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## RESEARCH ARTICLE

# Determinants of FinTech Adoption Among Gen Z Females: A Study in Hungary

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**Abstract** – FinTech banking solutions offer a valuable set of technological tools that can be used to improve sustainability. Therefore, consumer acceptance and applicability of FinTech solutions is an important issue, especially among Generation Z, as this age group represents a relevant segment of future consumers. According to studies, men have a more positive attitude towards technology adoption than women. It is important to understand the mindset of women in this context, and this paper focuses on them to analyse the key determinants of FinTech service usage. Therefore, the objective of this analysis is to examine the attitudes of Generation Z women in Hungary by assessing the factors that influence their use of FinTech services. The novelty of the analysis lies in the selected population, as women are less likely than their male counterparts to have digital skills in a professional capacity. This may be reflected in their openness to financial technology solutions. The analysis is based on a questionnaire due to its sociological dimension, with a prospective sample of university students from Győr. The methodology is based on factor analysis, which is capable of distinguishing the factors that influence the use of FinTech services based on a statistical analysis of variables (Likert scale). The results show that there are several factors influencing women's FinTech usage habits, which service providers should pay attention to. The findings of the current study can help FinTech companies shape their marketing and service strategies to improve their ability to reach and retain potential and existing female customers.

**Keywords** – attitudes, factor analysis, females, financial digitalization, fintech, generation Z

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## 1. INTRODUCTION

In the contemporary era, technological advancement plays a pivotal role in the financial sector. Therefore, it is crucial to assess how society perceives and uses novel technologies. Financial technology (FinTech) services represent a significant aspect of financial innovation. However, studies that examine digital proficiency indicate that women tend to exhibit lower competencies in this field, largely due to their preconceptions and previous experiences (Schorr, 2019). The development of digital skills by male and female users is not homogeneous, necessitating a differentiated approach. Although educational courses can facilitate the enhancement of digital competencies, the "do-it-yourself" method has also gained

popularity. However, there is a paucity of literature that examines the efficacy of this approach (Matzat & Sadowski, 2012). Some research indicates that, despite the discrepancy in proficiency, women are more active users of digital tools due to their ability to improve their lives by expediting the resolution of problem-solving tasks (Hilbert, 2011). Furthermore, Hungary's financial digitization performance is perceived to be relatively deficient compared to other EU countries (Kovács & Vinkóczy, 2022). Consequently, the study of FinTech services represents a compelling research topic within the region. The following research questions have been formulated with the aim of making a contribution to this field of study: What factors influence women in the Z generation to use the services provided by financial technology companies?

The social presence of financial technology and its acceptance by users can facilitate the achievement of sustainability goals, which is of significant value for businesses and citizens in the contemporary era. The application of technological advances, the use of big data (Mamun & Buics, 2024), and the rise of digital financial solutions can contribute to the achievement of this objective. During the contemporary period, the convergence of sustainability and financial technology (FinTech) has emerged as a compelling avenue to leverage innovation within the financial sector to advance environmental and social objectives. This intersection presents fertile ground for exploring the myriad connections between sustainability imperatives and the transformative potential of FinTech innovations.

One of the pivotal linkages between sustainability and FinTech lies in the realm of financing sustainable projects. FinTech platforms have emerged as powerful enablers of capital allocation, facilitating the flow of funds towards environmentally and socially beneficial initiatives. Furthermore, FinTech platforms are spearheading the development of innovative financial products and services tailored to support green financing endeavours. From green bonds to carbon offset trading platforms and energy efficiency financing programs, these solutions mobilize capital for renewable energy projects, energy-efficient buildings, and sustainable infrastructure developments, thus facilitating the transition towards a more sustainable economy. By harnessing big data analytics, FinTech firms can provide valuable insights into companies' sustainability performance, enabling investors to identify ESG risks and opportunities with precision and efficacy.

Currently, the global financial ecosystem has undergone notable influence from two discrete yet interrelated phenomena: technological advancement (FinTech) and sustainable finance (Kumar et al., 2022). There is also a gap between understanding the relations between FinTech and stability and their influence, so researchers have managed so far to prove mainly the positive influence between FinTech and sustainability. Several studies have explored FinTech and sustainability in various aspects, such as the impact of blockchain in banks (Ji & Tia, 2022), green banking adoption (Tara et al., 2019), FinTech adoption for sustainable performance (Yan et al., 2022), and also green banking discloser (Bose et al., 2018). In the literature, from the perspective of FinTech and sustainability, it is frequently asserted that knowledge remains fragmented and insufficiently explored. From the banking perspective literature has presented that the adoption of FinTech increases banks' environmental performance (Guang-Wen & Siddik, 2023), service continuance (Ashrafi et al., 2022), endorsing financial inclusion to accomplish carbon neutrality (Brahmi et al., 2023). The recent increase in the number of such studies confirms the growing interest in the topic. Nevertheless, while both concepts (digitalization and sustainability) have been researched, their intersection

remains underdetermined (Taneja et al., 2023) and largely underexplored.

Overall, the integration of sustainability and FinTech heralds a transformative shift towards a more sustainable and inclusive global economy. The objective of this study is to make a meaningful contribution to the existing body of knowledge in the field by exploring the factors that influence female users' adoption of fintech services. This investigation is particularly relevant in the context of sustainability efforts, which are often hindered by a lack of understanding of the user base. Using the synergies between technology and finance, stakeholders are poised to drive positive environmental and social impact while fostering financial innovation and inclusion on a global scale.

### ***1.1 The Attitudes and Behaviours of Women towards Innovation, Digital Technology, and Finance***

The results of the previous study revealed a gender difference in the use of financial technology. Women face distinct obstacles and hurdles to achieve financial inclusion relative to men (Arora, 2020). These challenges stem from various factors such as lower income levels, limited financial literacy, and a lack of trust in banking institutions (Saluja et al., 2023), among factors such as attitudes being the most influential in determining behavioural intention, and the value of status quo being crucial in explaining use behaviour (Igamo et al., 2024).). Other factor such as traditional gender roles can also influence technology usage (Hoque et al., 2024). Although this gender asymmetry is prominent and widespread in Asian markets like Indonesia (Igamo et al., 2024), Bangladesh, Pakistan (Barra et al., 2024), and India (Hoque et al., 2024), there are no such discrepancies between genders regarding financial technology usage in the European region (Ferilli et al., 2024).

The results of the study reveal that social influence plays a central role in predicting the inclination of female respondents to adopt technology, highlighting their greater susceptibility to social pressures compared to men. In contrast, for male respondents, digital skills emerge as the primary predictor, indicating their prioritization of technical competencies. This suggests a distinct gender pattern in technology adoption within the Pakistani context, with men emphasizing hard skills while women place greater importance on social factors. This divergence may be attributed to men's focus on structural aspects and familiarity with scientific fields, juxtaposed with the societal pressures and psychological influences that shape women's technology usage, especially in entrepreneurial endeavours (Barra et al., 2024). In the study of Fadil et al. (2016) organizational innovation acceptance was measured, their results indicate that gender serves as the moderator influencing varying perceptions of organizational innovation among male and female employees. Although male employees may perceive high levels of organizational innovation as resulting in high internal service quality within the organization, female employees may express the opposite viewpoint (Fadil et al., 2016). Considering the

results from the literature this gender asymmetry regarding innovation acceptance and technology usage might be a result of cultural aspects.

## 2. METHODOLOGY

The objective of this study is to conduct an exploratory factor analysis in order to identify the factors that may influence the usage patterns of FinTech services by Generation Z women in Hungary. Knowledge of the thinking of the opposite gender may be relevant for service providers. In order to achieve this, purposive sampling was carried out among the female students of economics at the Széchenyi István University of Győr, as they have a reliable financial knowledge and openness to the topic under study. The research was based on a questionnaire survey conducted by convenience sampling in an online format using Google Forms. The survey period spanned from May 6 to July 31, 2023. A total of 130 questionnaires were received from female university students who are currently utilizing FinTech services.

The questionnaire consisted of closed, five-point Likert-scale (strongly disagree - strongly agree) and nominal questions. This type of Likert-scale measurement has been identified as the optimal method for obtaining information from respondents (Chen et al., 2015). The online survey interface allowed for the avoidance of missing data, while ensuring the exclusion of bias due to response laxity. This was achieved by mixing questions (items) in the questionnaire period and pre-screening data (responses) as part of the analysis process. The survey focused on Generation Z women, born between 1995 and 2009 (McCrindle, 2018), and the database was cleaned based on this information and the standard deviation of the responses to the items, as this value appeared to be unanimous at a value below 0.25). After data cleaning, 119 valid responses were included in the analysis, resulting in a validity rate of 91.54%.

The factors and variables that were deemed valid for inclusion in the analysis are grounded in prior research, as evidenced by Alkhwalidi et al. (2022), among others. The present analysis encompassed a total of 10 factors, including psychological factors (motivation, attitude), as well as factors pertaining to the utilization of FinTech services. The following factors were included in the initial phase of the analysis: Performance expectancy (5 items), Effort expectancy (4 items), Social influence (5 items), Facilitating conditions (4 items), Behavioral intention (4 items), Personal innovativeness (4 items), Uncertainty avoidance (3 items), e-Loyalty (4 items), Attitude (3 items), and Motivation (6 items) (Chong et al., 2010; Roets & Van Hiel, 2011; Alkhwalidi et al., 2022; Tian et al., 2023). The application of exploratory factor analysis is predicated on the understanding of the factors, thereby enabling the construction of a model that aligns with the objectives of the present analysis, while simultaneously excluding factors and items that are deemed unsuitable for inclusion in the model. Thus, the aim of this study is to construct a factor

model that provides information on the use of Fintech services with a satisfactory model fit.

In exploratory factor analysis, several preliminary conditions for the analysis, model fit indicator and reliability must be met. The compliance criteria (threshold values) are as follows. Correlation between variables  $>0.3$  (Habing, 2003) which can be measured with Spearman's rho due to ordinal scales (Ritter, 2012), Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO):  $>0.5$ , Bartlett's Test sig.:  $<0.05$ , Communalities:  $>0.25$ , Goodness of Fit Test:  $>0.00$ , Total Variance Explained:  $>33\%$ , Factor Weights:  $>0.25$  (Barna & Székelyi, 2008), Cronbach Alpha  $>0.7$  (Cronbach, 1951). In a factor analysis based on a questionnaire survey, it is not necessary for the variables included to have a normal distribution (Muthén & Kaplan, 1985). In the context of psychometric analysis, it is recommended to use the skewness and kurtosis values to test the violation of the normal distribution. The accepted cut-off point for questionnaire-based exploration of personal characteristics and attitudes is between +2 and -2 for kurtosis and skewness (George & Mallery, 2010).

It is important to emphasize that the exploratory factor analysis was performed using the maximum likelihood method and varimax rotation, which are the most commonly used methods in questionnaire analysis, as these settings (mainly varimax rotation) are able to ensure the best distribution of explained variances across factors (Kaiser, 1958). On consideration of the constraints imposed by the available space, this paper presents only the best-fitting model. Statistical analyses were performed using the IBM SPSS Statistics 25 software package.

## 3. RESULTS AND DISCUSSIONS

The set of variables included in the best-fitting model was as follows (the literature basis for inclusion in the analysis is also indicated):

- Behavioural intention (BI)
  - BI\_2: I will always try to use FinTech services in my daily life. (Tian et al., 2023)
  - BI\_3: The probability that I will recommend FinTech applications and services to a friend is very high. (Nathan et al. 2022)
  - BI\_4: I intend to use FinTech applications and services when I purchase items. (Tian et al., 2023)
- Attitude (A)
  - A\_1: I believe using E-Payments or other FinTech services by mobile services is a good idea. (Chong et al., 2010)
  - A\_2: Using E-Payments or other FinTech services by mobile is a pleasant experience. (Chong et al., 2010)
  - A\_3: In my opinion, it would be desirable to use the FinTech applications and services. (Chong et al., 2010)
- Performance expectancy (PE)

- PE\_1: I find the FinTech services useful in my daily life. (Venkatesh et al., 2003)
- PE\_2: Using FinTech services enables me to perform my financial transaction quicker. (Venkatesh et al., 2003)
- PE\_5: FinTech services would bring me greater convenience. (Venkatesh et al., 2003)

The Spearman correlation values of the variables used to derive the optimal model were between 0.759 and 0.353, thus meeting the preliminary conditions. In terms of the discrepancy from the nominal distribution, the kurtosis values for the nine items included ranged from 0.811 to -0.722, while the skewness values ranged from -0.191 to -0.739. Accordingly, the discrepancy from the normal distribution is not more pronounced than the limit of the literature. Furthermore, the Bartlett test significance level was adequate, the KMO value was very good (0.876), the total explained variance value was also acceptable at 68.34%, and the Goodness of Fit test was approved with a value of 0.253. The variance was distributed almost equally among the factors. The results indicated that behavioural intention (26.12%), performance expectancy (23.06%), and attitude (19.16%) were the explanatory factors for the use of FinTech services by Generation Z women. In order to assess the reliability of the factors and variables, Cronbach's alpha values are utilized as an indicator. The final model demonstrated reliability values between 0.825 and 0.866, which corresponded to the established threshold of 0.7. In general, the fit of the exploratory factor analysis model was acceptable and the factor weights and factor loadings were in accordance with the factors analysis conditions (Table 1).

**Table 1** Factor weights and factor loadings

Code	Communalities (Factor weights)	Factor loadings		
		BI	A	PE
BI_2	0,710	0,758	-	-
BI_3	0,782	0,802	-	-
BI_4	0,614	0,708	-	-
A_1	0,645	-	0,612	-
A_2	0,690	-	0,770	-
A_3	0,615	-	0,585	-
PE_1	0,601	-	-	0,605
PE_2	0,953	-	-	0,923
PE_5	0,539	-	-	0,658

Source: Authors' own research, 2024

The results of the study indicate that three factors influence the use of fintech services among Generation Z women in Hungary: behavioural intention, attitude, and performance expectancy. The factor weights indicate that the speed of transactions provided by the service is the most relevant factor in service use in relation to the performance expectancy factor. The least important variable, which is also part of this factor, is the convenience function. This can be explained by the digitalization of traditional banks, which has enabled them to provide convenience functions to an increasing extent. However, they may still be

outperformed by the options offered by FinTech services in terms of quality and pricing. It has been observed that young bank customers have been gradually moving away from traditional, physical, branch banking. This is reinforced by the fact that, in the context of the sustainability of banking business models, it has been identified that traditional banks cannot afford to remain static as customer convenience demands are increasing and the need for online banking and 24/7 access is growing among young people. These options are no longer seen as an option, but rather as the default, coupled with zero cost and effortless application (Sadiku et al., 2022).

The factor loadings indicate the relative importance of the variables by factor. The results indicate that, for the intention of behaviour, friendly recommendation is the most important variable for young women. This indicates that the persuasive influence of friends as a source of psychological and empowering support is a substantial variable in the adoption and dissemination of positive practices related to FinTech services among young females. The second most important variable of this factor (usability in everyday life) is consistent with the previous literature assumptions. The process of getting used to the benefits of technology can easily convince those interested in digitalization to use the service in the long term. In the context of FinTech-related applications of digital technology, it appears that young female openness to adopting technological innovations may be enhanced by recognizing the benefits. In relation to the attitude factor, it is essential to emphasize that other studies analysing females have also identified attitude as one of the most critical factors in the adoption of FinTech financial services by females. This is due to the fact that it increases the positive perception of FinTech services. Furthermore, attitude has the potential to shape behavioural intentions into usage intentions, which can serve as a persuasive factor for hesitant usage behaviour (Igemo et al., 2024).

The most dominant attitude among Hungarian women with respect to mobile usability is that of a pleasant (positive) experience. However, this type of use may not be universally applicable (e.g., pampering), as it can be described as the most practical, since it requires a device that is used by every young person on a daily basis. The findings also indicate that the desirability of using FinTech applications is part of the attitude factor motivating female university students to utilize the service. This may be partly due to the influence of the social environment (family, friends, experts, celebrities), which may be of interest in terms of subjective norms regarding the desirability of mobile payments. This link between attitude and behavioural intention is mostly achieved by sharing opinions/views in person or through other means of communication (e.g., social media). The aforementioned research is related to members of Generation X in Hungary. However, the impact on other social networks may be equally relevant to Generation Z women.

The performance expectancy factor exerts a significant impact on the utilization of FinTech services by young



women. This is evident from the factor weights for the speed of transactions. The same robust effect is observed within the factor itself. However, it should be noted that the importance of the sense of everyday utility is the least important effect for women. This phenomenon may be attributed to the fact that FinTech services are not a regular part of the daily routine of female consumers. This is particularly true for risky options such as the stock market and cryptocurrencies, which are rarely used. The data indicate that the reasons for the observed differences in risk taking behaviour between women and men vary in importance between countries. This may act as a disincentive for female investors to adopt certain investment strategies that are characterized by a high degree of risk (Barasinska and Schafer, 2017). This mindset can be beneficial for women in making decisions about financial resilience.

Preliminary investigations (e.g., Chen et al., 2023) into the subject matter indicates that women are less inclined to utilize financial technology (FinTech) services than men. The most recent research (e.g., Kumar & Rani, 2024) indicates that sociodemographic factors (age, education, and income) have a significant impact on awareness among male users, whereas this type of influence is negligible for female users. Furthermore, awareness has a notable effect on perceived usefulness and ease of use for both genders. In the case of women, perceived behavioural control has been shown to negatively influence FinTech adoption, as evidenced by their concerns about personal data privacy, data pollution, and cybercriminals. The present study lends support to the findings of other studies (e.g., Setiawan et al., 2024) that have identified similar factors influencing the adoption of fintech among female users. These include perceived usefulness, perceived ease of use, user innovation, attitude, trust, and brand image.

#### 4. CONCLUSIONS

The expansion of the information and communications technology sector has been significantly facilitated by the widespread use of mobile phones and a notable increase in market growth, accompanied by evolving consumer expectations and financial support and subsidies from regulators and governments (Horner & Cunnane, 2017). Consistent with the aforementioned findings, the results of the exploratory factor analysis indicate that the utilization of FinTech services through mobile applications is of critical importance for Gen Z female users. Moreover, the use of FinTech services by women can be quantified along the dimensions of behavioural intention, attitude, and performance expectancy. Furthermore, technological advances brought about by digitalization are facilitating the widespread use of smartphones in everyday life (Szabó-Szentgróti et al., 2024).

Consequently, the skills needed to use technology are becoming essential in society. In light of the findings, a variety of recommendations can be offered to FinTech providers and the government:

- Distinguishing between male and female FinTech users;
- Reward in case the existing user recommends the service (friendly recommendation);
- Smooth, barrier-free transactions;
- Practical and desirable use.

It is acknowledged that some of these suggestions can be achieved by refining the information technology requirements of the application that provides the platform for accessing the service. It is also recognised that females are less open to digital solutions (Mouraz & Nobre, 2024); therefore, it is recommended that a friendly, easy-to-understand, manageable and reliable interface be provided. It is further acknowledged that certain recommendations should be based on prior experience, as only these recommendations can be truly convincing to potential users. The utilisation of reward incentives for fintech services has already become a prevalent practice, and the outcomes demonstrate that they can exert a substantial influence on female users. Therefore, refining these options and customising them for users may prove to be an effective solution.

The present study mainly focused on the perceptions of women in the field of FinTech. However, it is also essential to underscore the role of government decision-makers in this context. It is not clear whether reducing or regulating the number of these providers would be an effective solution. However, it is evident that the government must facilitate the integration of fintech solutions into the banking system if it wishes to maintain customer loyalty and aims to have the households' money in Hungarian banks.

Regarding the present Hungarian analysis, it should be noted that the sample consisted of female university students. However, it is a cross-sectional analysis and is not representative; hence, the results should be interpreted with caution. However, these findings were in line with the previously presented literature on several points. A number of studies (e.g., Ameziane & Touat, 2022) have highlighted the necessity for governments to create a conducive environment for the FinTech industry through the implementation of regulatory and support policies. This is essential for the growth and development of FinTech services. The findings of this paper can assist FinTech companies in developing strategies to engage with Generation Z females and governments in formulating policies to support these services. This is particularly relevant in the context of gender differences in the adoption of digital technology, as evidenced by the existing literature. It would be beneficial to identify this as a future research direction in order to conduct a comparative analysis on a representative sample.

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