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Customer Loyalty in E-Banking Across Generations

Abstract: This article aims to identify the differences in customer loyalty among generational groups in the context of electronic banking. The study is based on a survey that was conducted among 321 Polish respondents. Using correspondence analysis and chi-square tests, we confirmed statistically significant generational differences in loyalty; Generation Z showed the lowest loyalty levels, while Baby Boomers displayed the highest.

By applying correspondence analysis – a rarely used method in this context – we revealed distinct loyalty patterns that were linked to generational traits. The findings suggest that banks should adopt age-differentiated loyalty strategies. For younger customers (particularly Millennials

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and Generation Z), personalised digital experiences, alignments with brand values, and emotional engagement may be key to improving their loyalty. In contrast, emphasising service reliability, long-term trust, and security is likely to be more effective for older generations such as Generation X and Baby Boomers. This study enhances both a theoretical understanding and practical strategies for customer retention in e-banking.

Keywords: electronic banking, generations, intergenerational differences, consumer behaviour, loyalty, chi-square test, correspondence analysis

JEL: G21, J10, O33

1. Introduction

In recent years, the rapid advancement of digital technologies has significantly transformed the financial services landscape, with online banking becoming a central channel for customer interactions. As consumers increasingly embrace digital platforms, understanding the factors that influence customer loyalty in this context has become crucial for those banks aiming to sustain competitive advantages and long-term profitability. Among these factors, generational differences play a pivotal role; these have shaped customers' expectations, behaviours, and loyalty patterns.

Prior research has indicated that generational cohorts differ markedly in their attitudes towards technology adoption, preferences for service delivery, and financial behaviours. Older generations such as Baby Boomers and Generation X are often characterised by more stable and enduring loyalty, being grounded in long-term relationships and trust-based interactions with their banks (Chawla, Joshi, 2017; Rosário, Casaca, 2025). In contrast, younger cohorts – Millennials (Generation Y) and Generation Z – tend to value convenience, flexibility, and personalised digital experiences, which can lead to more-transactional relationships and lower loyalty levels (Manyanga, Makanyeza, Muranda, 2022; Rodrigues, Oliveira, Rodrigues, 2023). These generational distinctions suggest that loyalty-building strategies should be tailored to meet diverse customer expectations across all age groups.

Moreover, the literature shows that generational segmentation enhances the effectiveness of marketing strategies by allowing banks to target the specific needs, preferences, and values that are inherent in each cohort (Bolton et al., 2013; Lissitsa, Kol, 2016). Understanding these nuances supports the development of differentiated engagement models, thus improving both customer satisfaction and retention.

Although the concepts of generational segmentation and customer loyalty have been widely studied, there is a lack of empirical research that combines both perspectives within the context of electronic banking; this is evidenced by the fact that, as of July 2025, there were only two publications that were devoted to the topic in the Scopus database. Most existing studies focus on general consumer behaviour or specific industries such as retail or tourism, while research on e-banking loyalty across generational cohorts remains scarce. Moreover, little is known about these patterns in the context of Central and Eastern Europe, where digital-banking adoption is growing rapidly. This study aims to address this gap by analysing generational differences and to examine whether there are significant disparities in customer loyalty in the context of electronic banking. The hypothesis that there are significant generational differences in the loyalty levels of e-banking customers was tested using empirical data from Polish consumers.

Using a data set categorising customer loyalty levels across four generational groups, we applied correspondence analysis and chi-square testing to explore patterns of association and differences among cohorts. The correspondence analysis revealed clear generational distinctions in loyalty profiles, with Generation X exhibiting the highest loyalty levels and Generation Y the lowest. Complementing this, the chi-square test comparing Baby Boomers and Generation X found no significant difference in loyalty distribution, thus indicating similar loyalty structures among older customers.

These findings contribute to the growing body of literature on digital banking behaviour by highlighting how generational identity influences loyalty and by providing actionable insights for banks seeking to optimise customer engagement in a digital era. The results underscored the need for differentiated approaches that address the unique preferences and expectations of both younger and older customers, ultimately enhancing loyalty and fostering sustainable relationships in an increasingly competitive marketplace.

Specifically, banks should implement loyalty-building strategies tailored to the values and digital behaviours of each generation:

1. For Generation X and Baby Boomers, banks should emphasise trust-based communication and relationship management, and they should provide reassurance through human interaction and reliability.
2. For Millennials and Generation Z, focus should be placed on enhancing digital user experience, offering personalised product recommendations, leveraging social media engagement, and ensuring mobile-first service design.

These targeted strategies enable banking institutions to segment their digital communications and service offerings more effectively, thus leading to higher customer-retention rates and improved profitability.

2. Literature Review and Theoretical Background

2.1. E-banking

Electronic banking refers to the ability to connect to a bank's website in order to use any virtual banking function (Vyas, 2012). E-banking is a term that also describes the possibility of carrying out bank transactions without the need to visit a bank branch (Khan, 2017). Thanks to the rapid development of innovative technologies, the financial sector has undergone a transformation, including the growth of its distribution of services via electronic systems (Litvishko et al., 2020). As a result, the expectations of e-banking customers are rising. With technological progress, users expect to be able to conduct bank transactions anytime and anywhere without the need to visit a branch and without limitations related to a bank's working hours (Hammoud, Bizri, El Baba, 2020).

In Poland, the number of electronic banking users is constantly rising. According to NetB@ank reports published by the Polish Bank Association (Związek Banków Polskich, 2014; 2024), the number of individual clients with access to internet banking services exceeded 25 million by the end of the fourth quarter of 2014. In the fourth quarter of 2024, the number of individual accounts with access to e-banking reached over 44.5 million, which means an increase of nearly 80% over the 2014 numbers. Additionally, the number of active users of mobile banking applications increased to 23.8 million. This indicates the growing demand for fast and convenient financial solutions.

The increasing importance of electronic banking presents a challenge for the banking sector. Banks must continuously adapt their offers to the changing expectations of their customers, who differ in terms of age, lifestyle, and technological experience. This requires the need to develop solutions that are tailored to the needs of each group. Meeting all expectations – such as speed, high-quality services, and ease of use – affects not only customer satisfaction but can also translate into customer loyalty to a bank (Khadem, Mousavi, 2013; Snarska, 2015; Toor et al., 2016).

Given that the diversity of customer expectations is influenced by age and technological familiarity, banks must adopt a segmented approach in their digital service designs and communications. This includes offering intuitive interfaces and support options for less-tech-savvy older customers while delivering innovative, fast, and personalised experiences for the younger generations who are digitally native.

2.2. Generations

A generation is a term used to describe a group of people who were born at about the same period of time. The concept of generations was developed by sociologist Karl Mannheim in 1928. He presented his theory in an essay entitled 'Das Problem der Generationen' (translated into English as 'The Problem of Generations') in 1952. According to Mannheim, a generation consists of individuals who were born at the same time and share common historical experiences which influence the forming of their values and attitudes (Mannheim, 1952). In his publication, the sociologist also emphasised that the worldviews of young people generally differed from the beliefs of previous generations (Mannheim, 1952) and that these differences may have primarily come from the diverse historical and cultural experiences that shaped each generation.

In Poland, the term 'generation' was used by sociologist Maria Ossowska in the 1960s. She presented various meanings of this term – as a result of biological succession, as a hierarchy in a genealogical chain, and in an ahistorical sense: 'young people' versus 'old people.' Ossowska also defined a generation as a group of people who are associated with specific historical events (Ossowska, 1963). In the socio-cultural context, Barbara Fatyga defined a generation as a group of individuals who grew up in a specific socio-cultural environment (Fatyga, 2005).

Based on the above and similar definitions, a classification into successive generations has developed in sociology and social psychology – Baby Boomers, Generation X, Generation Y (Millennials), and Generation Z. The members of each of these generational cohorts share certain characteristics and attitudes that have resulted from their common socio-cultural experiences; meanwhile, they also differ from individuals who belong to other generations.

The years that mark the time boundaries of each generation are conventional and may differ slightly depending on the adopted criteria. In our study, the following dates were used:

1) Baby Boomers – born during the period of 1945–1964;
2) Generation X – born during the period of 1965–1981;
3) Generation Y (Millennials) – born between 1982 and 1994;
4) Generation Z – born after 1995.[1]

This generational division allows us to identify differences in behaviours and values among those individuals who were born during different historical periods. Each generation was shaped by different economic, political, social, and cultural events which influenced the values they held as well as their life attitudes and expectations (Hansen, Leuty, 2011).

Baby Boomers

The term 'Baby Boomers' refers to the post-war demographic boom generation. Representatives of this group grew up during a period of economic growth, enjoying freedom (Gwarek, Samitowska, Smoguła, 2014). Individuals belonging to the Baby Boomer generation are described as hard-working and loyal to their superiors, valuing promotions and recognition in the workplace (Kupperschmidt, 2000; Apostolidis, Polifroni, 2006). They tend to be individualists, focused on individual needs (Beutell, Wittig-Berman, 2008), but they also possess strong social skills (Bejtkovský, 2016) and appreciate the importance of teamwork (Aniszewska, 2015). However, they adapt slowly to technological progress and often lack technical skills (Bejtkovský, 2016).

Generation X

Generation X followed Baby Boomers and is represented by individuals who grew up in the presence of computers (Bejtkovský, 2016) – they were the first to come in contact with computers and the beginnings of the Internet. This generation is recognised for its independence and self-reliance. The representatives of Generation X are referred to as 'latchkey kids' (Beutell, Wittig-Berman, 2008), because they spent a lot of time unsupervised, during their parents' work, which taught them resourcefulness. People belonging to this generation value a work-life balance. Baby Boomers' motto of 'live to work' was transformed to 'work to live' for Generation X (Berkup, 2014). Many individuals from Generation X are well-educated, enterprising, and responsible, with a strong career focus. Thanks to their knowledge, they can take on managerial positions (Aniszewska, 2015).

1 This study only included adult participants; hence, the limitation of the Generation Z age group to 2005.

Generation Y

Generation Y, also known as Millennials (Howe, Strauss, 2003), is the digital generation that grew up with the development of computers, the Internet, and mobile phones. Representatives of this group quickly adapted to new technological solutions and efficiently used digital media and technologies in their daily lives (Aniszewska, 2015). They are a generation that is open to change and highly adaptable (Berkup, 2014). They are often flexible and ready to reskill. They also value personal development, are goal-oriented, and are motivated to achieve success (Williams, Page, 2011). Compared to previous generations, Millennials show lower levels of commitment and loyalty to their employers (Gwarek, Samitowska, Smoguła, 2014). They are not afraid to change jobs – especially if their current one does not meet expectations.

Generation Z

Individuals belonging to Generation Z have been surrounded by the newest technology since birth. This generation uses mobile phones/smartphones and the Internet on a daily basis, and social media interactions are integral parts of their lives (Yadav, Rai, 2020). They use multiple sources of information at the same time, constantly receiving news from all over the world (Williams et al., 2010). The constant presence of various stimuli and the need for quick responses have contributed to them being called 'multitaskers' (Bejtkovský, 2016); however, this may have decreased their problem-solving abilities (Aniszewska, 2015). Excessive multitasking can reduce concentration and cause difficulties when focusing on one task and using several devices during learning may negatively affect the educational process (Carrier et al., 2015). Generation Z is flexible and continuously looks for development opportunities. Stability in the workplace is not a priority for them, as they easily change jobs (Dolot, 2018).

Table 1 presents selected differences between the generational cohorts.

Table 1. Differences among generations

Criterion	Baby Boomers	Generation X	Generation Y	Generation Z
Technology	Grew up without technology	Learnt technology in adulthood	Grew up with technology	Born into the digital world
Communication style	Formal; face-to-face, phone	Direct, concise; phone, e-mail	Informal, quick; text messages, messengers	Abbreviated, uses emojis; social media
Core values	Family, work, loyalty	Independence, balance	Freedom, personal development	Freedom, flexibility, personal identity
Attitude towards work	'Live to work'	'Work to live'	'First live, then work'	'Work-life balance;' work as the possibility of development and self-fulfilment

Criterion	Baby Boomers	Generation X	Generation Y	Generation Z
Job mobility	Low; long-term employment with one company	Moderate	High – easily change jobs	Very high – prefer remote, flexible work
Attitude towards finances	Long-term planning; cash payments	Medium-term goals; some use of credit – debt at life stages	Short-term desires; credit dependency	Struggles with budgeting and financial planning
Purchase decision making	Brand loyalty; influenced by authority figures	Brand changing	Low loyalty, influenced by friends	Trend-driven; impulsive shopping

Source: own elaboration based on Berkup, 2014; Aniszewska, 2015

2.3. Age Groups as Market Segments – How Does Age Affect Customer Decisions About Purchasing and E-banking Usage?

The present consumer market is highly dynamic and complex (Dańska-Borsiak, Grzelak, Roszko-Wójtowicz, 2024). Many factors influence consumer preferences, choices, and behaviours; this is why marketers segment customers based on factors such as age, gender, or place of residence (Schewe, Noble, 2000). As many studies have indicated, each age group is characterised by different values and is guided by diverse factors that influence their purchasing decisions. In their study, Hervé and Mullet (2009) found that, for the youngest part of the surveyed group, a low price was a sufficient reason for making a purchase, while for older participants, usefulness was more important. For the oldest part of this group, durability was the priority. In a study on online shopping behaviour, the findings obtained by Fekete Farkas et al. (2021) showed that the purchasing behaviour of young consumers significantly differed from the behaviour of the over-50 age group, and young people were more likely to buy products online than older buyers were. Similarly, Tomić, Leković, and Tadić (2019) indicated that there was a statistically significant difference between tourists' ages and their activity preferences at tourist destinations.

The differences among the age groups are visible not only in their purchasing decisions and consumer preferences but also in their approaches to financial services (including electronic banking). The results of surveys and focus groups presented by Camilleri and Grech (2017) suggested significant differences among the generations in preferred banking service channels and systems. According to the authors, the study's results may be particularly useful for financial institutions, which, due to growing competition, should consider generational diversity when preparing offers. Kumbhar (2011) also highlighted differences among the age groups in the context of service quality and customer satisfaction in e-banking. He recommen ded adapting services to customers' expectations – particularly young people who are familiar with modern services – without ignoring the needs of older groups. Similar conclusions were presented by Kavitha (2017) in her study. According to the author, banks should customise their strategies to reach customers from different age groups.

Considering the differences in the approaches to digital banking, Rodrigues, Oliveira, and Rodrigues (2023) found that, for Generation X, the most important factor was service availability. Generation Y mainly used digital banking to explore the financial market and perform banking operations from any location, while the most significant for Generation Z was the ability to make simple transfers. The analysis conducted by Shams et al. (2020), describing the experiences and expectations of the different generations in using mobile banking, showed that Generation X finds it complicated and would prefer simpler functions. Millennials primarily use mobile banking for quick payments, while Generation Z expects the development of personalised services and improved user interfaces. Meanwhile, Heaney (2017), who compared internet banking usage between Generations X and Y, found that, although more members of Generation X used this form of banking, users from Generation Y not only did so more often but also used a wider range of virtual products and services (and had grater experience in using them).

Financial institutions should incorporate these generational preferences into their marketing and service-delivery models. For example, simplifying functionalities and emphasising service availability may attract Generation X, while enhancing personalisation and user-interface design will better engage Millennials and Generation Z.

2.4. Consumer Loyalty

Customer loyalty is a concept that has been widely defined in the literature. According to Oliver (1999), loyalty refers to the customer's attachment to a particular product, service, or brand as well as repeated purchases – even despite the competing products and marketing efforts aimed at changing consumer behaviour (Oliver, 1999). A similar definition was proposed by Zeithaml, Berry, and Parasuraman (1996), who described loyalty as showing preferences for a particular company over others, continuously choosing its products or services, and continuing (as well as striving) to build stronger relationships in the future. Loyal customers are not only inclined to choose the same product or service due to their previous experiences but also because of their future expectations (Arslan, 2020). In electronic banking, customer loyalty refers to the regular use of digital banking channels such as mobile applications, online banking platforms, or electronic payment systems and the willingness to recommend these services to other users.

Customer loyalty is influenced by a variety of determinants, which has been confirmed by numerous empirical studies. One of the key factors is satisfaction (Shankar, Smith, Rangaswamy, 2003; Demirci Orel, Kara, 2014; Arslan, 2020; Sharma et al., 2020). The more satisfied the customers are, the more loyal they tend to be towards a brand (Sharma et al., 2020; Roszko-Wójtowicz et al., 2025). This association is also observable in the context of electronic banking (Baabdullah et al., 2019). As Arslan (2020) emphasised, however, building customer loyalty also requires the establishment of an emotional bond, since the perceived value of a product or service may have a stronger influence on future customer behaviour than post-purchase satisfaction. Trust also plays a crucial role as a predictor of customer loyalty (Hsu, 2008; Gul, 2014; Roszko-Wójtowicz et al., 2025) and can significantly enhance it in the banking sector (Kishada, Wahab, 2013).

Another important determinant is service quality, which has also been confirmed by numerous studies – particularly in the context of electronic banking (Kaura, Prasad, Sharma, 2015; Amin, 2016; Özkan et al., 2020). High service quality – including factors such as reliability, security, and personalised customer care – can increase both satisfaction and trust (Roszko-Wójtowicz et al., 2024). Satisfied customers are more likely to use a service again or purchase additional products and recommend them to others; this in turn strengthens their loyalty.

Additionally, the literature has confirmed that technology acceptance (conceptualised as the extent to which individuals are willing to adopt and use new technologies) has a positive impact on customer loyalty (Tasrif et al., 2023). Consequently, key elements of this process such as perceived usefulness and ease of use play significant roles in fostering customer loyalty (Mai, Takahashi, Tuan, 2013; Widyanto, Ariyani, 2023).

Nevertheless, it is important to note that loyalty to a brand, product, or service may not always result from positive customer experiences. This may be the result of technological, economic, or psychological barriers that prevent changes or make it difficult and expensive (Selnes, 1993). In such cases, even highly dissatisfied customers may remain loyal.

In the context of electronic banking, improving service quality and building trust must be aligned with the specific digital behaviours and expectations of each generation. For older customers, reliable and secure services that reinforce trust are paramount, whereas younger generations value ease of use, continuous innovation, and emotional engagement through personalised digital experiences.

2.5. Consumer Loyalty Across Generations

The level of customer loyalty is shaped not only by determinants such as satisfaction with offered services or trust in a brand but also by moderating demographic variables (including age) (Patterson, 2007; Klopotan, Buntak, Drozdjek, 2014; Oğuz, 2017; Gajanova, Nadanyiova, Moravcikova, 2019; Manyanga, Makanyeza, Muranda, 2022; Rosário, Casaca, 2025). Belonging to a specific age group affects purchasing decisions and consumer preferences and plays a role in the customer's level of loyalty.

According to the analysis by Rosário and Casaca (2025), Generation X demonstrates higher brand loyalty compared to Generations Y and Z. This is partly due to the lower susceptibility of this group to digital marketing. The purchasing decisions of Generations Y and Z are often influenced by the content that is available on social media, which contributes to their lower loyalty levels. Research has shown that, as the generation of 'digital natives,' Generation Z represents the greatest challenge for companies implementing loyalty programs. They have continuous access to information and are highly aware of marketing tactics (Gutfreund, 2016), are reluctant to try new brands (Ruixia, Chein, 2019), and prefer high-quality products at low prices (Ayuni, 2019). As Rosário and Casaca (2025) recommended, companies must better understand their values and characteristics to effectively build brand loyalty among the younger generations.

Moreover, Fajarwati and Haliza (2024) presented significant generational differences in the impact of social media marketing and consumer engagement on brand loyalty. Their analysis showed that informativeness and trends positively influenced brand engagement among Generations Y and Z. In the case of interactivity, Generation Z was characterised by a better response to dynamic and interactive social media content. Furthermore, Ruixia and Chein (2019) analysed the factors influencing brand loyalty in the footwear industry; they found that Malaysian consumers from different age groups (Baby Boomers, Generation X, and Millennials) had different purchasing patterns and behaviours, which impacted their loyalty levels.

The observed differences in the level of brand loyalty across generations suggest that such dissimilarities may also exist in the banking sector and in electronic banking. Although the number of studies on the generational differences in e-banking customer loyalty are limited, some analyses have addressed this topic. The study by Manyanga, Makanyeza, and Muranda (2022) confirmed that age significantly moderated the impact of customer satisfaction on loyalty. Similar results were found by Chawla and Joshi (2017), who determined that age influenced decision-making processes in banking. Considering the level of attachment to a bank, Millennials showed lower loyalty levels when compared to Generation X and were characterised by a greater propensity to risk. As a consequence, this could be used in the sale of financial services with a higher degree of risk (Kaczmarek, 2019).

Understanding generational differences is crucial for effectively designing loyalty programs. Younger generations such as Millennials (Generation Y) and Generation Z expect greater digital responsiveness, personalisation, and instant access to services. As Bolton et al. (2013) noted, building loyalty among younger consumers requires digital engagement strategies, including personalisation and active brand presence on social media.

Moreover, Lissitsa and Kol (2016) found that, despite their higher digital engagement, Generation Y members are less loyal to specific brands compared to Generation X; this makes their long-term retention in loyalty programs more challenging unless these programs are properly tailored to Gen Y's expectations. Wood (2004) pointed out that younger consumers (aged 18–24) tended to exhibit more-transactional brand behaviours, meaning that their loyalty may depend on immediate benefits or convenience.

Emotional factors should not be overlooked. Van der Westhuizen (2018) emphasised that emotional bonding with a brand and customer experience (brand experience) were key loyalty drivers – particularly in the financial services sector, where they can be strengthened through personalised service and intuitive mobile applications.

Based on the above-presented considerations regarding the differences in the attitudes and levels of customer loyalty among the representatives of the different generations, the following hypothesis was proposed:

H1: Belonging to a generational cohort significantly affects the level of loyalty of e-banking customers.

For banks, these generational loyalty patterns imply the necessity for tailored loyalty programs:

1. Programs targeting older generations should focus on long-term relationship building, reliability, and personalised attention.
2. For Millennials and Generation Z, loyalty programs must be dynamic and digitally interactive, and they should incorporate social media, gamification, and personalised incentives.

Additionally, banks should leverage data analytics in order to continuously adapt loyalty strategies based on changing behaviours within generational cohorts, thus ensuring their responsiveness to evolving preferences.

3. Research Methodology

3.1. Sample and Data Collection

The research sample included 321 respondents from Poland, and the subject of the analysis was an assessment of customer loyalty. The variable was described by using several indicators that the survey participants assessed using the five-point Likert scale. The scale ranged from 'strongly disagree' (1) to 'strongly agree' (5).

3.2. Sample Characteristics

An overview of the basic information about the respondents (including their generational cohort, gender, education, place of residence, and employment status) is presented in Table 2.

Table 2. Sample characteristics

Characteristics	Category	Frequency	Percentage
Generation	Baby Boomers	102	31.78
	Generation X	98	30.53
	Generation Y	82	25.55
	Generation Z	39	12.15
Gender	Male	145	45.17
	Female	176	54.83
Education	Primary	36	11.21
	Vocational	74	23.05
	Secondary school	122	38.01
	Bachelor's degree	16	4.98
	Master's degree or higher	73	22.74

Characteristics	Category	Frequency	Percentage
Place of residence	Village/town with up 20,000 inhabitants	165	51.40
	City with 20,000–100,000 inhabitants	37	11.53
	City with more than 100,000 inhabitants	119	37.07
Employment status	Permanent employment	197	61.37
	Temporary employment	15	4.67
	Disability benefit recipient/pensioner	78	24.30
	Student/pupil	7	2.18
	Unemployed	12	3.74
	On parental/childcare leave	4	1.25
	Not working for other reasons	8	2.49

Source: own elaboration

As shown in Table 2, the majority of the respondents in the study were women (accounting for nearly 55%). Regarding the generational distribution of the respondents, the largest group consisted of the Baby Boomer generation (102 individuals, which was nearly 1/3 of the study participants). The numbers of representatives belonging to Generation X and Generation Y were 98 and 82, respectively. The smallest group was formed by participants from the youngest generation – Generation Z, with only 39 individuals (accounting for 12.15% of the total sample).

3.3. Level of Loyalty

The level of loyalty was determined based on three indicators and assessed by using a five-point Likert scale. Figure 1 presents the distribution of the e-banking customer loyalty levels.

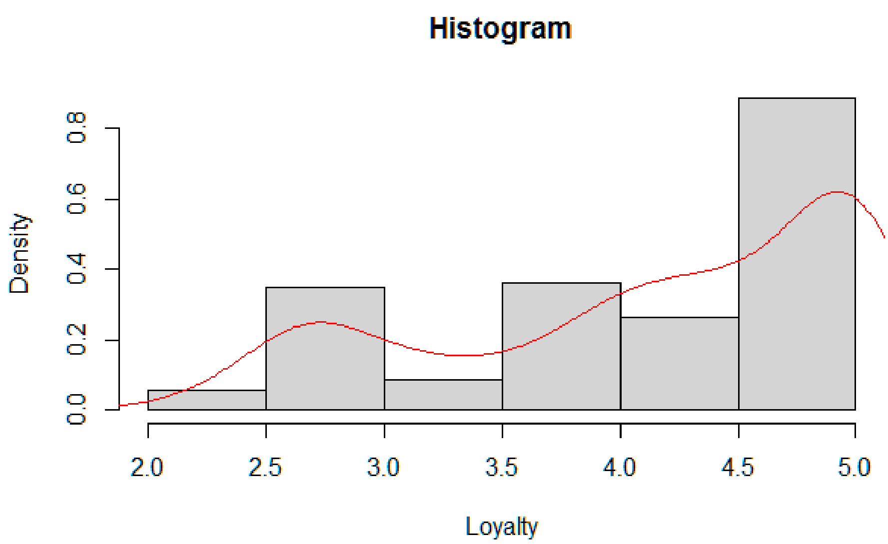

Figure 1. Distribution of customer loyalty levels
Source: own elaboration

As the result of these values, the levels of loyalty were classified into three classes: low, moderate, or high. The lowest observed value was 2 (no value equalled 1); therefore, the following categories were adopted:

1) low loyalty (values of 2 to 3.5);
2) medium loyalty (values of 3.5 to 4.5);
3) high loyalty (values of 4.5 to 5).

The categorisation was performed with reference to the values of the 33rd and 66th percentiles while also considering the distribution of the variables and the frequency of each observed level of loyalty. The division into the above categories was formed for the purpose of simplifying the interpretation of the results as well as to ensure the clarity of the further analysis.

After dividing the variable describing the level of loyalty into three categories, the numbers of respondents in each class were as follows: 79 – low loyalty; 100 – medium loyalty; and 142 – high loyalty. This meant that more than 44% of the surveyed participants demonstrated strong attachments to the bank(s) whose services they used. On the other hand, low loyalty could be observed in fewer than 25% of the respondents.

3.4. Statistical Methods

This article focuses on an analysis of the relationship between the levels of loyalty of e-banking customers and their belonging to selected generational cohorts. The variables that were used in the study were qualitative (nominal and ordinal variables); therefore, they were selected as suitable tools for analysing this type of data in our research. The variables in the study did not follow a normal distribution; therefore, nonparametric tests were selected. A significance level of 5% was adopted in the conducted tests. The analysis was performed using R software (Version 4.0.3).

The first of the methods that were applied was the chi-square test of independence. This test allowed us to examine whether there was a relationship between two categorical variables and determine whether one variable was independent of the other (Buckalew, Pearson, 1982). The chi-square test of independence can be used for both data on a nominal scale and variables that are measured on higher scales, including ordinal (Argyrous, 1997). This method can only be used for discrete data (Maxwell, 1971); therefore, continuous data should be transformed into a discrete form (e.g., by using intervals).

In the second part of the study, correspondence analysis was used to supplement the results that were obtained from the chi-square test and to identify the structures of the relationships between the levels of loyalty of e-banking customers and their belonging to a particular generational cohort. This method allowed us to determine the relationships between categories and their graphical presentations in a common coordinate system (Kaczmarek, 2023); therefore, this correspondence analysis was well-suited for marketing research that analysed customer preferences and attitudes

(Gajanova, Nadanyiova, Moravcikova, 2019). This statistical tool is an exploratory technique and is not suitable for testing hypotheses (Hair et al., 1998), and the identified relationships cannot be considered to be statistically significant (Beldona, Morrison, O'Leary, 2005).

4. Results

4.1. Generational Differences in Customer Loyalty Level

The results of the analysis were presented in two stages. In the first stage (for the prepared categories), a chi-square test of independence was conducted, which allowed us to determine whether there was a statistical relationship between the level of loyalty of an e-banking customer and his/her belonging to a generational cohort. In the second part, correspondence analysis was used to identify the structures of the relationships between the variables.

Chi-square Test

Figure 2 presents the distribution of the loyalty levels of e-banking customers for each of the surveyed generations.

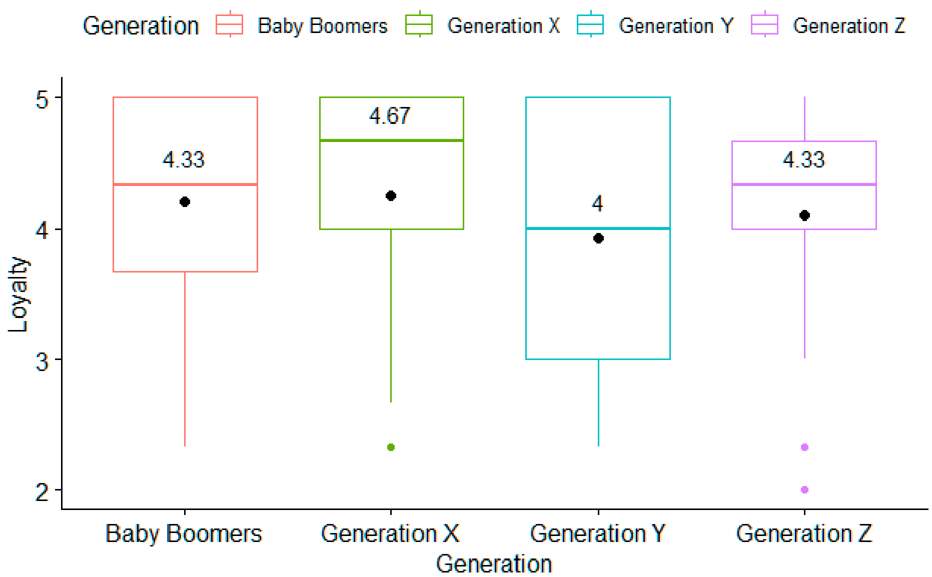

Figure 2. Distribution of customer loyalty levels across generations
Source: own elaboration

The presented boxplots (Figure 2) indicate the existence of some differences in the levels of loyalty among the generations. The highest median (4.67) could be observed for Generation X, which suggested that people who were born during the period of 1965–1981 were characterised by a higher level of loyalty than the other generations and had a more positive attitude towards e-banking services. In turn, the median for Generation Z was equal to 4, which indicated the moderate level of loyalty of the youngest generation. Considering the interquartile range, the greatest diversification of loyalty ratings could be seen for Generation Y; on the other hand, Baby Boomers and Generation X showed more consistency in their responses. A relatively narrow range could also be observed for Generation Z (although this group also demonstrated outliers), which indicated the presence of individuals with low levels of loyalty.

In order to examine the existence of a relationship between the categorised level of loyalty and the belonging to a generational group, the chi-square test of independence was used. The test result (x^2 = 14.169, df = 6, p-value = 0.03) rejected the null hypothesis, which confirmed the statistically significant associations between the considered variables. This result supported Hypothesis H1, thus indicating that the level of loyalty among e-banking users varied significantly across generational groups. To further explore this relationship and visualise the structures of associations between the categories, a correspondence analysis was carried out.

Correspondence Analysis

The following contingency table presents the distribution of the loyalty levels depending on the generational groups of the respondents (Table 3). The percentages of each loyalty level group (low, moderate, high) are provided in parentheses next to the actual values for each generation.

Table 3. Loyalty levels by generations: Baby Boomers and Generations X, Y, and Z

Generation/ Loyalty Level	Low loyalty	Moderate loyalty	High Loyalty
Baby Boomers	23 (23%)	31 (30%)	48 (47%)
Generation X	19 (19%)	26 (27%)	53 (54%)
Generation Y	29 (35%)	25 (30%)	28 (34%)
Generation Z	8 (21%)	18 (46%)	13 (33%)

Source: own elaboration

Based on the analysis of the values that are presented in the cross-tabulation (Table 3), it can be stated that, for the oldest generational groups (Baby Boomers and Generation X), the representatives were classified as predominately 'high loyalty;' however, only Generation X constituted more than half of the respondents from this generational cohort (54%). In the cases of Generation Y and Z, the highly loyal customers represented approximately 1/3 of each of their groups.

Moderate loyalty was demonstrated by 26 individuals from Generation X (27%) as well as 31 and 25 respondents from the Baby Boomers and Generation Y, respectively; each constituted approximately 30% of the generational units. The percentage of the representatives of the youngest generation who were characterised by moderate loyalty was 46%, which constituted nearly half of this group.

Considering low loyalty levels, the largest number of individuals in this category were Millennials (29 surveyed participants), which represented 35% of this generation's respondents. In turn, the smallest percentage of the least-loyal e-banking customers was noticeable for Generation X (19%); this corresponded to 19 individuals – fewer than 1/5 of the representatives of this generational cohort. The results that were presented in the cross-tabulation (Table 3) suggested that larger numbers of the most-loyal customers could be observed for the older generations. This relationship is illustrated in Figure 3 (obtained by correspondence analysis).

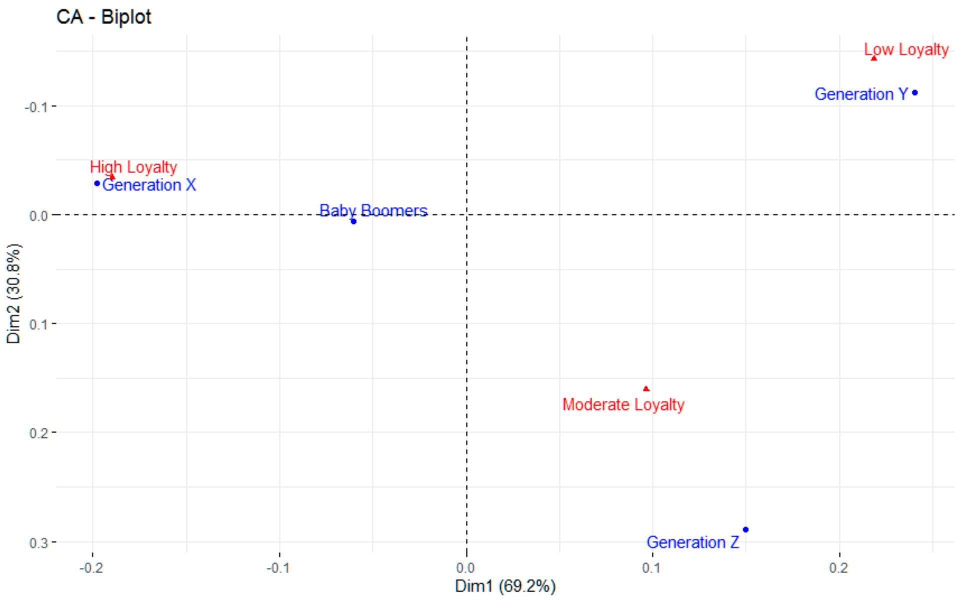

Figure 3. Biplot of correspondence analysis: relationships among generations and customer loyalty levels
Source: own elaboration

In Figure 3, points that represent the generations and loyalty categories were plotted in a two-dimensional space defined by Dimension 1 (69.2%) and Dimension 2 (30.8%); together, this explained 100% of the total inertia (variance) in the data. The spatial relationships in the plot indicate the directions and strengths of associations among the categories. Points that are closer together reflect stronger associations, while those further apart indicate weaker or negative relationships. The horizontal axis (Dimension 1) primarily differentiates between the levels of customer loyalty, with categories such as 'high loyalty' and 'low loyalty' positioned on opposite ends of the axis. The generations are distributed along this axis based on their associations with these loyalty levels. The Generation X point is located near the 'high loyalty' category on the right-hand side of Dimension 1 and near the horizontal axis, thus indicating a strong positive association between Generation X and high customer loyalty. In contrast, Generation Y is on the opposite side of the plot – near the 'low loyalty' category, which suggests a very strong negative association with loyalty and a tendency among Generation Y respondents towards lower loyalty levels. Generation Z is situated in the lower-right quadrant – closer to the 'moderate loyalty' category, which supports the interpretation of a more balanced or intermediate level of loyalty in this group. However, the distance between the Generation Z and 'moderate loyalty' points is much larger than the distance between these categories in the previous two cases. Finally, the Baby Boomer point is located near the centre of the plot, with no strong directional association to any single loyalty level; however, the smallest distance is to 'high loyalty,' which may imply a weak but positive connection between these two categories. Based on the above-presented interpretation of the strengths of the associations, it can be also said that those points that lie along the same vector direction from the origin tend to additionally share similar profiles. For example, the alignment of Generation X and 'high loyalty' along the same direction from the origin strengthens the interpretation of a positive relationship.

The correspondence analysis thus offers a clear graphical representation of the associations among the generational groups and their levels of customer loyalty. The explained inertia of 100% in two dimensions ensured that no substantial variation was lost, thus making the biplot a reliable tool for interpreting these relationships. The results supported the hypothesis that generational differences significantly influenced loyalty to online banking services. Figure 3 supports those conclusions that were similar to those that were drawn from the analysis of the contingency table, which indicates that individuals belonging to Generation X were more likely to be highly loyal customers as compared to the other generational groups. Generation Z demonstrated moderate loyalty, whereas Generation Y appeared to be the least loyal. The position of Baby Boomers on the correspondence analysis plot was relatively close to the origin, but the smallest distance could be observed in relation to the 'high loyalty' category. This suggested that the oldest survey participants may also show loyalty towards the online banking services that they use (although the association is less-pronounced).

To further validate the patterns that could be observed in the correspondence analysis, an additional Pearson's chi-square test was conducted to compare the distribution of customer loyalty between Generation X and Baby Boomers. These two generational groups appeared to be relatively close to one another in the correspondence analysis biplot, thus suggesting a potentially similar loyalty profile. The chi-square test yielded a statistic of $x^2 = 0.99$ (df = 2), with a p-value of 0.61, which indicated that there was no statistically significant difference in the distribution of the loyalty levels between Generation X and Baby Boomers. These results provided additional support for the interpretation that was derived from the correspondence analysis – namely, that the structure of customer loyalty was comparable across these two generations.

5. Discussion

Consistent with prior research (e.g. Patterson, 2007; Klopotan, Buntak, Drozdjek, 2014; Bekk et al., 2016), the results of the above-presented chi-square tests and the corresponding analysis suggested that age may be considered as a factor that influences the level of customer loyalty, as significant differences could be observed among the generational groups. This evidence aligned well with the existing literature that has indicated that age-related factors – such as technological adoption rates, attitudes towards digital financial services, and preferences for interaction modes – influence loyalty levels (Chawla, Joshi, 2017; Rosário, Casaca, 2025). The older generations (including Baby Boomers and Generation X) tend to demonstrate more stable and enduring loyalty patterns. This stability may stem from their preferences for trust-based long-term relationships with financial institutions and lower inclinations to switch providers. Additionally, Chaney, Touzani, and Ben Slimane (2017) emphasise that the members of Generation X are currently in their prime earning years and are less influenced by digital advertising, which translates into higher levels of loyalty than the younger generations have. The results of the additional chi-square test proved that the two older generations exhibited similar loyalty patterns. This finding complemented the correspondence analysis, which positioned Generation X and Baby Boomers in close proximity within the loyalty dimension. This reinforced the interpretation that the loyalty structures among these groups were comparable.

Conversely, the younger generations (particularly Millennials [Generation Y] and Generation Z, who are digital natives accustomed to high convenience, flexibility, and personalised digital services) generally exhibited lower loyalty levels. Their purchasing decisions are often based on content shared on social media (Rosário, Casaca, 2025), where other users can both encourage and discourage purchases, thereby influencing their buying behaviours and potentially disrupting their existing brand loyalties. The correspondence analysis further supported this by showing Generation Y being closely associated with lower loyalty and Generation Z having moderate loyalty levels. This pattern reflected their greater willingness to switch providers if service expectations were unmet or better offers appeared.

These findings were consistent with the prior research that had suggested that digital natives prioritise convenience and innovation (often leading to more fluid and transactional relationships with service providers), whereas older customers value reliability and service continuity (Manyanga, Makanyeza, Muranda, 2022; Rodrigues, Oliveira, Rodrigues, 2023). For banking institutions, these insights underscore the importance of adopting segmented generation-specific approaches towards loyalty-building strategies; this includes developing dynamic, mobile-first, and gamified experiences for younger customers (e.g., Millennials and Gen Z) and emphasising personalised relationship-driven support and financial advisory services for older segments (Generation X and Baby Boomers). Incorporating social proof mechanisms such as influencer partnerships, peer reviews, and community engagement may also be critical in building emotional attachments among younger users.

Considering the preferences of the individual generations can contribute to increased customer engagement and loyalty, improved financial results of brands, and stimulated economic development by increasing competitiveness and supporting innovation.

Overall, the integration of correspondence analysis and chi-square testing enriched the understanding of how generational identity shapes loyalty in the digital banking context, thus highlighting nuanced intergenerational differences and similarities that can inform more effective customer relationship management.

6. Conclusions

This study provides valuable insights into the influence of generational differences on customer loyalty towards online banking services. The combined use of correspondence analysis and chi-square testing revealed distinct loyalty patterns across the generations, with Generation X demonstrating the highest levels of loyalty and Generation Y the lowest. Notably, the similarity in the loyalty structures between Baby Boomers and Generation X suggests stable loyalty behaviours among older customers.

These findings confirmed the significant role of generational identity in shaping loyalty in the digital banking context, thus supporting previous research that has emphasised younger generations' preferences for convenience and flexibility (which may result in lower loyalty levels). Conversely, older generations appear to value trust and long-term relationships, thus contributing to stronger loyalty patterns.

For financial institutions, these results highlight the importance of adopting differentiated loyalty strategies that are tailored to the unique expectations of each generation. Considering the different attitudes of each generation, banks should focus on enhancing their personalised digital experiences. In particular, younger generations (Millennials and Generation Z) may require more attention, as they show lower levels of loyalty. They are especially susceptible to the influences of social media and other users' opinions on purchasing decisions; thus, building emotional bonds with brands, preparing personalised digital solutions, and emphasising the values with which they identify may be crucial. In turn, older generations such as Baby Boomers and Generation X are characterised by greater attachments to brands and higher levels of loyalty. For these groups, greater emphases should be placed on the reliability and stability of one's banking services as well as their security. By doing so, banks can better engage diverse customer segments, foster loyalty, and sustain competitive advantages in a rapidly evolving digital marketplace.

Despite the fact that our study provided some insights, it had some limitations that should be considered when interpreting the results. First, the sample size of the study was 321 respondents from Poland, which may have limited the generalisability of the results to a broader population or other cultural contexts. Therefore, we encourage future studies with larger sample sizes in different national environments. We also suggest conducting longitudinal studies that would allow for a more dynamic assessment of loyalty patterns across the generations. By observing long-term trends and customer behaviours, such analyses would provide more accurate and reliable results.

Furthermore, the methods that were used were basic and relatively simple statistical techniques. They only allowed us to identify the existence of relationships between variables but did not provide information on the strengths and directions of the analysed relationships. For future research, we propose the use of more-advanced statistical and econometric approaches to analyses of generational differences in e-banking loyalty. This may enable a more precise examination of the relationships between variables, the considerations of mediators and moderators, and the identifications of the complex patterns of customer behaviours. Nonetheless, this study has laid a foundation for understanding how generational dynamics impact online banking loyalty and offers practical implications for customer relationship management.

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Lojalność klientów bankowości elektronicznej w ujęciu pokoleniowym

Streszczenie: Celem artykułu jest zidentyfikowanie różnic w poziomie lojalności klientów pomiędzy grupami pokoleniowymi w kontekście bankowości elektronicznej. Badanie opiera się na ankiecie przeprowadzonej wśród

321 respondentów pochodzących z Polski. Z wykorzystaniem analizy korespondencji oraz testu chi-kwadrat potwierdzone zostały statystycznie istotne różnice w poziomie lojalności między pokoleniami. Pokolenie Z wykazało najniższy poziom lojalności, podczas gdy najwyższy odnotowano wśród Baby Boomers.

Stosując analizę korespondencji – rzadko używaną metodę w tym kontekście – autorzy ukazują wyraźne wzorce lojalności powiązane z cechami pokoleniowymi. Wyniki sugerują, że banki powinny przyjąć zróżnicowane strategie, dostosowane do różnych grup wiekowych. Dla młodszych klientów, zwłaszcza milenialsów i pokolenia Z, spersonalizowane doświadczenia cyfrowe, identyfikacja z wartościami marki i zaangażowanie emocjonalne mogą być kluczem do zwiększenia poziomu ich lojalności. Natomiast dla starszych pokoleń, takich jak pokolenie X oraz Baby Boomers, nacisk na niezawodność usług, długoterminowe zaufanie i bezpieczeństwo prawdopodobnie będzie skuteczniejszy. Niniejsze badanie poszerza zarówno wiedzę teoretyczną, jak i praktyczne strategie utrzymania klientów w bankowości elektronicznej.

Słowa kluczowe: bankowość elektroniczna, pokolenia, różnice międzypokoleniowe, zachowania konsumenckie, lojalność, test chi-kwadrat, analiza korespondencji

JEL: G21, J10, O33