# EXPANDING FINANCIAL INCLUSION FOR YOUTH: DOES DIGITALIZATION MATTER?

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***Abstract:*** *This paper analyzes how the digitalization of financial services contributes to the expansion of financial inclusion for youth by exploring its effects in Western Balkans. Its aim is to establish what indicators may have the most substantial influence on financial access in the region. Data for this study were collected from the 2017 Global Findex database for Albania, Bosnia and Herzegovina, Croatia, Montenegro, North Macedonia and Serbia. Data on the availability and use of mobile and Internet technologies were also applied. Three Probit estimations analyzed the data to find significance for factors wherein all variables were discrete and binary. The results indicate that being older, achieving a higher education and already being a user of digital technologies are all significant indicators of formal financial inclusion for the Western Balkans. Moreover, it is found that youth (15 - 29 years of age) are severely underbanked compared to their EU counterparts.*

***Keywords****: Financial inclusion, youth, digitalization, Western Balkans*

## 1. INTRODUCTION

Financial inclusion refers to accessing and using formal financial services. It is related to provision of affordable, accessible and relevant financial products and services to individuals and firms (Kumar & Mohanty, 2011), regardless of age, gender, social status, net worth or company size. Financial inclusions strive to remove barriers within the financial sector in order to drive development and improve living conditions equally for corporate entities and individual persons alike.

The level of financial inclusion varies. While start-ups find it difficult to gain a foothold into using financial services, companies that already have established credit histories are offered ease of access due to their prior inclusion into the financial market. In a similar manner, individuals also experience such issues. Those who have shown stable employment and a good credit history have access to a much wider range of more favorable financial services, possessing neither of these facets, youth

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(for this paper, from the age of 15 to 29) generally face problems when trying to access formal financial systems. They are also less likely to be included into the formal financial system, as they are less prone to own bank accounts, have savings or be able to borrow from financial institutions. Their lack of financial inclusion hinders their ability to secure funds for their education, start their own business or manage their own assets. Financial inclusion may also be stymied by other factors such as the economic development and financial system of one's country of residence, as well as gender and cultural trends of saving and borrowing (Kim, 2016).

The development of information technologies, digitalization and the development of widespread mobile solutions has had a high impact in the world of finance (Demigurc-Kunt & Klapper, 2013). Not only has burgeoning change influenced the products and services themselves, but it has revolutionized the distribution of financial services, lowered the costs of providing services and contributed to the increased access to finance. The use of information know-hows, such as mobile technologies (phones and smart devices) is widespread among youth enabling a catalyzation of their inclusion into more formal financial institutions. Affordability, as well as providing uninterrupted service and customer protection to customers is the basis of financial service quality. Usage, particularly denoting the consumer's financial literacy, is characterized by the consumer's ability to interact with and understand the service provided which may yield both positive and negative results determined by the understanding of usury laws related to the service (Naumenkova et al., 2019).

Accessing finance as well as the availability of financial resources and financial inclusion are all issues affecting companies and the economy itself, particularly in emerging and developing economies. Through the use of financial services, individuals and companies are able to invest in themselves through the purchase of goods or services that may lead to further growth. However, a fine distinction must be made between access to financial services and the need to use them in order to make a difference who may be counted as an active participant in a financial market. To illustrate, individuals may have access to formal channels of finance but choose not to use them due to having sufficient savings, cultural or religious reasons, cash economies, among other reasons. Having access to finance but opting not to use it is not relevant to general analysis since such individuals would generally have no need to include themselves into the financial markets and thereby not be "active" in it. Involuntary exclusion, on the other hand, is another matter. When one, whether an individual or corporate entity, wishes to access the formal financial system but is unable, it points to an inability to be active within the financial market. The most common reasons are given as insufficient income or collateral to assure repayment,

low credit scores, prohibitively high interest rates (Ljumovic et al., 2015). Recent research from Jaksic & Ljumovic (2020) showed that access to finance for the companies in the WB region is limited and lagging back compared to the EU countries. Vast majority of companies are financed from internal funds, and friends and family loans (Jaksic & Ljumovic, 2020).

This paper aims to analyze whether the digitalization of financial services contributes to the expansion of financial inclusion for youth through exploring its effects in the Western Balkans (WB). In particular, the paper seeks to establish what indicators have the biggest impact on financial access in the WB.

## 2. LITERATURE REVIEW

There had been no global database on individual financial status until 2011 when the Global Findex database (GFD) was established. The GFD, shedding light into how adults in more than 140 economies use formal financial channels to use bank accounts, conduct payments, build up saving, access loans and credit, and manage risk, has served as an outstanding resource to carry out data interpolation. Economies face their own challenges, and have their own achievements within financial inclusion. Reducing poverty, hunger and gender inequality have all been shown repeatedly and reliably within the literature to be an effective method to improve the financial lives of all. UN member states now use the GFD to track sustainable development goals (Global Findex Database, 2017).

One key policy tool utilized to promote prosperity, reduce poverty and improve macroeconomic stability (Kim, 2016), the GFD has fostered numerous empirical studies to be performed into the roots, causes and effects of financial inclusion. Financial inclusion itself is determined through quantitative and qualitative methods that characterize 1) financial access, 2) quality, 3) usage and impact. Access is understood to be the availability of service infrastructure, that is financial institutions, their branch offices and other representatives as well as internet and mobile access (Naumenkova et al., 2019).

Financial inclusion is generally seen as a rising tide that will float all boats. Yalaman-Oz (2019) specifically concludes financial inclusion to be critical to ending poverty. By entering a financial system, incomes grow over time, which likely results in larger revenues.

Examining 37 developing Asian countries, Park and Mercado (2015) find that financial inclusion both decreases poverty and lessens income equality. In an analysis of maximizing welfare policy, Mehrotra and Yetman (2014) examine the

effect of financial inclusion on welfare-maximizing monetary policy, reporting helps to remove volatility with the market, stabilizing both inflation and GDP, as well as boosts monetary policy.

Greater financial inclusion is associated with lower account costs, increases savings (Aportela, 1999), poverty reduction and economic growth (Beck, Demirgüc-Kunt, & Levine, 2007; Bruhn and Love, 2014) and investment of entrepreneurs (Dupas & Robinson, 2009). There is also a consensus in the literature that an increased level of financial inclusion may also provide considerable benefits for one's social well-being.

Altarawneh et al. (2020) also suggests that income and education together lead to expanded financial inclusion as those who have achieved a higher level of employment may also share stronger need to be included actively into financial services, thereby providing evidence that policies promoting financial inclusion should target marginalized segments of the population, such as youth and women.

For India, Kohli (2013) has underscored those factors bettering financial inclusion. Through the identification of the relationship shared between financial inclusion and human development in India, Kohli concludes that socio- economic factors, such as one's income level, were influential factors for financial inclusion.

On the basis of data reported within the 2014 GFD, Rojas-Suárez (2016) analyzed inclusion levels in Latin America according to three indicators by percentage of adults who have: 1) an account through a formal financial institution, 2) been using a financial institution to save over the past year and 3) borrowed from a formal financial institution over the past year. The inclusion gap was then shown to result from institutional weaknesses, poor enforcement of the law and tendencies for the sector to be dominated by financial cartels.

According to the latest data from the GFD, globally, about 1.2 billion adults remain unbanked, not possessing an account at a financial institution or through a mobile money provider (WB, 2017). The same database shows significant differences by age group, where unbanked adults are disproportionately young, with 30 percent of unbanked adults between 15 and 24 years old. This percentage is lower in developing economies and amounts to 23 percent, showing that financial inclusion depends to a great extent on economic development levels.

## 2.1. Are youth underbanked?

The share of youth in relation to the total population varies from country to country. Nations such as Ireland, Cyprus, Slovakia and Poland have the highest, where those 15 to 29 years of age comprise 24% of the population. Whereas, in Denmark, Germany and Italy, the share of the same segment comprises less than 18% of the total population. Matching the general trend of population decline of the Balkans, those 15 to 29 years of age comprise only roughly 10.5% of Serbia's population.

Compared from 2015 to the present day, there has been a drastic decrease in the number of young people in Serbia by about 7%, while the largest decline has been recorded in Croatia (9.39%) and Northern Macedonia (8.1%). The smallest has been in Montenegro (5.3%), which, while the lowest of the Western Balkans, is still significantly higher than the EU average (2.7%) (Table 1) (Eurostat, 2019). The 2013 census shows that the youth population in Bosnia and Herzegovina is also declining. Compared to the 1971 census, the percentage of young people in the total population was 34.4%, while the 2013 census shows a share of only 15.4%, more than halving over the last four decades (Kujović & Müller-Hennig,2019).

The increase of the number of young people also affects the youth unemployment rate (Pavlovic et al., 2019). On the other hand, numerous problems limit youth access to the labor market, but they are dominated by insufficient work experience, low wages, migration, regional differences and similar (Pavlovic & Ljumovic, 2016).

**Table 1. Population aged 15 to 29 in Europe and WB countries, 2015-2019.**

| 15-29 | 2015 | 2016 | 2017 | 2018 | 2019 | 2015/2019 |
|---|---|---|---|---|---|---|
| EU (28 individual MS) | 88,965,765 | 88,669,272 | 87,951,040 | 87,210,746 | 86,531,328 | -2.74 |
| Croatia | 755,363 | 739,397 | 720,498 | 699,788 | 684,437 | -9.39 |
| Montenegro | 126,508 | 124,565 | 123,018 | 121,276 | 119,822 | -5.29 |
| North Macedonia | 448,272 | 440,516 | 432,146 | 421.796 | 411,979 | -8.10 |
| Albania | 723,550 | 716,315 | 705,327 | 695,836 | 681,552 | -580 |
| Serbia | 1,244,924 | 1,217,682 | 1,197,357 | 1,176,212 | 1,156,611 | -88.313 |

Source: Eurostat, 2019

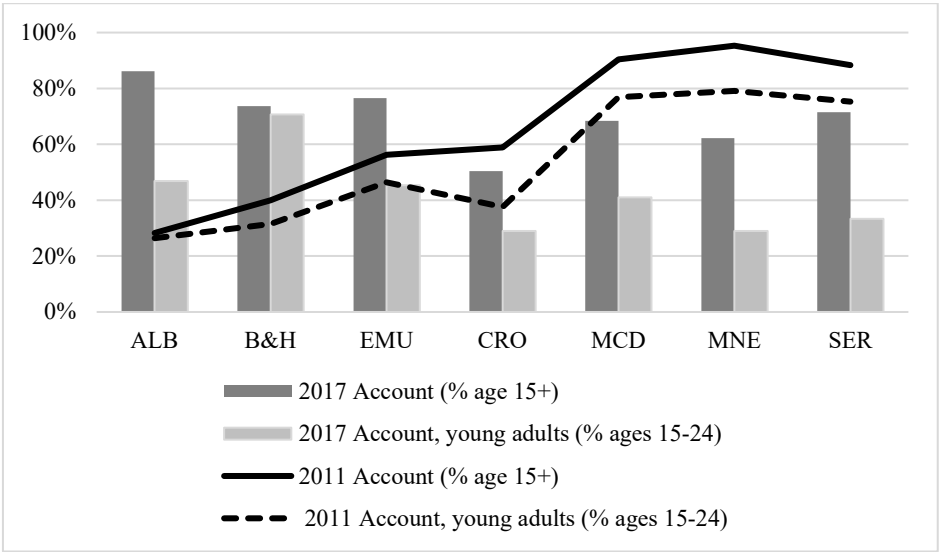
Youth in developing countries are less likely to have access to digital technologies than their contemporaries in developed countries (United Nations, 2019). Among all segments of the population, those 18 to 35 years of age use the Internet to a greater

extent than those older than 36. Van Rooij et al. (2011) and van Rooij et al. (2012) both note that financial literacy fosters good stockholding and act as a boost to wealth accumulation.

The results showed that 50% of adults have a bank account, but that this is largely influenced by determinant factors, such as development of the area in which they live and their respective level of income. While barriers to financial inclusion are its high cost, physical distance and inability to provide the proper documentation (Demirguc-Kunt & Klapper, 2012).

Having a bank account varies globally. While adults may be more likely to have an account at a formal financial institution in developed countries, it is only 41 percent in developing economies. The Middle East and North Africa have the lowest penetration of financial inclusion into a formal financial institution, with only 18 percent of adults reporting a formal account (Zins & Weill, 2016). Authors who used the DNB Household Survey in their research with market data on account-specific interest rates and characteristics came to the conclusion that knowing specifics may prevent households from securing the highest possible interest rate for the invested amount (Deuflhard et al., 2015).

**Figure 1. Bank Account Holders (2011 vs. 2017)**



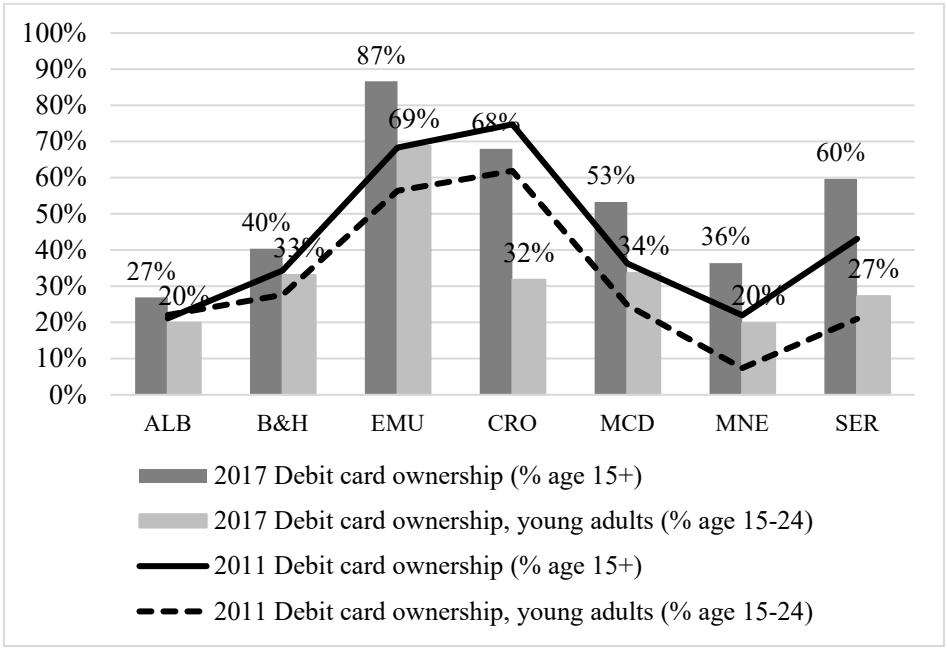

*Source:* Demirgüç-Kunt et al., 2018, based on the authors' calculation

Fig. 1 shows the share of account holders from 2011 and 2017 in the EMU and WB. Among account holders, Albania had the highest number in 2017 overall, while

B&H had the highest for those 15 to 24 years of age. Whereas the same group was lowest in Croatia, Montenegro and Serbia (<30%). More striking is the decrease among those 15 to 24 years of age who are account holders in 2017 compared to 2011 which almost halved for North Macedonia, Montenegro and Serbia as well as that the total account number significantly shrank in this same timeframe. Only in B&H and Albania did account rise regardless of age group, and only in the EMU was there an increase in account holders. Croatian saw the steepest decline.

In 2017, 87% of all adults in the EMU were debit card owners while 69% of youth were. This shows a general increase for all age groups compared to 2011. Croatia had the highest percentage of debit-card owners in 2017 (69%) in the WB but it also had the largest decline among youth debit card holders among those 15 to 24 years of age. Serbia showed the largest increase among all debit-card holders from 2011 to 2017, growing from 43% to 60%. Among those 15 to 24 years of age, debit card ownership in 2017 was lowest in North Macedonia (34%), Bosnia and Herzegovina (33%) and Croatia (32%) and Montenegro (20%) and Albania (20%) which was half that of the EMU.

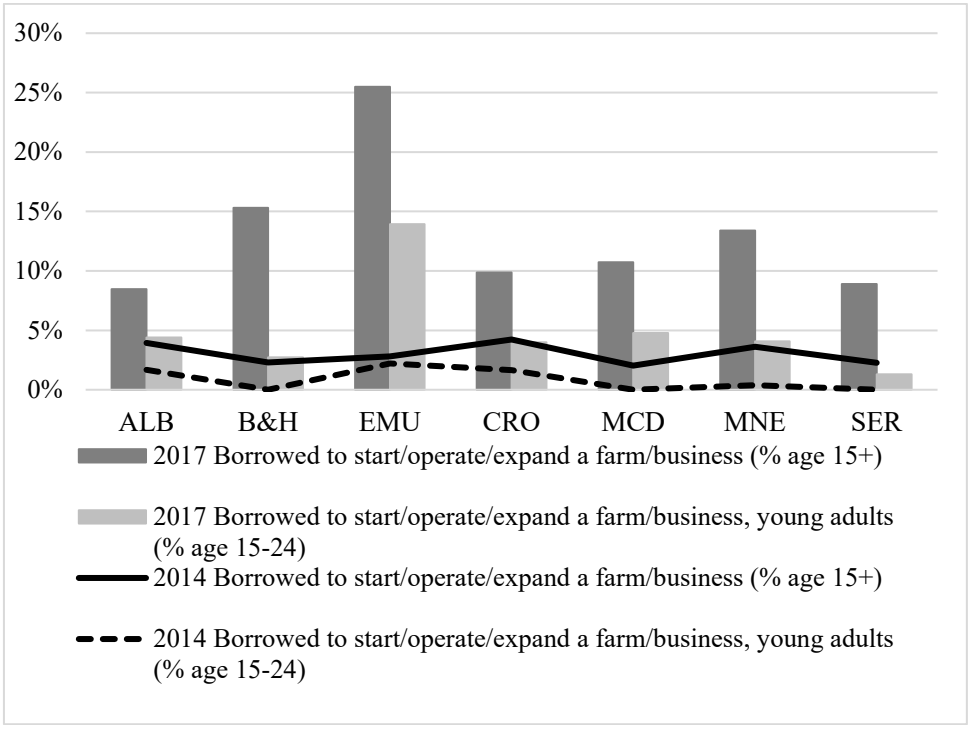
**Figure 2. Debit card owners (2011 vs. 2017)**




*Source:* Demirgüç-Kunt et al., 2018, based on the authors' calculation

Those 15 to 24 years of age generally did not borrow for business purposes within the WB. For instance, borrowing for such purposes was flat for youth from 2011 to 2017, while it only grew slightly from 0% in North Macedonia, Montenegro and Serbia, never rising above 4%. The WB stands in stark contrast to the EMU whose borrowing had markedly increased from 2011 to 2017, among all ages. For youth, in the EMU, borrowing rose from 2% to 13%. When excluding youth, for all age groups, borrowing significantly rose regardless of country.

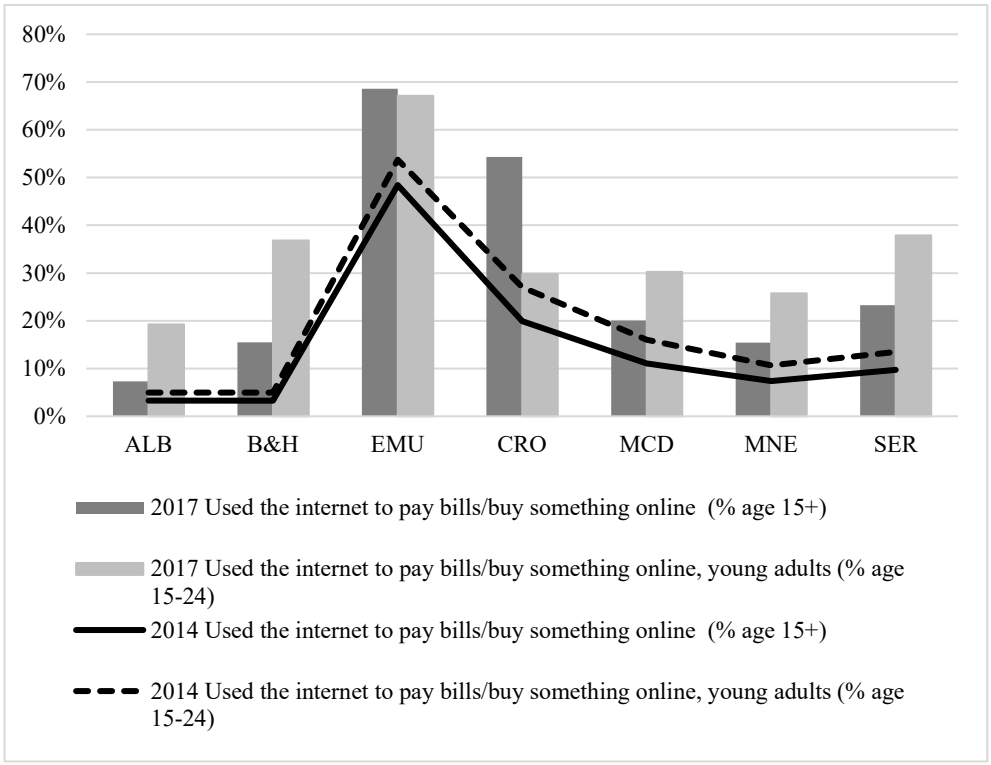
**Figure 3. Borrowed to Start, Operate or Expand a Farm or Business (2014 vs. 2017)**




*Source:* Demirgüç-Kunt et al., 2018, based on the authors' calculation

In 2017, in the EMU, approximately 70% paid bills or purchased items online regardless of age. There was a general increase in the use of online bill payments and online purchases from 2014 to 2017, with Serbian and B&H youth being the most substantial from roughly under 10 percent for Serbia and under 55 percent for B&H to being the highest in the WB in 2017 (both slightly lower than 40%) While the lowest percentage is recorded in Albania (roughly 20% among all and lower than 10% among youth), there has been a general increase for youth of all countries to use online payments or purchasing.

**Figure 4. Used the internet to pay bills or to buy something online (2014 vs. 2017)**




*Source:* Demirgüç-Kunt et al., 2018, authors calculation

Several studies have noted that access to finance for commercial entities in Serbia is limited, not adjusted to the needs of the SME and generally operates under unfavorable terms to the borrower. The capital market and alternative intermediaries are lacking where both corporate and individual borrowers are limited to lines of credit as sources of financing (Ljumovic et al. 2015, Ljumovic & Jaksic, 2020).

## 2.2. The determinants of financial inclusion

Individual socio-economic characteristics may influence the level of financial inclusion. Allen et al. (2016) has identified income, education, age, employment and marital status as bearing the highest influence globally. Studies from China have found income, education and age to be factors that positively influence financial inclusion, while gender is a limiting factor (for women) (Fungácová & Weill, 2015). There is a gender gap in financial inclusion in account ownership, formal savings and formal credit, wherein women are less likely to own an account, have formal

savings and formal credit (Demirgüc-Kunt et al., 2013b). Gender, income, education and age are factors influencing higher levels of financial inclusion. Education has been identified as one of the major factors influencing financial inclusion. Individuals attained a secondary-school education or lower are more likely to have access to informal credit (Klapper et al., 2012; Cole et al., 2009) and no savings or retirement accounts (Herd et al., 2012). In the context of educational achievement, those who have attained a university degree or higher are also more likely to have a bank account (Klapper et al., 2012; Cole et al., 2009). According to Cole et al., those who earn a higher income from financial investments are also much more likely to have saved for retirement, have higher credit scores and are less likely to declare bankruptcy in the USA (Cole et al., 2012). Credit card use has been reported to be equally prevalent across all age groups but not used for the same purposes by age group (Allgood & Walstad, 2013). Although young respondents are more likely to have less costly credit card behavior, they are also less likely to plan out purchasing items on credit in advance (Lusardi & Mitchell, 2011). From the Visegrad group, older respondents are also more likely to exhibit less costly credit card behavior (Allgood & Walstad, 2013). Financial behavior correlates to the demographic characteristics of age and gender within the economy, income quintile and education level (Thiessen, 2012). In research related to the Visegrad group counties, frequency of borrowing was linked to credit card ownership. In the same study, saving patterns also were found to influence financial inclusion. However, it was concluded that the findings are not universal. Qamruzzaman and Wei (2019) found a strong presence of bidirectional causality between long-term financial innovation and financial inclusion throughout Asia.

A number of studies have confirmed a positive relationship between the use of digital financial services, such as payment cards, paying online, mobile money services and financial inclusion. Digital financial services lower the cost of receiving payments and assists in managing financial risk by facilitating informal money transfers or remittances (Demirgüç-Kunt et al., 2018). Mobile money users may help to have a stabilising role to counteract unforeseen interruptions in income (Jack & Suri, 2014). In Niger, the introduction of mobile payments for government issued benefits reduced waiting times substantially (Aker et al., 2016).

Data from 2020 (Internet World Statistics, 2020) shows that there are a total of 397,988,114 Internet users in the EU, 89.4% of the total population. The extent of internet use and for what purpose is largely determined by economic and social factors (Pavlovic, Bjelica, 2019). In the WB, Croatia had approximately 3 million internet users in 2020 (92.3% of the total population), followed by Albania, 82.2 percent of households have internet access and Serbia, where 80.1% population has Internet access in their households (Republic Statistical Office, 2019). In North

Macedonia, Montenegro and B&H internet penetration is slightly lower, 78% (Statista, 2019), 74.3% (Monstat, 2019) and 70% (Knoema, 2019), respectively. Education is probably the most consistent global predictor of the use of ICT, particularly in terms of internet proficiency (Van Deursen & Van Dijk, 2009).

Low financial literacy is not being aware or educated on how basic elements of finance work, such as interest rates, and how financial tools function, such as credit cards or loans. Low financial literacy is not a localized but rather a globalized phenomenon. Low literacy has been found to be prevalent among US consumers (Huston, 2012), among developed economies (Lusardi & Mitchell, 2011), as well as among students from OECD countries (Lusardi, 2015).

The more educated one is, the more likely they are to be familiar with the financial tools and access offered to them. Financial literacy has been found to be related to financial behavior, which bears a direct impact on saving, borrowing, spending and investing decisions (Lusardi et al., 2010).

In 2010, Lusardi et al. (2010) came to the conclusion that youth are not financially literate, finding that fewer than one-third of young adults in the Netherlands understand how basic interest rates, inflation and risk diversification function. Moreover, they also claimed that socio-economic factors play an important role in determining financial literacy. In their study, college-educated males whose parents had both a stock portfolio and retirement savings were roughly 45% more likely to know about risk diversification than their female counterparts who had not completed their secondary school education and whose parents did not have retirement savings or public investments.

## 3. METHODS

The general hypothesis of this research is based on the assumption that youth in the WB is underbanked where the use of digital technologies can influence financial inclusion. The use of digital technologies refers to the electronic tools, systems, devices and resources to process a task, while financial inclusion indicates access and using formal financial services.

Our empirical specification focuses on three dimensions of financial inclusion, defined as (a) having an account at a financial institution, (b) saving using an account at a financial institution and (c) borrowing from a financial institution. In line with the literature analysed, we have focused on the individuals having an account at a financial institution, saving using an account at a financial institution or borrowing from a financial institution as measures of financial inclusion.

## 3.1. Sample

Data for this study were collected from the 2017 Global Findex database, described in Demirguc-Kunt and Klapper (2013). In the study, we used data for six countries of the WB (Albania, Bosnia and Herzegovina, Croatia, Montenegro, North Macedonia and Serbia). The Global Findex database is built, based on the surveys conducted using randomly selected, nationally representative samples in 144 countries and covering roughly 1000 people in each economy. The survey was carried out by Gallup, Inc., in association with its annual Gallup World Poll. The target population is the entire civilian, noninstitutionalized population aged 15 and above (Demirguc-Kunt et al., 2018). The database provides micro-level data, containing socio-demographic and economic indicators, such as gender, age, income, education, data on employment, as well as indicators on the financial inclusion and the use of digital services. In our analysis, only the data for WB countries was extracted first, thereafter all data referring to the population of youth was collected (age 15-29). 1,364 samples were thus collected.

## 3.2. Variables

The individual characteristics represent socio-demographic and economic characteristics of the individuals participating in the survey. Gender is a dummy variable equal to one if the individual is a woman (female) and zero if not. We expect this variable to be negatively associated with the likelihood of financial inclusion. The income variable categorically takes the value of 1 for the poorest 20%, 2 for the second 20%, 3 for the third 20%, 4 for the fourth 20% and 5 for the fifth richest quintile. The education variable is also categorical, taking the value 1 for primary school or less, 2 for secondary education and 3 for tertiary education. We have also checked for employment, i.e., whether the respondent is active in the workforce or not. The employment dummy variable equals one if the individual is in the workforce and zero if not. We expect these variables to be positively associated with the likelihood of financial inclusion.

In order to investigate the influence of digitalization on financial inclusion, we used the information provided on the availability and use of mobile and Internet technologies. The variables “Made bill payments online using the Internet” and “Bought something online using the Internet” were both used to capture the use of digital technologies. All variables are equal to one if the answer was “yes” and zero if not. We expect these variables to be positively associated with the likelihood of financial inclusion.

**Table 2. Variable definition**

| Variable | Definition |
|---|---|
| account | Dummy = 1 if the person reported to have an account at a financial institution (a bank, credit union, cooperative, post office, or microfinance institution); 0 if not. |
| saving | Dummy = 1if the person reported to have an account and uses it to save at a financial institution; 0 if not. |
| borrowing | Dummy = 1if the person reported to have an account and uses it to borrow at a financial institution; 0 if not. |
| gender | Dummy = 1 if the respondent is female; 0 if not |
| age | Age of the respondent in years |
| education | Categorically, takes a value from 1 to 3 depending on the level of education |
| income | Categorically, takes a value from 1 to 5 depending on the income quintile |
| workforce | Dummy = 1 if the respondent is employed; 0 if not |
| Made_bills_online | Dummy = 1 if the respondent has paid bills online; 0 if not |
| Bought_on_line | Dummy = 1 if the respondent has a bought product/service on-line; 0 if not |

## 3.3. Descriptive statistics

In the sample, 828 individuals stated that they have an account at a financial institution (60.7%), while 536 claimed that they do not own an account (39.3%). There are 367 individuals who have savings accounts (44.3%), while 393 respondents claimed that they have an account and borrow from a formal financial institution. The countries are represented as: Albania 246 samples (17.8%), B&H 222 samples (16.1%), Croatia 320 samples (23.2%), North Macedonia 171 (12.4%), Montenegro 280 (20.3) and Serbia 143 (10.3%). Descriptive statistics of independent variables are presented in Table 3. Women are more represented in the sample. The average age of the respondents is 22.59 years. More than 60% of the respondents have a secondary education, while more than 50% are employed. Only 14.8% of young individuals made bills on-line using the Internet, while 31.9% bought something on-line using the Internet.

**Table 3. Descriptive statistics for the independent variables (by estimation)**

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Gender | 1362 | 0.513 | 0.500 |
| Age | 1362 | 22.590 | 4.058 |
| Primary education | 1362 | 0.179 | 0.383 |
| Secondary education | 1362 | 0.601 | 0.490 |
| Tertiary education | 1362 | 0.221 | 0.415 |
| Income: poorest 20% | 1362 | 0.155 | 0.362 |
| Income: second 20% | 1362 | 0.167 | 0.373 |
| Income: third 20% | 1362 | 0.181 | 0.385 |
| Income: fourth 20% | 1362 | 0.199 | 0.399 |
| Income: fifth 20% | 1362 | 0.298 | 0.458 |
| Respondent is in the workforce | 1362 | 0.520 | 0.500 |
| Made_Bills_Online | 1362 | 0.148 | 0.355 |
| Bought_On_Line | 1362 | 0.319 | 0.466 |

In order to evaluate the socio-demographic and economic determinants of financial inclusion in the WB region and to analyze the influence of digital technologies on financial inclusion, we performed three probit estimations since all variables are discrete and binary.

The dependent variable $y_{1ij}$ defines owning a account, $y_{2ij}$ defines a savings account at a financial institution and $y_{3ij}$ defines borrowing from a financial institution

$$y^*_{nij} = x_{nij}\beta + \varepsilon_{1ij}$$

$$y_{nij=1,\ if} \quad y^*_{nij>0}$$

$$y_{nij=0,\ if} \quad y^*_{nij<=0,}$$

where countries and individuals are indexed by $i$ and $j$ respectively, and $n$ is index referring to 1 - owning an account at financial institution, 2 - a savings account at a financial institution and 3 - borrowing from a financial institution; $y^*_{nij}$ is a latent variable, $x$ is a vector of individual level characteristics, $\beta$ is a vector of parameters and $\varepsilon_{1ij}$ is a normally distributed error term with zero mean and variance equal to 1. For 2 and 3, the variable is required for individual to be included already into a formal financial institution, the estimate includes only respondents who already own an account. The account variable is dummy equal to one if the person responded "yes" and zero if not. The variable savings is dummy equal to 1 if the individual has an account and uses it to save. The variable Borrowing is dummy equal to 1 if the individual has an account and uses it as a savings account.

Individual characteristics (gender, age, income, education and employment), data on use of digital technologies (paid bills on-line, bought something on-line) and financial behavior (savings and borrowing) are explanatory variables.

Data in Table 4 present the results and the marginal effects of the probit estimations for the three chosen indicators representing financial inclusion: ownership of an account, formal savings and borrowings. Several dependent variables grouped as socio-demographic and economic factors are found to have a significant relationship with owning an account: education, age and employment. Moreover, the dependent variables grouped as factors pointing to the use of digital technologies all bear a significant relationship to owning an account: made_bills_online, bought_on_line. Being a woman is not a significant result when interpreting the relationship to owning an account. Age is statistically significant, with a positive coefficient corresponds to the likelihood of a young person to have an account increases with age, with an 11.18% chance of owning an account as age increases. Education is positively associated with financial inclusion, with larger coefficients for higher education level attained, pointing out that the likelihood to own an account increases with the level of education completed. The chances for respondents with tertiary education are 1.5 times higher than for that of only achieving a primary education. The likelihood of owning an account is also higher among the employed, where employment status increases the odds of owning an account by around 58.4 per cent. Income is also positively related to financial inclusion, with larger coefficients for wealthier respondents. The only exception is the third quintile, which we did not find statistically significant. In other words, as the income increases, the odds of having an account in a financial institution also increases.

All indicators related to the use of digital technology have positive coefficients. Young people who pay bills on-line increase the likelihood of owning an account approximately 1.6 times. If they have bought something on-line using, the likelihood increases 43.47% for being financially included. Overall, these results point to the relationship between the use of digital technologies among youth and having an account.

Savings at the financial institution is statistically significant partially to certain factor from variable education and income, to employment and all factors related to the use of mobile and internet technologies. Education is negatively related to savings, but it is only significant for secondary education, decreasing the odds of savings for respondents with secondary education for 37.93 percent. Also, results are partially for the income. Statistically significant is only fifth quintile, where the odds of savings increase for 48.43 per cent for each increase in the quantity of income. Savings is also related to the status of employment, increasing the odd of having a

savings for 38.12% if the respondent is employed. As in the previous two variables, we found a statistically strong relationship between savings at formal financial institutions and use of mobile and internet technologies. Both factors are positively correlated with savings, increasing the odds for 29.17 if they pay bills on-line and 43.04 per cent if they bought something on-line.

Finally, education, income, gender, age and employment status are not significant results when interpreting the relationship to borrowing from a financial institution. However, results point to a positive statistically significant result of all factors related to use of mobile and internet technologies. The odds of borrowing at a financial institution for youth increases if they pay bills on-line using the internet or if they bought something on-line using the Internet, for 84.58 and 23.86 per cent respectively.

**Table 4. Estimations for the likelihood of the indicators related to the financial inclusion**

| **Variable Model**<br><br>**Model**<br>**Individual determinants** | **(1)**<br>**Account**<br>**Probit**<br>**Yes** | **2)**<br>**Savings**<br>**Probit (selected)**<br>**Yes** | **(3)**<br>**Borrowing**<br>**Probit (selected)**<br>**Yes** |
|---|---|---|---|
| (Intercept) | -3.555* | 0.131 | -0.893* |
| | (0.284) | (0.405) | (0.404) |
| [educ=3] | 0.922* | -0.361 | -0.209 |
| | (0.161) | (0.235) | (0.232) |
| [educ=2] | 0.704* | -0.477* | -0.212 |
| | (0.120) | (0.215) | (0.212) |
| [educ=1] | 0a | 0a | 0a |
| | . | . | . |
| [inc_q=5] | 0.480* | 0.395* | 0.146 |
| | (0.128) | (0.162) | (0.161) |
| [inc_q=4] | 0.448* | 0.316 | 0.138 |
| | (0.134) | (0.172) | (0.171) |
| [inc_q=3] | 0.235* | 0.074 | 0.220 |
| | (0.136) | (0.181) | (0.177) |
| [inc_q=2] | 0.394* | 0.123 | 0.149 |
| | (0.138) | (0.181) | (0.178) |

| **Variable Model**<br><br>**Model**<br>**Individual determinants** | **(1)**<br>**Account**<br>**Probit**<br>**Yes** | **2)**<br>**Savings**<br>**Probit (selected)**<br>**Yes** | **(3)**<br>**Borrowing**<br>**Probit (selected)**<br>**Yes** |
|---|---|---|---|
| [inc_q=1] | 0a | 0a | 0a |
| Gender | 0.141 | -0.059 | -0.016 |
| | (0.083) | (0.093) | (0.092) |
| Age | 0.106* | -0.021 | 0.024 |
| | (0.013) | (0.016) | (0.016) |
| Emp_in | 0.460* | 0.323* | 0.141 |
| | (0.088) | (0.106) | (0.105) |
| BoughtOnLine | 0.361* | 0.358* | 0.214* |
| | (0.096) | (0.098) | (0.029) |
| MadeBillsOnline | 0.947* | 0.256* | 0.613* |
| | (0.166) | (0.115) | (0.117) |
| *Observations* | *1364* | *828* | *828* |

*Notes:* Columns represent estimation results of a logistic regression of financial inclusion variables as defined. Standard errors are in parentheses and * denotes significance at the 5% level.

It is important to note that due to the cross-sectional nature of the data we can only interpret these results as significant correlations between individual characteristics and measures of financial inclusion and not as causal relationships. We can conclude that among youth in the WB countries the likelihood of having account, and as such being financially included increases with age, education, partially with income, employment status, use of digital technologies. Several studies point out to the relation between gender and financial inclusion, pointing out that the female population is generally experiencing lower levels of financial inclusion. Vast of them point out to cultural reasons Aterido et al. (2013), legal and social norms (Demirgüc-Kunt et al., 2013b), while market failures are overall not responsible for gender discrimination (Zins & Weill, 2016). Our results are partially consistent, with research dealing with general population (rather than youth) Allen et al. (2016); Fungácová & Weill, 2015; Demirgüc-Kunt et al. (2013b); Zins & Weill (2016); Klapper et al., (2012); Cole et al., (2009). However, based on our finding, opposite to the mentioned research, we did not find statistically important correlation between fender and financial inclusion among youth in the WB countries. Nevertheless, there is a great connection between the level of development of society and the inclusion of women in public and private, political and economic life of the country (Pavlović & Ljumović, 2016).

Several prior studies confirm positive relation between the use of digital financial services, and financial inclusion (Demirgüç-Kunt et al., 2018; Jack & Suri 2014; Qamruzzaman & Wei, 2019; Aker et al., 2016; Muralidharan, Niehaus, & Sukhtankar, 2016). The finding of this research on a sample of youth from WB countries supports prior quantitative studies in addressing the connections between the use of digital financial services and financial inclusion.

## 4. CONCLUSION

As has been found within this research, the countries of the WB (Croatia, Serbia, Bosnia & Herzegovina, Albania, Montenegro and North Macedonia) have not achieved the same level of financial inclusion in comparison to that present within the EU. As increased levels of financial inclusion can substantially improve living standards, this is evidence of lower living standards in the WB. However, with the rise in use of digital technologies, more inclusion through online payment and mobile banking has been generated in the formal financial sector. In our research, we investigated whether youth people in the WB are underbanked and whether digitalization of financial services is able to increase their financial inclusion. The results found that, compared to the general population, youth are underbanked. A correlation was also found to exist between the use of digital technologies among youth and financial inclusion. More crucially, it was also concluded that one is more likely to be financially included if they are older, more educated and employed, as well as if they are a user of digital technologies. These results can be useful for future research as well as for decision makers to find methods to study inclusion form existing data as well as to craft policies that will aim for more inclusion within the formal financial sector.

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