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HOW MUCH DO HUNGARIANS USE FINTECH?[1]

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ABSTRACT

The use of FinTech instruments is clearly gaining momentum in Hungary nowadays. The characteristic features of potential users provide important information for both the academic community and businesses. It can reveal the demographic and behavioural features of economic actors that are worth targeting to reach a wider group of users and to increase market share. The objective of this study is to provide a picture of the extent of fintech use by Hungarians, as well as to analyse the potential impact of fintech services to improve financial inclusion. Financial inclusion is interpreted as holding and using a bank account.

Fintech use is analysed on a representative sample of a thousand people categorised by gender, age, and type of locality. An omnibus research questionnaire was used for data collection thanks to a tender by the University of Pécs. The questionnaire presents to what extent different services are known and used. It also offers an evaluation of statements regarding different attitudes. Based on the data, factor and cluster analysis was also conducted. The factor analysis of the questions related to attitudes was used to identify different mindsets, which were the basis to generate expected types of behaviour applying cluster analysis. The emerging types of behaviour served to draw our conclusions in line with demographic features.

Overall, the analysis suggests you cannot prove the assumption relating to most demographic factors, such as that young people and those with a higher income are the typical users of fintech services. In fact, it is the highly educated middle-

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aged population that can be said to be active fintech users. It has also become clear that most of the population are adverse to fintech services.

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1 INTRODUCTION

The products of fintech service providers, i.e. financial technology enterprises keep spreading in this country. The fintech phenomenon is nothing new in this respect as an appetite for high-tech innovation has always been present in the finance sector (MNB, 2024). As you can see in the chapter on the history of fintech, its development halted because of the loss of income after the world economic crisis in 2008. However, it opened new vistas for startup enterprises that, arriving from outside the banking industry, started to promote new easily available financial services. As a result, the banking institutional system has changed and has become decentralised by now (Gordán, 2018). In addition, fintech service providers had a major advantage in terms of costs, which offered users cheaper opportunities and higher investment interests. As you will see later, lower costs typical of fintech service providers are not sufficient to spread the service; trust, perceived usefulness and simplicity of use also play a part (Lachwani–Jain, 2021).

Hungarian fintech users are mostly aware of payments and account service providers. Those include traditional banking applications, such as the Instant Payment System, Transferwise (currently named Wise) and Revolut. International studies have proven that such financial service providers support financial inclusion more due to their lower costs and easy access, or to put it differently, they hinder financial exclusion (Aron, J, 2017; Kempson et al, 2000).

The objective of this study is to describe the demographic features of Hungarian fintech users. Using factor analysis on the questions relating to attitude, the mindset of respondents is identified. Next, applying cluster analysis on those factors, typical behaviour regarding fintech use is identified. Finally, it is revealed how different demographic features appear in the behavioural groups generated by the cluster analysis of the factors. The identification of such mindsets and behaviours might be useful later on both for fintech research into consumers' behaviour and for the market positioning of the fintech companies existing in the corporate sector.

The objective of this study, on the one hand, is to present how much Hungarian users are aware of fintech instruments and services and how they use them. On the other hand, the authors want to reveal what attitudes users have *vis a vis* those novel financial solutions.

2 LITERATURE REVIEW

Prior to describing the findings of our questionnaire survey, the concept and development of fintech are reviewed including the meaning of international financial exclusion, the trends of international financial inclusion, and fintech use as well as the factors and attitudes influencing fintech use.

2.1 Fintech: its concept and history

According to the FinTech and Digitisation Report by the National Bank of Hungary (MNB, 2024), the term 'fintech' covers technological solutions with the aim of improving the effectiveness of financial services as well as providing new innovative services. According to the definition by the Bank of England (2023), 'combining the words 'financial' and 'technology', fintech is technology-enabled financial innovation, which is changing the way financial institutions provide – and consumers and businesses use – financial services.' According to McKinsey & Company (2024), fintech companies are enterprises which mainly rely on technology to fulfil the basic functions of financial services affecting how money is stored, saved, borrowed, invested, transferred and protected.

Technology-supported innovation applied to financial services appears in all definitions. However, different aspects of innovation are emphasised in each case. To understand why definitions can be so diverse, you should provide a non-exhaustive list of services offered under the umbrella term 'fintech.'

On the one hand, neo-banks like Revolut or digital banking in general, which is typically connected to traditional banking service providers, are popular. Mobile payments and digital wallet services are also popular. They are applications and platforms that allow fast and secure electronic payments. They include PayPal or Google Wallet. In addition, peer-to-peer lending and crowdfunding platforms also belong to fintech, the former targeting lending between people while the latter is focused on the funding of enterprise initiatives. The technology-based enterprises of the insurance industry include Insurtech companies, while RegTech platforms support regulatory compliance and risk management for financial institutions. Further, you should not forget about different blockchain technologies

and the operation of cryptocurrencies which support smart contracts by means of decentralised ledger technologies. Forward-looking robo-advisors and algorithm-driven trading platforms are also within the framework of fintech (Szota, 2019). Accordingly, it is clear that such diverse levels of application do not allow to devise a specific definition covering all areas, which is hampered further by development and an ongoing appearance of new technologies and areas of use.

The history of fintech started in 1866 and it can be divided into four periods. The first period lasted from 1866 to 1967. In the 1860s, telegraph technology and the first transatlantic cable allowed for faster execution of financial transactions. By the end of the 19th century, telegraph networks had become accessible for financial institutions, which promoted effective communication and the execution of transactions. In the middle of the 20th century the first automated bookkeeping systems and bank computers appeared simplifying book-keeping, which had been manual earlier. The next milestone arrived in the 1950s when the first credit card, Diners Club, was introduced, which has revolutionised payment systems (Taneja–Vardari, 2025). In the 1960s, banks started to apply electronic data processing more and more, which laid down the basis of modern digital banking systems (Nematli, 2024).

The second phase of development occurred between 1967 and 2008. The installation of the first cash machine (ATM, Automated Teller Machine) in 1967 was one of the most important fintech innovations, which launched the era of automated financial transactions. In the 1980s, banks started to develop electronic payment systems and digital databases globally, which allowed remote access to financial services for their customers (Aarabi Moghaddam et al., 2024). The spread of the Internet in the early 1990s promoted the birth of the first online banks. Economic players such as PayPal (1998) revolutionised electronic payments by providing fast and secure online transactions (Lu, 2024). At the same time, digital trading started at stock exchanges, which has significantly transformed money markets.

The third phase has been ongoing since 2008 to our days. Following the 2008 financial crisis, fintech entered a new age. Distrust of traditional banks has promoted the spread of decentralised financial technologies (DeFi) and cryptocurrencies. The appearance of Bitcoin in 2009 triggered a revolution in digital financial systems relying on blockchain technology (Casey et al., 2025). Then the spread of smart phones promoted the appearance of mobile banking platforms and mobile banking applications as well as the proliferation of mobile payment systems (e.g., Apple Pay, Google Pay, Alipay). At present, AI-based solutions, such as robo-advisors, gain popularity in the field of financial advisory services (Shen et al., 2025). In addition, open banking and AI-based fintech innovation allowed the integration and customisation of financial services, which has led to the generation of new business models.

The fourth phase of fintech is expected in the future driven by the spread of AI technology and DeFi. The future of fintech will be decided by AI-based decision making, blockchain technologies and increasingly stringent regulations. Artificial intelligence is to play a major part in risk assessment, fraud prevention, and credit rating, while decentralised financial services (DeFi) will present new challenges to regulatory bodies (Kandpal et al., 2025).

How will AI help the provision of financial services in future? On the one hand, by improving credit rating and access to loans. AI-based alternative credit rating models allow banks and fintech companies to offer loans to customers who have no traditional credit history. AI is able to analyse creditworthiness from behavioural data, mobile payment habits, and presence on social media (Shukla et al., 2024). On the other hand, the appearance of AI chatbots and automated customer services allow financial institutions to offer their services to customers who traditionally do not have access to them, for instance, due to the lack of bank branches. In addition, AI-based customised financial offers promote the financial inclusion of users (Al Refai, 2025). Further, AI will promote the financial inclusion of the part of the population that is currently excluded, which will be discussed later in this study. With the help of AI, financial services will become accessible at places where there is no built-up banking infrastructure. The spread of smart phones and mobile banking applications play a major part in that process (Yoganandhan, 2025). Robo-advisors offering automated investment advisory services are a pioneering application of AI. Such algorithms offer investment advice based on customers' financial status and targets; therefore, they offer a more cost-effective version of traditional financial advisory services (Shen et al., 2025).

In addition to customer inclusion and improved user experience, AI can assist financial institutions to prevent frauds. Machine learning can perceive anomalies and identify suspicious transactions reducing in that way the risk of abuse (Roy-Vasa, 2025). Using AI can open a new era not only in banking but also in the field of internal banking procedures by opening a new chapter of fintech services.

To sum up, it is obvious that fintech has made a major development since the first transatlantic cable was laid and the installation of the first cash machine to today's world of mobile banking services and digital wallets. This development has not stopped since Open Banking and AI has opened up new areas for further innovation or fully customised services that may soon become reality.

With regard to fintech, you should not forget about the evolution of the regulatory environment. In their study, Shala and Shkurti (2022) analysed and compared the regulatory environment of the countries in Central-Eastern Europe (CEE). The authors used both qualitative and comparative methods to analyse the countries of the region paying particular attention to the flexibility of the regulatory environment, the time requirement of licensing procedures, and to find if there

are tools supporting innovation such as regulatory sandboxes or fintech specific regulatory platforms. According to the study, the development of a fintech ecosystem is slow in most CEE countries not only because of economic factors but also due to obsolete or overly rigid regulatory structures. The shortcomings of implementing the regulations related to digital identity, remote customer identification and open banking (PSD2) have been found especially critical. Efforts to promote digital financial inclusion have been made at several places, but they often lack the necessary institutional support or transparency. In the end, the authors emphasise there is a need in the region for a complex fintech strategy, harmonised regulatory principles and a more initiative-taking regulatory practice so that fintech companies can operate competitively in the global space of innovation (Shala–Shkurti, 2022).

2.2 Characteristic features of financial exclusion

A separate branch of finance research deals with the concept of financial exclusion. Financial exclusion bars people living in certain geographical locations or belonging to certain social strata from access to financial banking services. Although they may be offered some basic services (such holding a bank account), they have no access to higher level services, for instance, bank loans (Leyshon, 1997). English language literature makes a difference between unbanked and underbanked groups, in Hungarian, however, there are no separate terms for them, they are called discriminated or excluded communities just as any other types of discriminated groups.

According to the Worldbank Global Financial Inclusion Database, 50.6% of the global population aged 15+ held a bank account in 2011, while the latest data of 2021 show the ratio had increased to 76.2% over ten years. The ratios are significantly better in the European Union. In 2011, 90.4% of the 15+ population held a bank account, which had increased to 98.5% by 2021. The relevant figures were 72.7% for the 15+ population in 2011, which had increased to 88.2% by 2021.

Financial exclusion can appear in several forms. On the one hand, it means banks divert the sales of certain products – e.g., bank loans, from the poorer groups to the richer ones. In other words, they prefer offering loans to people who do not absolutely need them, but repayment by them is safer. On the other hand, it can also happen that bank branches are simply not opened in poorer areas, or they are the first to be closed down in a closure wave. Another example is that poorer groups are not completely excluded from access to certain products, but they are forced to pay higher fees or 'punitive interests,' which will hinder demand (Gál, 2016). By excluding poorer groups from access to funds, banks do not only conserve their

social position but also the state of the built-up environment and poverty itself. As a result of being excluded from access to bank loans, such people are forced to turn to secondary or tertiary financial service providers (Dymski–Veitch, 1996). Therefore, financial exclusion causes not only economic but also social problems. Who has no access to regular, official financial products is forced to make use of more expensive non-regulated alternatives, such as loan sharking, which exacerbates poverty and indebtedness (Hegedüs et al., 2017).

Hit by the 2008 economic crisis, financial service providers have become more risk averse in this country, so many households have become excluded from the standard financial system. The spread of currency lending and its adverse consequences have also contributed to the loss of confidence, mainly in the underprivileged categories (Tóth–Medgyesi, 2014). The integration of the savings cooperative sector in 2013 has aggravated the problem. An earlier decentralised structure has been transformed into a centralised one. According to Kovács (2019), the process has had an adverse effect on local embeddedness and has increased the risk of financial exclusion, particularly in the rural areas. As bank branches closed down, many settlements have lost their financial service provider, which has aggravated the financial integration of the local population. To offset it, in his study, Kovács (2019) introduces and recommends the use of mobile bank branches and local currencies, such as local alternative currencies to mitigate financial exclusion. Although such means can improve access to financial services to some extent, they are not sufficient, by themselves, to fully solve the problem. The local community must be involved, and a suitable regulatory environment must be established for success.

The international struggle against financial exclusion affects a number of organisations. For instance, it already commenced in the United States in 1977 with respect to a measure by Congress. The Community Reinvestment Act adopted at that time aimed at providing access to bank loans and other services for residential communities that used to have banking service providers earlier (Tickell, 2000). Further, the OECD also reiterates among its sustainability goals that financial services should be made accessible to all, particularly to disadvantaged groups. Other research on the topic including several Worldbank publications (2016) support that the spread of products promoting financial inclusion, such as government programmes, micro-loan programmes and other varieties can have a beneficial impact on combating poverty (Worldbank, 2016).

Realising the problem and its serious nature, the National Bank of Hungary has launched different projects over the past years to improve financial awareness. Financial education at schools, financial advisory services or community bank initiatives are important steps to mitigate social inequality (MNB, 2022). Nevertheless, a complex intersectoral approach is required to ease financial exclusion,

which will not only impact the financial industry but also social policy, education, and territorial development (Székely, 2019). Locally customised projects such as financial mentoring at settlement level might be more effective than general nationwide campaigns.

Fintech solutions, which are gaining momentum recently, may play an important part in financial inclusion, whether they are digital solutions offered by different financial institutions or organisations operating as non-classical financial institutions (IMF, 2022). The 2020 Financial Stability Report by MNB also supports that the spread of mobile banking applications or online payments, for instance, could promote financial inclusion. However, low digital competence and the lack of internet access excludes many people from their use in Hungary. People should have the necessary preconditions, motivation, attitude, and other characteristics so that the above solutions could effectively support inclusion.

2.3 Demographic features of fintech use

Based on an analysis of the demographic features of fintech users, you can state that services are mostly adopted by younger city-dwellers who are digitally knowledgeable, of higher education, and having regular incomes (Ljumovic et al., 2021). Members of the 18-35 age group are overrepresented among users, as they are more open to new technological solutions and have the necessary digital skills to feel at home in mobile banking or other digital applications. Also, the age group is more risk taker than older people, which underpins their open attitude to new service providers and services (Brahmana–Lau, 2024; Priyadarshi–Prasad, 2025). The level of schooling is also significant: people of higher education do not only understand the operation of digital services better but are also more confident to embrace alternative financial solutions (Ljumovic et al., Handayani-Masaini, 2023).

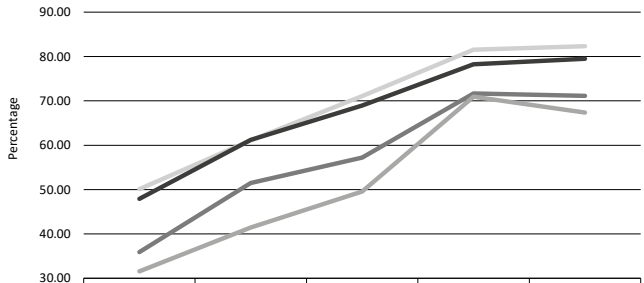
Employment and income levels are also impacting features. People with a regular income make use of loans or investment products or use applications supporting finance management more often (Pradnyani–Putri, 2021). It is interesting that several studies, mainly from Indonesia and Tunisia, have proved that fintech use is increasing among low-income groups too, particularly on platforms such as P2P lending or mobile-based micro-transactions. Its reason is that such services are cheaper, less formalised, and easier to access than traditional banking products. So, as a result of financial inclusion supported by fintech, an increase of use can be observed among lower-income users, too (Handayani–Masdaini, 2023; Brahmana–Lau, 2024). Gender differences continue to be present. Women's share in fintech services is lower partly due to the lack of financial and digital

literacy as well as to social and cultural norms (Amari–Jarboui, 2021; Kandari et al., 2021). Fintech has spread much less to rural communities, which can mostly be explained by the lack of a digital infrastructure and partly by the low level of financial or digital literacy. On the other hand, mobile-based fintech solutions such as mobile banking or QR-coded payments can bridge such rifts provided there is support by society and knowledge transfer (Priyadarshi–Prasad, 2025).

To sum up, the demographic pattern of fintech users is easy to define. However, if services are expanded and digital literacy is improved, financial inclusion can be spread further among social groups that have played a marginal part in the formalised financial system before. In that way, fintech cannot only be interpreted as a technological but also as a social innovation tool.

Studying the information in the Worldbank Financial Inclusion database, you can find that although in 2021 there were major differences between certain social groups in terms of possessing bank accounts, it has almost balanced out by 2024.

Figure 1
Bank account holders in EU

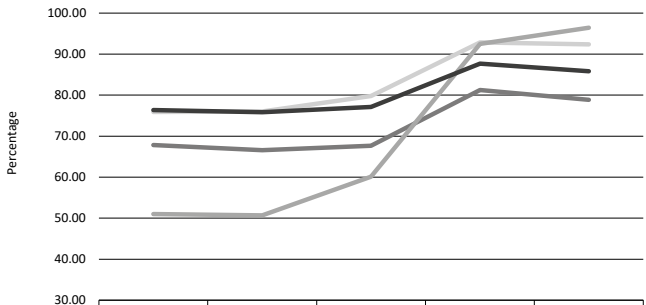


	2011	2014	2017	2021	2024
Holds bank account (poorest 40%)	35.90	51.46	57.23	71.67	71.12
Holds bank account (wealthiest 60%)	50.10	61.11	71.07	81.54	82.33
Account held with bank (aged 15-25)	31.56	41.44	49.58	70.94	67.37
Account held with bank (aged 25+)	47.91	61.17	68.97	78.22	79.49

Source: Own design based on Worldbank database

You get a similar picture if you look at the figures for Hungary in the same database:

Figure 2
Evolution of holding a bank account in Hungary



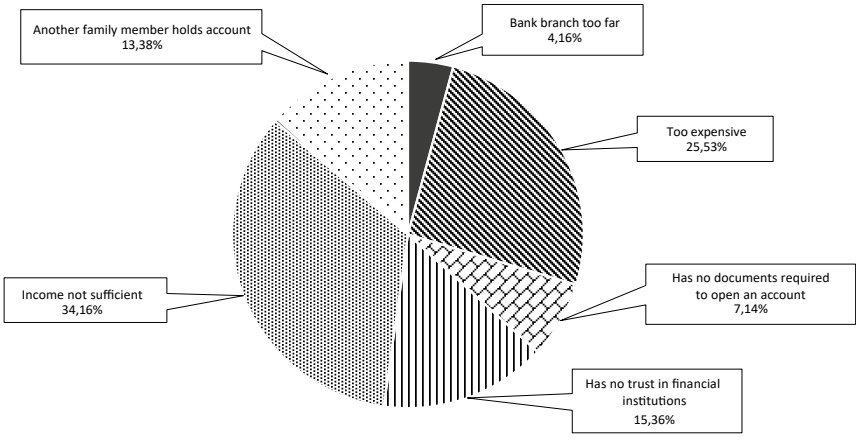
	2011	2014	2017	2021	2024
Holds bank account (poorest 40%)	67.83	66.57	67.67	81.25	78.86
Holds bank account (wealthiest 60%)	75.89	76.04	79.77	92.85	92.36
Account held with bank (aged 15-25)	51.02	50.68	60.09	92.49	96.43
Account held with bank (aged 25+)	76.35	75.83	77.13	87.67	85.81

Source: Own design based on Worldbank database

Hungary is clearly different because young people have the highest share of bank accounts, while youth in the EU are the lowest group of bank account holders. It may partly be because you need a bank account for most digital activities whether it is an order from a mobile phone or subscription to a mobile app. In addition, parents are encouraged to open bank accounts for their children as part of education of financial awareness typically advertised by banks.

In Hungary, the Worldbank survey also covers the reasons why some people do not want /cannot open a bank account. The same figures unfortunately are not available for the EU.

Figure 3
Why people do not hold a bank account



Source: Own design based on World bank database

Figure 3 illustrates the majority do not hold a bank account because they lack suitable income, or because account-related fees are too high compared to their income, i.e., it is too expensive for them. About the same percentage say they either do not trust banks or they share a family account, so they think they do not need to open a separate one for themselves. The above suggests that further financial inclusion could be reached in this country if bank fees were lower and trust in banks was recovered and strengthened.

2.4 Behavioural criteria of adopting fintech innovations

Most research detailed below uses the so termed TAM (technology acceptance model) analysis with respect to the acceptance of fintech innovations. It is the most suitable to find the characteristic features leading users to accept the technologies of fintech services. Let us review the relevant factors so that they can be used as the basis of later analysis.

One of them is *perceived utility,* which means whether or not a technology used will noticeably improve its user's life (Rhu, 2018). It is obviously subject to the technology in question but also to the user's skills (Chang et al., 2016). In addition, perceived utility can mean the time saved by the user, or the feeling of comfort regarding its use, which will all have an impact on the user to decide if they want to continue using a service (Niju–Radhakumari, 2017).

A closely related factor is *the perception of ease of use* which improves user experience. How much a customer feels the use of some technology is easy depends highly on how much the customer is willing to accept a new technology (Chau et al., 2013). In addition to the simplicity of use and perceived utility, *competitive advantage* is also important. It means the sum of positive effects that carry positive characteristics for the user with respect to future use. Ntwiga (2018) studied the factors of competitive advantage of banking services in Taiwan and has found competitive advantages perceived by users had a major impact on future use.

User attitude is another decisive factor regarding users' connection with a technology. It includes both a user's subjective opinion and the measure of personal connection to a certain technology. A cheerful outlook significantly boosts the adoption of a new technology (Gupta–Arora, 2017). *Trust* is a similar minimum requirement of accepting a technology. A user's trust is defined by their internal psychological world, whether or not they are willing to trust a technology. It also contributes to their behaviour *vis a vis* the technology (Kesharwani, 2012).

Willingness to innovate is another decisive factor, which is also part of a user's individual personality and refers to willingness for early acceptance. The more innovative person a user is the more resistance they have to unexpected occurrences appearing as they discover a novelty. They are also more satisfied when discovering something new (Leicht–Chtourou, 2018).

In contrast to the above, *perceived risk* will reduce willingness to use. It is different from financial risk as it rather depends on users' psychological features; what and how much they will experience as risk. At the same time, it means the lack of confidence regarding the acceptance of a technology (Sikdar et al., 2015). Bansai et al., (2010) have concluded that users first of all perceive the risk of abusing or stealing their personal data in connection with fintech technology, so their mistrust in the technology is mainly due to the deficiency of the protection of personal data.

Perceived costs can also have a negative impact on use. Costs are often of primary importance for users compared to individual advantages perceived, so they will not use a service if they regard it as too costly even if its usefulness has been perceived (Venkatesh–Davis, 2000).

Last but not least, a major factor regarding the use of new technologies is whether *users are willing to use them,* if they want to use the technology offered at all. Varga (2017) has concluded the presence of a user's willingness to use a new technology is a factor, which is of primary importance with respect to the use of fintech tools.

User Experience (UX) offered by service providers can support all the above psychological and attitudinal characteristics. According to its definition by ISO 9241-210, UX is an umbrella term to describe the feelings, beliefs, preferences, physical and psychological responses, behaviours, and performance-related perceptions

born when persons and the system interact. However, according to the definition by Hassenzahl (2008), UX is not simply the issue of efficiency and usefulness, but it can trigger emotional states that reinforce a user's connection with a product.

UX well executed can promote the acceptance of digital financial services through its positive user experience. Simple and intuitive platforms reduce the barriers of entry particularly for less educated or digitally less skilled users (Haque–Sultana, 2025). By optimising user experience, for instance of mobile banking or mobile wallet services can increase regular use, strengthen users' loyalty, and have a beneficial effect on future transformation of financial habits (Goyat–Nandal, 2025). Improving user experience can affect confidence with financial service providers, too. A feeling of technological reliability, data protection and transparency will increase acceptance (Putra-Anggraeni, 2025). Well targeted UX actions can reduce the gap between genders, age groups, or geographical regions (Thanajaro–Hattakitpanitchakul, 2025).

Next, let us examine with the help of a questionnaire survey the characteristic features and attitudes of use that can be identified among Hungarian users.

3 METHODOLOGY

The sample used in this study has been provided by an omnibus-type online questionnaire under the project 'From Talent to Young Researcher' (EFOP-3.6.3.-VE-KOP-16-2017-00007) conducted at the University of Pécs. For this, a third-party market research company took a 1000-people strong representative sample of the adult population of Hungary (18–25-year-old).

The questionnaire included questions of risk rating as under MiFID in compliance with Act CXXXVIII of 2007 on investment firms and commodity exchange service providers and the rules governing their activities. The objective is to link respondents' risk-taking capacity to the use of individual products. The second group of questions focused on what services are known to and used by respondents.

The third section of the questionnaire included statements measured on the Likert scale. They related to users' attitude towards fintech services and how they use them. For instance, statements to be assessed related to the reliability of services, the simplicity of their use and how much their use is liked. Finally, there were questions on demographic characteristics, such as gender, age, family status, highest level of education, business activity, and its sector, as well as self-reported income (the full questionnaire is attached to the study in *Annex 1*).

Firstly, the data of descriptive statistics were presented.

Next, on the basis of the statistical methodology analysis by Zaman et al., (2020) two factors were designed in accordance with the data received from the statements to be assessed on the five-grade Likert scale. The two factors can describe two characteristic mindsets the users consistently apply when using a service. Principal component analysis was used to design the two mindsets. It means that multiple correlated variables are transformed into a lower number of uncorrelated variables. In order to identify the adequacy of the factors, you need to analyse the changes of the model's explanatory power, the Kaiser-Meyer-Olkin (KMO) value and to execute the relevant Bartlett test. The former shows the adequacy of the factors while the latter checks whether or not the pairs of variables received were uncorrelated (Jánosa, 2023). Since our factors had met the criteria, they were used further in the cluster analysis to set up identifiable forms of behaviour.

In the next step, behavioural groups of users were identified by means of k-means clustering. Their optimal number should be identified by selecting the K number of group-means, assigning event points to them and then recalculate the coordinates of the centre points assigning the events to the new centre point. The steps are repeated until standstill is reached, which in our case means the composition of the groups no longer changes. The values received by cluster analysis can be interpreted if the cluster centre-point values in the Final Cluster Centres table are examined. In that way, you obtain a picture of the nature of different groups, since the different data points within the cluster gather around the central values. In other words, you can explain the characteristics of the elements within each cluster using those values.

To be able to present our findings in more detail, cross-tables were used within the clusters to see the appearance of different demographic features. It showed how the different demographic features appeared within the different clusters. The most frequently applied Pearson's Chi-square probe was used for analysing the cross tables. The Chi-square probe can show if there is a connection between two variables, in this case, between a given demographic factor and its belonging to the cluster. According to the null hypothesis of the probe, the two variables are independent of each other. According to the alternative hypothesis, there is a connection between them (Sajtos–Mitev, 2007). The cross tables are valuable as you can use them to describe the types of behaviour to be expected of certain demographic groups.

4 FINDINGS AND EVALUATION

4.1 Demographic characteristics

First, you should use descriptive statistical methods to see what kind of conclusions can be drawn from the pattern received. *Table 1* is a summary of respondents' statistical characteristics

Table 1
Respondents' statistical characteristics

	Name	No	Percentage
Gender	Female	530	53
	Male	470	47
Age	18 – 29	180	18
	30 – 44	280	28
	45 – 64	330	33
	65 +	210	21
Region	Central Hungary	300	30
	Central Transdanubia	110	11
	Western Transdanubia	100	10
	Southern Transdanubia	90	9
	Northern Hungary	120	12
	Northern Great Plain	150	15
	Southern Great Plain	130	13
Education, qualifications	8 classes of primary/elementary school	20	2
	Vocational school	87	8.7
	Vocational secondary school, school-leaving exam	201	20.1
	High school graduate	143	14.3
	Technical College degree	87	8.7
	College degree	228	22.8
	University degree	234	23.4
Family status	Single	178	17.8
	Married	508	50.8
	Divorced	81	8.1
	Widow/widower	53	5.3
	Lives in a partnership	180	18

	Name	No	Percentage
Business activity	Active blue-collar worker	200	20
	Active white-collar worker	394	39.4
	Self-employed/entrepreneur	37	3.7
	Receives child-care assistance, or child-care allowance	49	4.9
	Housewife	15	1.5
	Student	17	1.7
	Pensioner	235	23.5
	Unemployed	18	1.8
	Other inactive breadwinner	6	0.6
	Other dependent	1	0.1
	I don't know / I don't answer	28	2.8
Income position	Live well on income and can also save some of it.	127	12.7
	Can live on it but can save a little only	450	45
	Just enough to live on, no savings	262	26.2
	Sometimes it is not quite enough to live on	47	4.7
	Has regular, daily problems of living	18	1.8
	I don't know / I don't answer	96	9.6

Source: own design

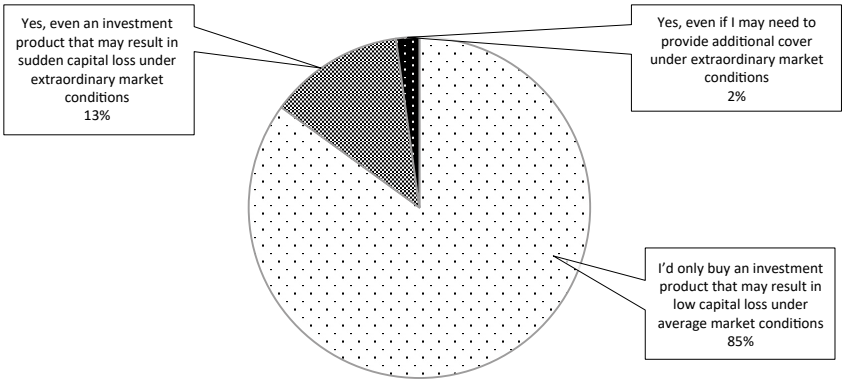
To interpret *Figure 1,* one should note the research has been representative in terms of gender, age, and type of location, so the information relating to those characteristics can be regarded to be generally valid. On the other hand, demographic features in the research cannot be generalised because of their non-representative nature. Degree holders and people with school leaving exam from vocational secondary schools made up the majority of respondents with a percentage of twenty each. That may distort our findings related to the connection between education/qualifications and use of fintech. Most respondents are married, although family status was not part of the research later on, as it is less decisive of the research area to be studied.

With regard to business activity, most respondents are white-collar workers followed by pensioners and blue-collar workers. That is worth noting as the high ratio of pensioners will probably distort the characteristics of fintech use because of the low level of their digital skills. Other activity categories make up 18% of the total number of respondents.

In terms of income, however, the majority can not only live on their income but can also save some of it. They are followed by those who can live on it but cannot save, and then by the self-admitted high earners. Needy families, who would be most affected by financial exclusion, hardly appear in the sample. It may be due to the online completion of the questionnaire, which meant poorer groups had no access to it. One should not forget here about a socially desirable distortion well known in psychology. The theory describes that in the case of a questionnaire-based research respondents are liable to give the answers socially expected or regarded to be positive whether or not they are true. It often leads to an overestimation of knowledge, behaviour, or status with self-completed questionnaires, particularly if sensitive or high-value topics are involved (Paulhus, 1984; Krumpal, 2013). Therefore, one should not draw general conclusions from self-admitted data related to income.

Before going on to the questions on fintech services, one should take a glimpse of respondents' willingness to take risks. The question has been transferred into the questionnaire from the MiFID questionnaire the completion of which is mandatory if you buy investment products. The question is aimed at assessing investors' risk-taking willingness and ability to suffer a loss. The responses given show that the significant majority of respondents (85%) are highly risk averse. 13% are willing to take minor risks/loss and a mere 2% are willing to take a major risk.

Figure 4
Respondents' risk-taking willingness based on question transferred from MiFID questionnaire

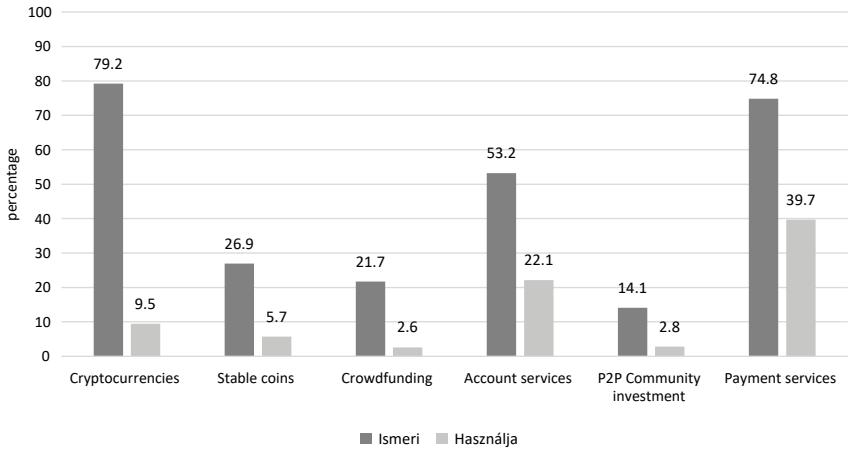


Source: own design

4.2 Knowledge and use of fintech services

Regarding fintech services, most respondents know, or at least have heard about, cryptocurrencies and payment services; account services are less known, while stable coins, crowdfunding or P2P lending as community services are hardly known. One should note here that the use of the services said to be known by the majority is rather low. For instance, most people have heard about cryptocurrencies but only 9.5% said they used them. It is also true for payments, which is second best known, but only 39.7% of the respondents said they were using them. The conclusion can be drawn that the use of fintech services is fairly low in this country.

Figure 5
Distribution of knowledge and use of fintech services

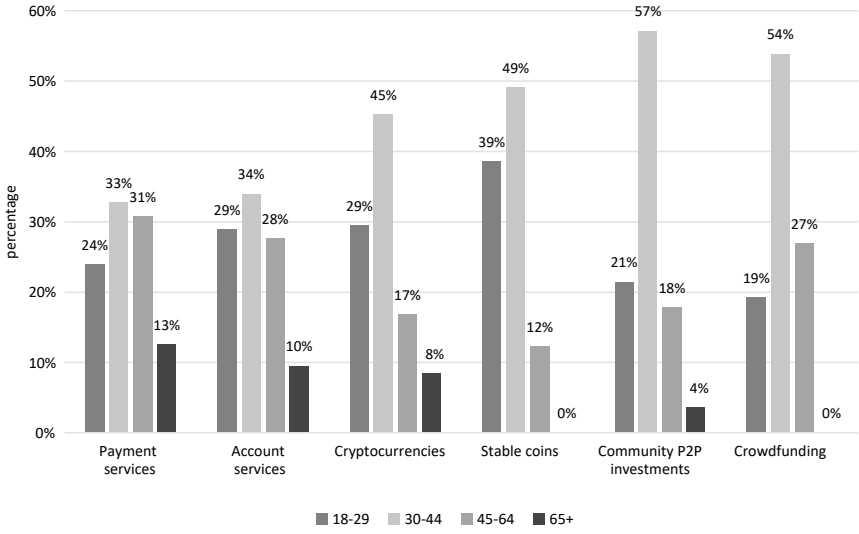


Source: own design

In terms of knowledge and use, one should break down the information received by demographic characteristics. It is done by presenting the demographic features of respondents giving yes (positive) answers.

First, age groups are taken one by one. It is clear in terms of usage that the age group aged 30–44 are the most numerous for all categories, although payments and account services are popular among people a category younger and a category older as well. For cryptocurrencies and stable coins, youth make up the second largest group of users.

Figure 6
Use of fintech services by age groups

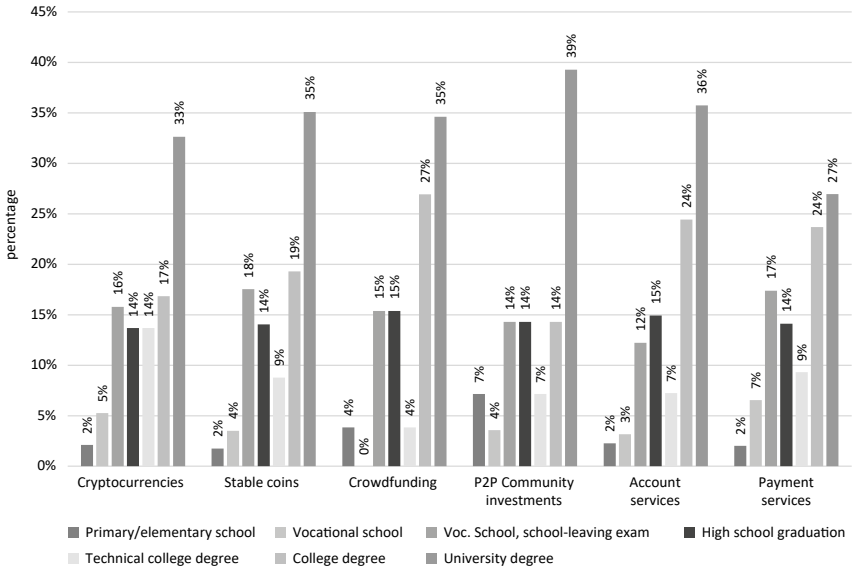


Source: own design

As for age groups, one can say that relatively younger but not the youngest people use such services. It might be because you are typically thirty by the time you reach a proper position in life to use fintech products, so they are the ones appearing as users.

As the level of schooling/education increases, the use of fintech tools increases too. For all services, the largest groups are made up of people holding a university or college degree. It may be because they are the ones who can understand the use of more sophisticated products and are more confident using them.

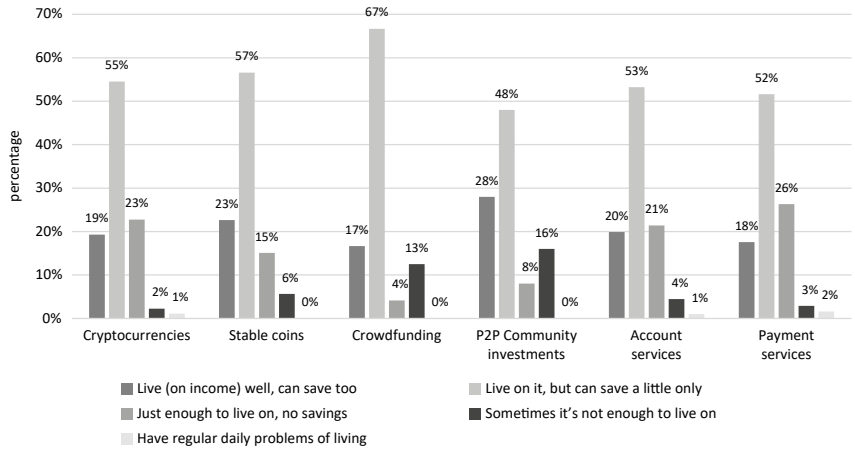
Figure 7
Use of fintech services by level of schooling/education



Source: own design

Finally, it is worth analysing use based on self-admitted income position. Rather than people placing themselves in the best income category, those come in first significantly preceding other categories in terms of using fintech services who have said 'they can live on their income and can save a little'. It might be because fintech services typically operate at more favourable fees and offer higher interests than most financial service providers. The option of higher profit is particularly true for cryptocurrencies and stable coins. In addition, it is attractive that investors can select themselves what they want to finance from the investments in the case of crowdfunding and P2P community investments.

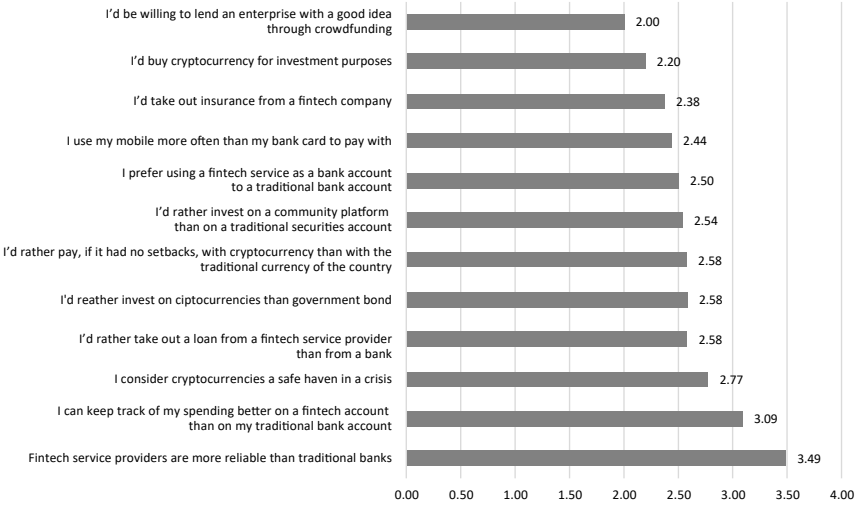
Figure 8
Use of fintech services by income position



Source: own design

Continuing to the next part of the questionnaire, you can see multiple relevant findings among the statements to be assessed by the five-degree Likert scale.

Figure 9
Findings of the analysis of characteristics of attitude and opinion



Source: own design

Analysing the averages of the answers given, an interesting picture of users' attitudes appears. The highest point was reached by the statement, 'fintech service providers are more reliable than banks.' It can partly suggest that users do not have enough experience about the whole risk spectrum of those services, while on the other hand it can also indicate that the 2008 crisis and the issues around foreign currency loans, which have been unresolved for a long time in this country, have shattered confidence in banks. The statement producing the third highest average is similarly surprising. According to it, people regard crypto tools to be safe-haven currencies in the event of a crisis. This may mean they consider crypto tools more resistant to crises than governments and their bonds or currencies. Distrust of banks is also supported by the fact that people would rather take a loan from a fintech service provider than from a bank. In addition, they would prefer using cryptocurrencies and investing on fintech platforms compared to traditional solutions. However, one should remember that the averages of assessment, except for reliability, are around the mean value, i.e., about fifty percent of respondents agree with them.

4.3 Identifiable patterns of mindset and behaviour

In order to be able to identify patterns of behaviour by cluster analysis, one had to see if there are connections between answers given to the statements assessed with the Likert scale. For that, a correlation matrix of the statements was prepared. It was found there was medium-strong correlation among the assessment of multiple statements. (*Annex 2* includes the whole correlation matrix.) Based on the above it was decided to create factors from the statements applying principal component analysis to receive uncorrelated groups that are more suitable for further analysis.

To find if the principal component analysis is valid, the value of the Kaiser-Meyer-Olkin (KMO) indicator was taken into attention. According to its value of 0.941, the data series met the requirements of factor analysis at a high level. In addition, the value of the Bartlett test was 0.000, so it proves the factors received are acceptable. *Figure 2* includes the factors created. The outputs received can be found in *Annex 3*.

Table 2
Content of factors created

Factors provided by principal component analysis	
intent of use	**competitive advantage**
I'd be willing to purchase cryptocurrency for investment	I consider cryptocurrencies to be a safe haven in case of crises
I would lend an enterprise with a good idea through crowdfunding.	FinTech service providers are more reliable than traditional banks.
I would take out insurance from a FinTech company.	I would rather take a loan from a FinTech service provider than from a bank.
I use my mobile more often than my bank card to pay with.	I prefer using Transferwise /Revolut / other services to be using a traditional bank account.
	I can keep track of my spending more with Revolut than on my traditional bank account.
	I would rather invest into crypto instruments than government bonds.
	I would rather invest on a community platform than on a traditional securities account.
	I would rather pay with cryptocurrency, provided it had no setbacks, than with the official currency of the country.

Source: own design

The first factor was named *intent of use* in accordance with the relevant literature since it is more linked to use. The statements in the other factor tended to include statements linked to better, safer, and other advantages, so, in accordance with literature terminology, it was named the group of *competitive advantage*.

Using the two factors, cluster groups were set up for expected patterns of behaviour, which were then designed using k-means clustering. Several versions were produced to select the suitable cluster number, then the version with the content leading to the most logical and easy interpretation was selected. The objective was to achieve that the selected clusters describe the groups according to the two patterns of behaviour so that they could be easy to name intuitively. The clusters designed are presented in *Table 3,* while the output of the cluster analysis is in *Annex 4* to the study.

Table 3
Cluster centres of clusters developed

	Adverse	Averse	Supportive	Rational innovators
Competitive advantage	–0.86	1.01	1.16	–0.25
Intent to use	–0.33	–0.89	1.88	0.81

Source: own design

Members of the first group both fail to see the advantages of the technology, nor do they have an intent to use, so they were named *Adverse*. Members of the second group recognise the advantages of the technology but have no intent to use it, so they are *Averse*. Members of the third group are aware of the advantages and have an intent to use, so they are *Supportive*. Finally, there is a group the members of which do not necessarily have a positive view of the competitive advantages, still they use the services, so they are *Rational Innovators*. They are aware of the risks. nevertheless, they use the services.

4.4 Spread of demographic characteristics in different clusters

Before analysing the distribution of different demographic variables within the clusters, one should find if there are significant differences between the categories belonging to each of them. First, analysis ANOVA was used to reveal such differences. In it, independent variables are made up by demographic characteristics, while dependent variables are the four clusters to decide which variables should undergo further detailed analysis.

Table 4
Differences of demographic characteristics by clusters

ANOVA					
Demographic characteristics	**sum of squares**	**Df**	**average**	**value F**	**value p**
Gender	9.76	3	3.25	13.54	0.0000
Age group	74.13	3	24.71	25.88	0.0000
Income position	51.08	3	17.03	9.53	0.0000
Highest level of schooling / education	32.23	3	10.74	3.40	0.0173
Family status	8.13	3	2.71	1.51	0.2088
Business activity	42.14	3	14.05	1.92	0.1243
Region	17.57	3	5.86	1.17	0.3163

Source: own design

You can see from the ANOVA table that gender, age, income position, and schooling / education exhibit significant differences within the cluster groups. On the other hand, family status, business activity, or region show no differences at 5% significance level.
Table 5 illustrates distribution by gender

Table 5
Differences by gender

		Adverse	Averse	Supportive	Rational innovators	Total
Female	**Number**	**201**	181	61	87	530
	% row	**38%**	34%	12%	16%	100%
Male	**Number**	**196**	94	42	138	470
	% row	**42%**	20%	9%	29%	100%
Total	**Number**	**397**	275	103	225	1000
	% row	**40%**	28%	10%	23%	100%

Source: own design

Cross table 5 illustrates – according to the chi-square probe – there is connection between belonging to the cluster and gender as a demographic characteristic. (Outputs of the chi-square probes belonging to the cross table are in *Annex 5*.) Thus, in summary, you can say most respondents belong to the category of Adverse, therefore it is no surprise that it is the largest group both for men and women. The distribution by gender is more interesting in the second and third largest groups, i.e., Averse and Rational innovators. Women are typically in the Averse group – they are aware of the advantages of the technology, still they refrain from using it. Compared to that, there are more men among Rational innovators. They are the ones that typically use the technology although they are somewhat sceptical about its competitive advantage.

Table 6
Difference of age groups

		Adverse	Averse	Supportive	Rational innovators	Total
18 – 29	**Number**	56	33	17	**74**	180
	% row	*31%*	*18%*	*9%*	**41%**	*100%*
30 – 44	**Number**	**92**	74	34	80	280
	% row	**33%**	*26%*	*12%*	*29%*	*100%*
45 – 64	**Number**	**147**	105	26	52	330
	% row	**45%**	*32%*	*8%*	*16%*	*100%*
65 +	**Number**	**102**	63	26	19	210
	% row	**49%**	*30%*	*12%*	*9%*	*100%*
Total	**Number**	**397**	275	103	225	1000
	% row	**40%**	*28%*	*10%*	*23%*	*100%*

Source: own design

According to the chi-square probe, one can see there is correspondence between belonging to the cluster and the variable. In this case, the group of Adverse is the strongest in all 30+ age groups. As for the younger ones (18-29), most of them belong to Rational innovators, while it is the second largest in the next age group (30-44). As you progress towards older age groups, the group of Adverse is first and that of Averse is second by size. It means those people do not use the technologies even if they are aware of their advantages. It supports the statement found in the literature, in the part relating to demographic characteristics, i.e., young people are the most open to fintech solutions and they use them most.

Table 7
Distribution by income position

		Adverse	Averse	Supportive	Rational innovators	Total
Live well on income and can also save some of it	**Number**	**59**	26	5	37	127
	Can live on it but can save a little only	***46%***	*20%*	*4%*	*29%*	*100%*
Can live on it but can save a little only	**Number**	**175**	116	45	114	450
	Sometimes it is not quite enough to live on	**39%**	*26%*	*10%*	*25%*	*100%*
Just enough to live on, no savings	**Number**	**112**	84	23	43	262
	Total	***43%***	*32%*	*9%*	*16%*	*100%*
Sometimes it is not quite enough to live on	**Number**	**15**	13	5	14	47
	% row	***32%***	*28%*	*11%*	*30%*	*100%*
They have regular, daily problems of living	**Number**	**6**	**6**	4	2	18
	% row	***33%***	***33%***	*22%*	*11%*	*100%*
Total	**Number**	**397**	275	103	225	1000
	% row	***40%***	*28%*	*10%*	*23%*	*100%*

Source: own design

As you can see the two variables are not independent of each other with respect to the income groups, either. Irrespective of their income group, the number of Adverse is the highest in each group. In addition, it is no surprise that Rational innovators make up the second largest part in the group of the well-to-do, as they are the ones holding savings to be invested into riskier projects. On the other hand, it is interesting that the same holds for those who said their income was sometimes not enough to live on. The reason in their case might be that fintech service providers often offer cheaper services than banks, even free of charge in many cases, which makes them attractive for the poor. Regarding income position, one should remark that the above statements cannot be generalised for the whole society in Hungary, since the research was not representative in that respect, further, the poor are quite under-represented in the sample.

Table 8
Distribution by schooling/education

		Adverse	Averse	Supportive	Rational innovators	Total
8 classes of primary/ elementary school	**Number**	7	**9**	1	3	20
	% row	*35%*	***45%***	*5%*	*15%*	*100%*
Vocational school	**Number**	**30**	20	19	18	87
	% row	***34%***	*23%*	*22%*	*21%*	*100%*
Vocational secondary school, school-leaving exam	**Number**	76	68	22	35	201
	% row	***38%***	*34%*	*11%*	*17%*	*100%*
High school graduate	**Number**	**49**	41	12	41	143
	% row	***34%***	*29%*	*8%*	*29%*	*100%*
Technical College degree	**Number**	**33**	23	8	23	87
	% row	***38%***	*26%*	*9%*	*26%*	*100%*
College degree	**Number**	**108**	56	20	44	228
	% row	***47%***	*25%*	*9%*	*19%*	*100%*
University degree	**Number**	**94**	58	21	61	234
	% row	***40%***	*25%*	*9%*	*26%*	*100%*
Total	**Number**	**397**	275	103	225	1000
	% row	***40%***	*28%*	*10%*	*23%*	*100%*

Source: own design

Finally, the level of schooling /education is the last indicator with significant differences. At 5% significance level, it can be agreed there is a connection between belonging to the cluster and the level of schooling/education. You can see here that the number of Averse (and not that of Adverse) is the highest in the group with the lowest level of education. In other words, they are wary, nevertheless, the solutions can be attractive for them, and they focus more on the advantages than people with a higher level of education. In addition, the ratio of the Averse and Rational innovators is equal in the group having a high school certificate. It suggests those groups do perceive the usefulness of the technologies.

To sum up, the findings of the survey suggest the group of the Adverse is the largest for most demographic characteristics. It indicates the Hungarian population is less open to fintech solutions. In most cases there is similarity with the trends in earlier literature, however, there are surprising deviations in terms of income position and the level of education. The ratio of users is insignificant among the

well-to-do. Also, it has not been proved if a higher level of education matches a higher rate of use.

5 SUMMARY

One can say the objective of the study has been reached. The demographic characteristics of Hungarian fintech users have been presented. Next, mindsets have been identified by the factor analysis of attitude-related questions, then the attitudes related to fintech use have been identified by the cluster analysis of the factors. In addition, the distribution of different demographic characteristics with the attitude groups set up has also been described.

In the theoretical part, the typical definitions of fintech have been reviewed. After discussing the difficulties of an exact definition, the history of the development of fintech and its future challenges have been reviewed as well as the concept and characteristic features of financial exclusion in this country and globally, further, the demographic and attitude features of fintech use.

The findings of the empirical research suggest that most fintech services are unknown in this country, or few people use the services and tools even if they are known. It has also become obvious that, despite its relatively low level of awareness, trust in fintech services is higher than in traditional banks. Finally, two factors were created from the statements assessed on a five-grade scale. One of them represented *intent to use* and the other *perceived competitive advantages*. Four behavioural groups could be identified by means of the factors. The cross-table analysis with demographic features has helped to reveal the patterns of behaviour characterising the different groups.

In summary, one can state young people (under 30) are the most receptive to fintech solutions, which corresponds to the findings of the literature. Regarding other factors, however, the responses in the sample suggest that the majority are Adverse. Thus, in this country openness to fintech solutions is low.

From a policy aspect, the authors can offer the following advice: continue strengthening financial education and financial awareness and popularise digital skills. On the other hand, it is obvious that the fintech hub and sandbox of the MNB continue to be important to support fintech companies and initiatives. The continued development of digital citizenship and open banking technology is expected to make a positive impact on installing and popularising additional digital services.

In addition to underlining the importance of the relevant policies, it should be noted the ways the banks and other, non-bank fintech service providers design

their products, such as mobile apps and other services plays a crucial part too. In that regard, development using the customers' point-of-view is of primary importance, for instance, the use of the empathy map and customer journey when ideas are proposed. Later on, the proper use of UX, security systems promoting confidence, the installation of easy-to-use and clear platforms to increase perceived utility should be offered. It is important to emphasise that policy support and corporate-level development efforts should go hand in hand to boost and popularise use and to attract individuals who used to believe such applications were risky to join the field.

Finally, the limitations of the study and further potential research directions should be briefly mentioned. In terms of the study, one should note that although the part played by fintech in financial inclusion has been touched upon, the poorest societal groups are missing from the sample because of the questionnaire type of the research. Another method should be used to study that part of the Hungarian population, for instance, using focus groups or questionnaires completed in person with the help of interviewers. To receive a more detailed picture of motivations, speaking to different groups in smaller units, for instance, by in-depth interviews or focus groups could be an interesting direction of further research.

ANNEXES

1 Annex 1

Questionnaire used

Questionnaire applied for the query

1. Risk rating as per the MiFID questionnaire: Are you willing to buy a higher-risk product in the hope of higher return?

1) I'd only buy an investment product that would allow a lower risk of capital loss under average market conditions (e.g., investment fund shares, bonds, or shares).
2) Yes, even investment products that may led to a sudden loss of the total funds invested under unforeseen market conditions, but the loss cannot go beyond the original investment (e.g., warrant, long option.)
3) Yes, even under an investment transaction where I may not only lose the funds invested into the product, but I might be required to provide additional funds (e.g., deferred payment, Lombard loan, futures transaction, securities loan, or short sale).

2. Have you heard about or used any of the FinTech solutions below?

	Heard about it	Used it	Has not heard about or used it
cryptocurrencies (e.g., Bitcoin)			
stable coins (e.g., Ethereum)			
crowdfunding			
account services (e.g., Transferwise, Revolut)			
community investment services (e.g., eToro)			
payment services (e.g., GooglePay)			

3. Please, mark how much the following statements are true for you (1 - not true at all, 5 - fully true)

a) I'd be willing to purchase cryptocurrency for investment
b) I consider cryptocurrencies to be a safe haven in case of crises
c) FinTech service providers are more reliable than traditional banks.
d) I would rather take a loan from a FinTech service provider than from a bank.

e) I prefer using Transferwise /Revolut / other services to be using a traditional bank account.
f) I can keep track of my spending more with Revolut than on my traditional bank account.
g) I would rather invest into crypto instruments than into government bonds.
h) I would rather invest on a community platform than on a traditional securities account.
i) I would lend an enterprise with a good idea by means of crowdfunding.
j) I would take out insurance from a FinTech company.
k) I would rather pay with cryptocurrency, provided it had no setbacks, than with the official currency of the country.
l) I use my mobile more often than my bank card to pay with.

Respondent's

Gender

1 – male
2 – female

How old are you?

Family status?

1 – single
2 – married
3 – divorced
4 – widow/widower
5 – lives in a partnership

What is your highest level of schooling/education successfully completed?

1 – 8 classes of primary/elementary school
2 – vocational school
3 – vocational secondary school, school-leaving exam
4 – high school graduation
5 – technical college
6 – college degree
7 – university degree

How would you assess your family's net monthly income?

1 – They live well on it; they can also save some of it.
2 – They can live on it, but they can save a little only
3 – Just enough to live on, no savings
4 – Sometimes it is not quite enough to live on
5 – They have regular, daily problems of living
0 – does not know / does not answer

Where would you place yourself in terms of business activity?

1 – Active blue-collar worker
2 – Active white-collar worker
3 – On childcare leave / childcare allowance → *Questionnaire ended*
4 – Housewife → *Questionnaire ended*
5 – Student → *Questionnaire ended*
6 – Pensioner → *Questionnaire ended*
7 – Unemployed → *Questionnaire ended*
8 – Other inactive breadwinner → *Questionnaire ended*
9 – Other dependent → *Questionnaire ended*
0 – Does not know / does not answer → *Questionnaire ended*

What sector are you employed in?

1 – agriculture, forestry, fishing
2 – mining, quarrying
3 – processing industry
4 – electricity, gas, steam supply, air conditioning
5 – water supply
6 – construction industry
7 – commerce, vehicle repair
8 – transportation, storage
9 – accommodation and food services
10 – information and communication technology
11 – finance, insurance
12 – property transactions
13 – professional, scientific, technical activities
14 – administrative and service support activities
15 – public administration, defence
16 – education
17 – human healthcare, welfare services
18 – arts, entertainment, leisure activities
19 – other services
0 – Does not know / does not answer

Annex 2
Correlation matrix on Likert-scale questions

	I'd be willing to purchase / I have purchased cryptocurrency for investment	I consider cryptocurrencies to be a safe haven in case of crises	FinTech service providers are more reliable than traditional banks.	I would rather take out a loan from a FinTech service provider than from a bank.	I prefer using Transferwise / Revolut / other services to be using a traditional bank account.	I can keep track of my spending more with Revolut than on my traditional bank account.	I would rather invest into crypto instruments than into government bonds.	I would rather invest on a community platform than on a traditional securities account.	I would lend an enterprise with a good idea by means of crowdfunding.	I would take out insurance from a FinTech company.	I would rather pay with cryptocurrency, provided it had no setbacks, than with the official currency of the country.
I'd be willing to purchase / I have purchased cryptocurrency for investment	1										
I consider cryptocurrencies to be a safe haven in case of crises	,502**	1									
FinTech service providers are more reliable than traditional banks.	,328**	,489**	1								
I would rather take out a loan from a FinTech service provider than from a bank.	,501**	,453**	,488**	1							
I prefer using Transferwise / Revolut / other services to be using a traditional bank account.	,519**	,489**	,401**	,518**	1						
I can keep track of my spending more with Revolut than on my traditional bank account.	,409**	,443**	,524**	,454**	,541**	1					
I would rather invest into crypto instruments than into government bonds.	,630**	,560**	,425**	,531**	,534**	,431**	1				
I would rather invest on a community platform than on a traditional securities account.	,532**	,528**	,432**	,579**	,529**	,427**	,660**	1			
I would lend an enterprise with a good idea through crowdfunding.	,641**	,438**	,312**	,516**	,516**	,393**	,520**	,503**	1		
I would take out insurance from a FinTech company.	,569**	,492**	,430**	,522**	,532**	,465**	,552**	,539**	,638**	1	
I would rather pay with cryptocurrency, provided it had no setbacks, than with the official currency of the country.	,538**	,552**	,465**	,498**	,514**	,457**	,602**	,544**	,477**	,495**	1
I use my mobile more often than my bank card to pay with.	,418**	,228**	,167**	,349**	,390**	,272**	,332**	,317**	,414**	,344**	,336**

**. Correlation is significant at level 0.01 (2-tailed).

Annex 3

Factor outputs

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.941
Bartlett's Test of Sphericity	Approx. Chi-Square	6028.386
	df	66
	Sig.	0.000

Communalities		
	Initial	**Extraction**
Please, mark how much the following statements are true for you – I'd be willing to purchase / I have purchased cryptocurrency for investment	1.000	0.674
Please, mark how much the following statements are true for you – I consider cryptocurrencies to be a safe haven in case of crises	1.000	0.583
Please, mark how much the following statements are true for you – FinTech service providers are more reliable than traditional banks	1.000	0.698
Please, mark how much the following statements are true for you – I would rather take out a loan from a FinTech service provider than from a bank	1.000	0.556
Please, mark how much the following statements are true for you – I prefer using Transferwise /Revolut / other services to be using a traditional bank account	1.000	0.568
Please, mark how much the following statements are true for you – I can keep track of my spending more with Revolut than on my traditional bank account	1.000	0.542
Please, mark how much the following statements are true for you – I would rather invest into crypto instruments than into government bonds	1.000	0.632
Please, mark how much the following statements are true for you – I would rather invest on a community platform than on a traditional securities account	1.000	0.597
Please, mark how much the following statements are true for you – I would / I have lent an enterprise with a good idea through crowdfunding	1.000	0.670
Please, mark how much the following statements are true for you – I would take out / have taken out insurance from a FinTech company	1.000	0.598

Communalities		
	Initial	**Extraction**
Please, mark how much the following statements are true for you – I would rather pay with cryptocurrency, provided it had no setbacks, than with the official currency of the country	1.000	0.578
Please, mark how much the following statements are true for you – I use my mobile more often than my bank card to pay with	1.000	0.588
Extraction Method: Principal Component Analysis.		

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.257	52.139	52.139	6.257	52.139	52.139	3.931	32.761	32.761
2	1.028	8.568	60.707	1.028	8.568	60.707	3.354	27.947	60.707
3	0.754	6.285	66.992						
4	0.620	5.164	72.156						
Extraction Method: Principal Component Analysis.									

Rotated Component Matrix[a]		
	Component	
	1	2
Please, mark how much the following statements are true for you – I'd be willing to purchase / I have purchased cryptocurrency for investment	0.382	0.727
Please, mark how much the following statements are true for you – I consider cryptocurrencies to be a safe haven in case of crises	0.707	0.288
Please, mark how much the following statements are true for you – FinTech service providers are more reliable than traditional banks	0.835	0.004
Please, mark how much the following statements are true for you – I would rather take out a loan from a FinTech service provider than from a bank	0.586	0.461
Please, mark how much the following statements are true for you – I prefer using Transferwise /Revolut / other services to be using a traditional bank account	0.541	0.524
Please, mark how much the following statements are true for you – I can keep track of my spending more with Revolut than on my traditional bank account	0.705	0.213
Please, mark how much the following statements are true for you – I would rather invest into crypto instruments than into government bonds	0.585	0.539

Rotated Component Matrix[a]		
	Component	
	1	2
Please, mark how much the following statements are true for you – I would rather invest on a community platform than on a traditional securities account	0.601	0.485
Please, mark how much the following statements are true for you – I would lend / I have lent an enterprise with a good idea through crowdfunding	0.321	0.753
Please, mark how much the following statements are true for you – I would take out / have taken out insurance from a FinTech company	0.507	0.584
Please, mark how much the following statements are true for you – I would rather pay with cryptocurrency, provided it had no setbacks, than with the official currency of the country	0.625	0.433
Please, mark how much the following statements are true for you – I use my mobile more often than my bank card to pay with	–0.008	0.767
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]		
a. Rotation converged in 3 iterations.		

Annex 4

Cluster outputs

Iteration History[a]				
Iteration	Change in Cluster Centers			
	1	2	3	4
1	0.446	0.867	0.667	1.007
2	0.156	0.334	0.232	0.249
3	0.098	0.130	0.098	0.104
4	0.058	0.047	0.075	0.073
5	0.019	0.021	0.078	0.040
6	0.016	0.004	0.012	0.028
7	0.019	0.007	0.009	0.025
8	0.005	0.004	0.018	0.009
9	0.028	0.000	0.000	0.050
10	0.025	0.006	0.000	0.047
[a] Iterations stopped because the maximum number of iterations was performed. Iterations failed to converge. The maximum absolute coordinate change for any center is ,047. The current iteration is 10. The minimum distance between initial centers is 2,870.				

Final Cluster Centers				
	Cluster			
	1	2	3	4
Confidence factors	–0.85638	1.00975	1.16187	–0.25499
Usage factors	–0.32655	–0.89365	1.87874	0.80838

Number of Cases in each Cluster		
Cluster	1	397.000
	2	275.000
	3	103.000
	4	225.000
Valid		1000.000
Missing		0.000

Annex 5

Chi-square Tests of Cross Tables

Differences by gender – Chi-square test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	39.193[a]	3	0.000
Likelihood Ratio	39.649	3	0.000
Linear-by-Linear Association	6.908	1	0.009
N of Valid Cases	1000		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 48.41.

Differences by gender – Chi-square test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	80.761[a]	9	0.000
Likelihood Ratio	81.484	9	0.000
Linear-by-Linear Association	59.956	1	0.000
N of Valid Cases	1000		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.54.

Distribution by income position – Chi-square test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	43.404[a]	15	<.001
Likelihood Ratio	42.050	15	<.001
Linear-by-Linear Association	.000	1	.983
N of Valid Cases	1000		

a. 4 cells (16.7%) have expected count less than 5. The minimum expected count is 1.85.

Distribution by education/qualifications – Chi Square test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	34.381[a]	18	0.011
Likelihood Ratio	31.268	18	0.027
Linear-by-Linear Association	0.136	1	0.713
N of Valid Cases	1000		

a. 2 cells (7.1%) have expected count less than 5. The minimum expected count is 2.06.

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