et al., 2017; Dahlberg et al., 2015; Ege Oruç** and **Tatar, 2017; Siyal et al., 2019**). Motivated by this need, the present study contributes to the knowledge as it offers new insights into the effect of generational cohorts in the UTAUT2 model.

Evidence showed that generational cohort matter in explaining the individuals' behavioural intention to use mobile banking. Hence, there is a clear difference between generation Y and Z in scoring in the UTAUT2 constructs and moderating the influences of antecedents of technology adoption on an individual's behaviour. It can be said that less effort is needed to adopt individuals under generation Z with new technologies. Furthermore, the relationship between the antecedents of the technology acceptance and intention to use mobile banking is stronger for generation Y than generation Z, supporting the previous research (**Ali and Maideen, 2019; Heaney, 2007**). This finding indicates that the impacts of antecedents of the technology adoption on behavioural intention are more resultative for individuals in generation Y, than those in generation Z. Additionally, it can be said that clients under generation Y have more complex financial footprints and experience. Therefore, they may make more extensive usage of mobile apps for banking and finances, and generation Z have little use for multi-function financial apps yet.

Regarding the practical implications of the research, the paper offers insights to managers, especially those in the bank industry, to adjust their strategies according to the generational cohorts of their clients. It may lead to yield high individuals' acceptance. Therefore, service design and development and marketing strategies should consider consumer segmentation based on generational cohorts. Moreover, during framing the strategy, managers should consider local conditions where their clients live, and harmonisation with the governmental policies aiming the implementation of new technologies is strongly suggested (**Hanafizadeh et al., 2019**).

6.2 Limitations and future research

The research is not free from limitations. Firstly, there are more females in the sample than males. Since the unemployment rate among the Balkans (South-Eastern Europe) is the highest in Europe, young people, mainly males, emigrates to advanced economies in Western Europe. Therefore, the actual share of males in these countries is lower, as public institutions report it. Secondly, there are more than four countries in Western Balkan. So, there are countries not covered by the current study. However, authors believe that their inclusion into the study will not change the results, as they share similar economic, institutional, and technological levels with those covered by this research.

Future research should be focused, among other issues, on the effect of financial literacy on intention and actual usage of mobile banking. It is believed that individuals with a high level of financial literacy are more prone to new technologies in their daily life. Moreover, social media might be an interesting topic not only for online purchase (**Çera et al., 2020b; Hossain et al., 2020**) but also for mobile banking usage. In addition, game elements can encourage individuals to use cutting-edge technologies (**Cera et al., 2020a**).

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Appendix

Behavioral intention	*(Venkatesh et al., 2012) and (Martins et al., 2014)*
BI1	I intend to continue using mobile banking in the future
BI2	I always try to use mobile banking in my daily life
BI3	I intend to consult the balance of my account on the app of mobile banking
BI4	I intend to perform a transfer on the app of mobile banking
Performance expectancy	*(Venkatesh et al., 2003, 2012)*
PE1	Mobile banking services are very useful in my daily life
PE2	Using mobile banking services increases my productivity
PE3	Using mobile banking services helps me accomplish things more quickly
Effort expectancy	*(Venkatesh et al., 2003, 2012)*
EE1	Learning how to use mobile banking services was easy for me
EE2	My interaction with mobile banking services is clear and understandable
Social influence	*(Venkatesh et al., 2003, 2012)*
SI1	People who are important to me suggested to use mobile banking services
SI2	My co-worker suggested to use mobile banking services
SI3	Mobile banking services use is a status symbol in my environment
SI4	I believe that companies should support the use of mobile banking
Facilitating conditions	*(Venkatesh et al., 2003, 2012)*
FC1	Mobile banking saves me time by avoiding going to the bank branches, waiting in the queue
FC2	I have the necessary resources to use mobile banking services
FC3	I have the necessary knowledge to use mobile banking services
FC4	Mobile banking is compatible with other technologies I use
Habit	(Venkatesh et al., 2012)
HB1	The use of mobile banking services has become a habit for me
HB2	I am addicted to using mobile banking services
HB3	I feel like I must use mobile banking services
HB4	Using mobile banking has become natural to me
Hedonic motivation	*(Venkatesh et al., 2012) and (Lin, 2011)*
HM1	My curiosity is often stimulated by mobile banking app
HM2	I enjoy using mobile banking
HM3	While using mobile banking, I felt a sense of adventure
HM4	I use mobile banking to keep up with the trends