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# The Development of E-Banking Services Quality Measurement Instrument: MPQe-BS

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**Abstract:** Perceived service quality is a well-researched concept in the marketing literature. Several measurement scales have been proposed, including for banking services, but most apply to the physical service environment. On the other hand, there is a lack of instruments available to measure the quality of banking services in a digital environment. Nowadays, especially pushed by the COVID-19 situation and sustainable development goals promoted by the United Nations, digitalization of services is a new normal. It is often perceived as a green banking practice and a prerequisite to contribute to the SDGs and environment per se. The purpose of this paper is to develop and validate a perceived quality scale of e-banking services. The proposed measurement model was tested on a convenience sample of 335 respondents from Slovenia and Croatia via web-based questionnaires. Content validity, construct validity, dimensionality, and discriminant validity were assessed with EFA and CFA. The results prove that the instrument is appropriate for measuring the perceived quality of e-banking services. It measures six dimensions: efficiency, availability, contact, design, security, and fulfillment. Additional group analysis shows that the scale applies to different cultural contexts. The main limitation of the research is that the instrument measures only the perceived quality of e-banking services provided through online channels. The main theoretical and managerial implications are also discussed.

**Keywords:** perceived quality; customer satisfaction; e-banking



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## 1. Introduction

Service quality and ways of measuring it have been at the forefront of marketing research for the better part of the last 40 years. This makes perfect sense, with the service industry contributing nearly 70% of the national GDP, employing nearly 80% of the entire workforce in the majority of developed countries [1], and accounting for well over 60% of the total gross value added in most EU countries [2].

Several factors contribute to such a situation: globalization, increasing competition, and technological development.

Furthermore, recent occurrences regarding social changes, consumer expectations, and the COVID-19 situation have caused pressure on the supply side to reinvent distribution channels and offer services through all available digital channels. This shift is also aligned with several initiatives that foster sustainable business practices, where going digital is viewed as one of the pathways to adopting environmentally conscious practices. Digitalization is often considered an essential building piece in achieving sustainable transformation [3] and was regularly linked to several of the 17 sustainable development goals put forward by the United Nations [4]. We have observed this shift in several service domains [5], including the banking industry. This shift also demands a revision of all questions related to the quality of such services and particularly the issue of measuring the quality of digital services.

Oliveira and colleagues [6] noted that electronic services could become key in gaining long-term advantages in the 21st-century banking industry. Most banks with traditional brick-and-mortar branches have expanded their business online, and consumers seem to respond well. Recent data show that, in 2020, there were nearly 2 billion active Internet banking users worldwide, with projections showing a steady increase, which should reach 2.5 billion already in 2024 [7]. Today's customers require and demand more personalized banking services and expect to access such services at any time and any place. E-banking provides just that: carrying out a variety of banking activities regardless of time and/or place via their preferable electronic device and more [8–13]. Consumers have also recognized other benefits of e-banking: low fees, time savings, speed of service delivery, convenience and lifestyle compatibility, paperless banking, etc. [14,15].

While the availability of e-banking services is clearly beneficial for consumers, there are also several clear upsides of e-banking for the providers, especially when it comes to reducing operating and fixed costs [10,16–18]. For example, one study [19] compared the operating costs of different banking channels within the US and India, showing that, in India, the cost of Internet banking represents 12% of costs related to operating a physical branch and a mere 1% in the USA. Angelakopoulos and Mihiotis [8] quote similar percentages. Additionally, early research [20] showed that, in general, institutions with Internet banking outperformed non-Internet banks in terms of profitability. Lastly, since the banking industry is regarded as a crucial intermediary in achieving sustainable development [21], moving banking services into an online context can also facilitate the banking industry's and overall sustainability goals. This can be completed in multiple ways, e.g., by providing a way to conduct paperless transactions, reducing consumers' carbon footprint by eliminating the need to drive to physical locations, as well as by providing easier access to sustainable investments. More specifically, digitalization of banking services can at least to some extent facilitate four of the seventeen sustainable development goals [22]: goal 1 (end poverty in all its forms everywhere), by ensuring access to financial services to underprivileged people and people living in remote areas; goal 5 (achieve gender equality and empower all women and girls), by providing equal opportunities and access to financial services; goal 8 (promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all), by enabling micro-, small-, and medium-sized enterprises access to financial services, and by expanding the banking network in all areas; and lastly goal 12 (ensure sustainable consumption and production patterns), by reducing the use of paper and plastic, and by reducing carbon emissions produced by traffic. Developing different e-banking services is also viewed as a contributing factor to green banking practices [23], while researching green banking can also extend into the sustainable banking area, as pointed out by Aracil and colleagues [21].

However, poor service quality is one of the major obstacles to the adoption of Internet banking [10] and can also be regarded as counterproductive when it comes to achieving the aforementioned sustainable development goals. It is thus of great importance to ensure that banks offer quality e-services and constantly monitor how consumers perceive them. Generally speaking, consumers' perceptions of the quality of different service attributes will result in either satisfaction or dissatisfaction [24], which could, in turn, affect consumer behavioral intentions and affective disposition towards the providers. Ayo and colleagues [25] conclude that service quality has become crucial for customer attraction and retention, meaning that e-banking services quality has become an important factor and research topic, both from the consumers' as well as from the providers' point of view. However, in order to deliver and monitor superior quality of e-banking services, we first need appropriate means of measuring it.

One of the basic paradigms in marketing is that perceived quality is the predecessor of customer satisfaction [26–31]. In general, the perceived quality of services is a well-researched construct [32–34] and spreads across a wide range of service environments, including banking [35–38]. In hand with digitalization and the increasing offer of e-services, there is also a growing interest in the perceived quality of e-services [39]. However, there

are only a few specific studies that research the perceived quality of e-banking services [40]. One contributing factor to such a state of affairs is the lack of valid and reliable measures.

In line with the impact of banking services, rapid digitalization in this area, and the general lack of appropriate measurement instruments, the main purpose of our research is to develop a measurement instrument for measuring the perceived quality of e-banking services that customers access via websites or mobile phones.

## 2. Literature Review

### *2.1. E-Service Quality*

E-service quality has received growing attention recently [41,42]. It became a natural conceptual successor to traditional service quality. Further, while they may overlap in some areas, e-service quality can also considerably differ from its brick-and-mortar counterpart [43,44]. E-services are based on digital intermediaries and self-service. They may raise privacy concerns, present a greater risk of fraud, and also require appropriate technology and some technical skill. On the other hand, traditional services are predominantly people-delivered, do not depend on digital interfaces, and cover an extensive array of business fields [39]. It is also important to note that the most renowned conceptualization of service quality assumes that consumers have certain expectations and demands that are service-specific. In other words, service quality is inherently based on what consumers expect versus what they receive from the provider [45]. This means that service quality and e-service quality are also distinct since expectations in an online and physical context differ significantly [39]. Consequently, companies, consumers, and researchers had to adapt and gain new perspectives in tackling this concept.

Some earlier attempts at conceptualizing e-service quality resulted in several different definitions. Parasuraman and colleagues [39] focused on the role of the intermediary in service transactions: the organization's website. They define e-service quality as the extent to which a website facilitates efficient and effective shopping, purchasing, and delivery. Wolfinbarger and Gilly [46] took a broader approach as they view e-service quality in terms of a comprehensive consumer experience and as a global, across-transaction construct, which includes fulfilment/reliability, website design, customer service, and security/privacy dimensions. In more general terms, Amin [10] defines it as the consumer's overall evaluation and judgment on the quality of the service delivered through the Internet.

Researchers were also eager to tackle another important task regarding e-service quality: developing measurement instruments. Among them, E-S-QUAL [39], ETailQ [46], and WebQual [47] have probably received the greatest attention. These examples and some others did, however, prove to be quite context-specific. A review by Shankar and Datta [48] shows that instruments used for measuring e-service quality fall into four contextual domains: e-retailing, website-based shopping, e-banking, and other e-services (including e-learning, e-traveling, e-music, e-consultancy, etc.). Each exhibits some common determinants/dimensions of quality and some that are context-specific. Table 1 shows an adapted overview of Shankar and Datta's [48] conclusions. The rankings of e-service quality measures in Table 1 are based on the frequency of appearance in the literature over four contextual domains. "Privacy and security" appears to be the most common, while others show much more variation: e.g., "system availability" is the second most common dimension in e-retailing quality; it is only sixth in e-banking and other e-services quality and only tenth in website quality. Furthermore, "information", a dimension frequently appearing in website quality research, is limited only to this domain. While these results do not necessarily represent the relative importance of each dimension, they offer informative insight into heterogeneity in e-services quality research.

**Table 1.** Determinants of e-service quality measurements. Adapted from Ref. [48].

| Determinants | E-Services Quality | E-Retailing | E-Banking | Websites/Shopping Sites |
|---|---|---|---|---|
| Privacy and Security | 1 | 1 | 1 | 3 |
| Reliability | 2 | 6 | 9 | - |
| Efficiency | 3 | 5 | 2 | 8 |
| Website design | 4 | 3 | 7 | 1 |
| Responsiveness | 5 | - | 3 | 4 |
| System availability | 6 | 2 | 6 | 10 |
| Fulfilment | 7 | 4 | 8 | 9 |
| Ease of use | 8 | - | 5 | 7 |
| Assurance | 9 | - | 4 | 5 |
| Access | - | 7 | - | - |
| Credibility | - | 8 | - | - |
| Information | - | - | - | 2 |
| Content | - | - | - | 6 |

### *2.2. E-Banking Services and Perceived Service Quality*

Banking services have changed a great deal in the last 20 years. These developments are not only the result of technological advancements but also of changes in the competitive environment and constantly changing consumer expectations and demands. E-banking allows clients to interact, gather information, and conduct bank transactions on digital platforms. However, there is some vagueness when defining what e-banking entails. Some authors [16,19] define e-banking as the provision of banking products and services through electronic delivery channels. These may include Internet banking, but also more traditional channels, such as automatic teller machines (ATMs), landline telephone transactions, as well as the more recent option of mobile banking. To address this, some researchers prefer the term Internet banking (sometimes also web- or online banking), limiting the focus to banks offering their consumers the ability to conduct business with the bank over the Internet [20]. Daniel [49] follows by defining online banking as the provision of information or services by a bank to its customers over the Internet. We should note that, in the present research, we adopt the broad definition of e-banking without limiting ourselves to the Internet but rather including all types of electronic banking channels.

It is important to understand that e-banking services have very specific characteristics, distinguishing them from traditional banking services [8,9,13]. As in other types of e-services, e-banking lacks direct personal interaction, requires some technical skill, and presents different risks and concerns that consumers would not encounter in a physical setting. However, due to its nature, e-banking contributes to cutting banks' operating costs, provides an avenue to a more environmentally friendly business practice, allows banks to add value to their services, and enables them to develop better relationships with their consumers. E-banking, as an aspect of green and sustainable banking services, can also contribute to organizational efforts aimed at minimizing negative ecological impacts and enhancing well-being [50]. Some authors also note that e-banking leads towards sustainability in three main areas, namely the environment, societal aspects, and governance. This is completed either by introducing a variety of electronic devices and improving the quality of operation and technical efficiency, increasing the trust among the general public originating from greater accessibility, or by increasing inclusion in both geographical and income terms [51]. The possibility to develop better relationships is primarily a result of information provided by or collected from consumers that can be gathered and analyzed by the providers and used in the customization of the service [52]. Banks should certainly be aware of the quality or potential shortcomings of their e-banking services [53–55] as understanding the level of service quality and customer satisfaction is crucial. However, measures that were developed for studying the quality of banking services in the physical context, e.g., Banking Service Quality scale [35] and several adaptations of SERVQUAL for the banking industry [36,37], do not appear sufficient for studying the electronic ser-

vice environment [25,56,57]. Moreover, some authors have even applied the traditional SERVQUAL dimensions in online environments but focused only on the evaluation of website quality rather than service in its entirety [58].

While there are instances where authors treated service quality as a unidimensional construct [59], it is more commonly measured multidimensionally [56,58,60]. As shown in Table 1, the most frequently reported measures include privacy and security, efficiency, responsiveness, assurance (trust), ease of use, and others [48]. When it comes to e-banking, privacy and security are often at the forefront of consumers' concerns [61]. They expect that their transactions are secure and that their personal and financial data are kept safe and private. Another important dimension is the efficiency of e-banking services [40]. Easy, structured, and timely ordering, processing, and delivery are key as they can represent the main appeal of using e-banking as a substitute for regular brick-and-mortar branches. Empirical research also supports this notion as the efficiency of the bank's website appears to be the most influencing factor in users' evaluation of e-banking service quality [10,58,62]. Additionally, consumers may expect a high level of responsiveness, which refers to providing constructive responses to customer requests and queries on time [63].

A look into existing models of e-banking service quality shows that previous authors tackled the multidimensional nature of this concept via different approaches. Jayawardhena [56] combined focus groups and quantitative data on an adapted version of the SERVQUAL scale [64]. The qualitative stage showed that modifications to SERVQUAL were needed on dimension- and item levels. Quantitative analysis eventually revealed five dimensions of e-banking service quality: (1) access, (2) web interface, (3) trust, (4) attention, and (5) credibility. Based on Jayawardhena's [56] model, e-banking service quality exhibits (1) several points of entry and the ability to conduct various transactions; (2) regular maintenance of a website; (3) confidence and trust; (4) accurate personalized service; and (5) delivery on promised services. The author also points out that service quality in e-banking is largely affected by the bank's web interface capabilities.

While Jayawardhena [56] used SERVQUAL [45] as the starting point of his research, Siu and Mou [61] developed their model by modifying e-SERVQUAL [63,65]. The modified version consisted of four dimensions, namely credibility, efficiency, security, and problem handling, with efficiency exhibiting the highest correlation with overall e-banking service quality. Zavareh and colleagues [57] applied a similar approach and identified six dimensions of e-banking service quality: efficiency/reliability, fulfilment, security/trust, site aesthetics, responsiveness/contact, and ease of use. Zavareh et al. [57] investigated the E-S-QUAL model [39] in an e-banking environment, showing that six out of seven dimensions from the original model apply, with some adaptations at the item level: fulfilment, efficiency, system availability, privacy, contact, and responsiveness. Ayo and colleagues [25] also identified six dimensions, albeit differently: reliability, responsiveness, system availability, competence, service portfolio, and privacy. Finally, recent work by Shankar and Jebarajakirthy [66] detected five dimensions of e-banking service quality, i.e., reliability, privacy/security, website design, customer service/support, and trust. Table 2 provides a more concise list of commonly highlighted dimensions of e-banking service quality.

Previous research thus leads to two important findings. First, e-banking service quality exhibits features that require distinct conceptualization [25,40,56,57,61,66], and, second, e-banking service quality appears to be culturally dependent. Reviewed studies originate from different cultural backgrounds: Australia, Egypt, Hong Kong, Iran, Malaysia, Taiwan, the UK, etc. Hence, the generalizability of their results may be impaired by cultural factors, as previously indicated by Blut and colleagues [5].

**Table 2.** Dimensions of e-banking service quality.

| Dimensions of E-Banking Service Quality | Studies |
|---|---|
| Efficiency/reliability | [25,40,57,58,61,66] |
| Security/privacy | [25,40,57,61,66] |
| Web interface/design/site organization/site aesthetics | [56–58,66] |
| Trust/Assurance | [56,57,66] |
| Responsiveness/contact/information provision | [25,40,58] |
| Ease of use/usability/user friendliness | [57,58] |
| System availability/Access | [25,40,56] |
| Credibility/Competence | [25,56,61] |
| Fulfilment | [40,57] |
| Customer service/support/problem handling | [61,66] |
| Personal needs/preferential treatment/incentives | [58] |
| Attention/Empathy | [56] |
| Service portfolio | [25] |
| Efficiency/reliability | [25,40,57,58,61,66] |
| Security/privacy | [25,40,57,61,66] |
| Web interface/design/site organization/site aesthetics | [56–58,66] |
| Trust/Assurance | [56,57,66] |
| Responsiveness/contact/information provision | [25,40,57] |
| Ease of use/usability/user friendliness | [57,58] |
| System availability/Access | [25,40,56] |
| Credibility/Competence | [25,56,61] |
| Fulfilment | [40,57] |
| Customer service/support/problem handling | [61,66] |
| Personal needs/preferential treatment/incentives | [58] |
| Attention/Empathy | [56] |
| Service portfolio | [25] |

### *2.3. E-Banking Service Quality and Satisfaction*

The concept of service quality established itself as one of the cornerstones of modern marketing. This is mainly owed to service quality's relationships with other important concepts and business outcomes. Service quality is widely regarded as an important antecedent of customer satisfaction [29]; it relates to consumers' attitudes, perceived value, profitability, and costs [58], company reputation [67], image [60], loyalty [41,68], as well as several types of behaviors, such as word-of-mouth, purchase and repurchase intentions, and others.

The relationship between service quality and satisfaction is one of the most researched topics in marketing. Researchers agree that service quality is crucial in determining consumer satisfaction [61]. Some even portray these concepts as two sides of the same coin [41]: service quality embodies the cognitive aspects of consumer experience, and consumer satisfaction represents the affective side.

Consumer satisfaction is an overall post-choice evaluative judgment and a fulfillment response resulting from consumers' expectations confirmation or disconfirmation [69]. Consumers develop expectations regarding each product or service. These expectations are later confirmed or disconfirmed through the consumer's experience with the offering, which results in either satisfaction or dissatisfaction. Quality is an integral part of the consumer's experience and is thus at the forefront of such evaluations. The vast majority of studies find that service quality significantly impacts consumer satisfaction, both in physical [70] as well as in digital contexts [71]. This is also exhibited by studies in the e-banking environment.

Rod et al. [60] showed that increased overall Internet banking service quality leads to an increase in customer satisfaction with the online service, as well as to an increase in satisfaction with the provider. This connection was established further with the works of several other authors [10,58,72]. Research also reveals some inconsistencies when it comes to e-service quality dimensions' effects on consumer satisfaction. Siu and Mou [61] report

that service quality dimensions had only weak predictive power in the relationship between these two constructs, the strongest being the effect of the credibility dimension. Ariff [71] highlighted website aesthetics and guide dimension as the most impactful and surprisingly found no significant impact of the privacy dimension, which was the most important factor in George and Kumar's study [73]. Herington and Weaven [58] offer some rationale for these inconsistencies. In their study, respondents rated the efficiency dimension as the most important overall to perceptions of e-banking service quality; however, its effect on consumer satisfaction was relatively small. The authors conclude that efficiency might play a role of a hygiene factor when it comes to e-banking services; something similar could be said about privacy. Another reason for such inconsistencies could be related to differing conceptualizations of e-service quality and e-satisfaction, which call for additional review and modifications of measurement models. Hence, the present study aims to develop a reliable and valid measurement model of e-banking service quality, while the inclusion of e-satisfaction provides a pathway to ensure the nomological validity of our instrument.

## 3. Materials and Methods

In the process of reliable and valid scale development, we followed the procedure suggested by Churchill [74] and Malhotra and colleagues [75]. This procedure follows several steps, including (I) specification of the domain of the construct, (II) item generation, (III) pre-test and clarification of the measures, (IV) data collection, (V) assessment of reliability and validity, and (VI) norm development. Similar approaches have been applied in a wide variety of disciplines and areas, although on some occasions with some minor modifications, e.g., [76–78].

### *3.1. Specification of the Domain of the Scale*

Our literature review provided the basis on which we have built the specification of the domain of our e-banking service quality scale. Due to the complementary nature in which consumers access e-banking services via different contact points (primarily websites and mobile phones), we adopted a broader approach to defining e-banking, following authors like Nitsure [19] and Fonseca [16], who view e-banking as the provision of banking products and services through electronic delivery channels. Consistent with this view, e-banking service quality can be defined as the bank's ability to provide and deliver their products and services via electronic delivery channels efficiently and securely.

The literature review also revealed an extensive array of dimensions related to e-banking service quality (see Table 2). We focused on the following: efficiency, system availability, fulfilment, contact, privacy and security, website design/aesthetics/guide. Table 3 provides the details of each dimension.

**Table 3.** Conceptualization of e-banking service quality dimensions.

| Dimension | Details |
| --- | --- |
| Efficiency | E-banking services are easy to use, efficient and well organized. |
| Privacy and security | E-banking service provides protection of personal and financial data and enables secure transactions. |
| Design/aesthetics/guide | Platform through which e-banking transactions are carried out is up-to-date, well organized, easy to navigate and aesthetic. |
| System availability | Consumers can access and carry out e-banking services when needed with no availability issues. |
| Fulfilment | E-banking services are delivered as promised and fulfil consumer demands and expectations. |
| Contact | Consumers can reach out to the e-banking service provider when they encounter issues with the platform. |

Efficiency is one of the most important facets of e-banking service quality. It refers to the ease of use, reliability of the site, and general organization of information and offerings of the provider. It can also be viewed as the determining factor in the initial decision to use e-banking services due to e-banking's ability to reduce hassles and provide a less effortful alternative to visiting brick-and-mortar locations. Similarly, the privacy and security attributes of e-banking services cannot be understated. They are defined as the attributes that provide protection of personal and financial data of the consumer as well as enable secure banking transactions in an online environment. The role of these factors has

been discussed extensively in past research, and, while always important in banking, the rise of digital technologies brought safety and privacy concerns even more to the forefront. Design/aesthetics/guide can also greatly contribute to consumers' experience regarding e-banking. They mostly revolve around the platform through which e-banking transactions can be carried out, its organization, ease of navigation, aesthetics, and potential to stay up to date. The web interface and its design represent the proverbial tip of the iceberg and crucial contact point for the provider and the site's users. Consequently, the perceived quality of these attributes suggests great relevancy to the general e-banking service quality. Furthermore, consumers expect the e-banking site to be ready and available at all times. System availability, therefore, concerns access to e-banking services when needed with no availability issues. Additionally, the fulfillment component should also be included in the e-banking service quality measurement model. Defined as the degree to which e-banking services are delivered as promised and as the degree to which e-banking service fulfills consumer demands and expectations, it contributes to the general appeal of the e-banking service. It may also greatly impact the trustworthiness of the provider and the service in itself. Lastly, we also include contact as an indicator of e-banking service quality. Contact is defined as the degree to which consumers can reach out to the e-banking service provider when they encounter issues with the platform. It may also include different channels (e.g., telephone, e-mail, e-chat). We provide the proposed structure of our conceptual model in Figure 1. Figure 1 also shows the well-established relationship between e-banking service quality and consumer satisfaction as a means to test the nomological validity of our model.

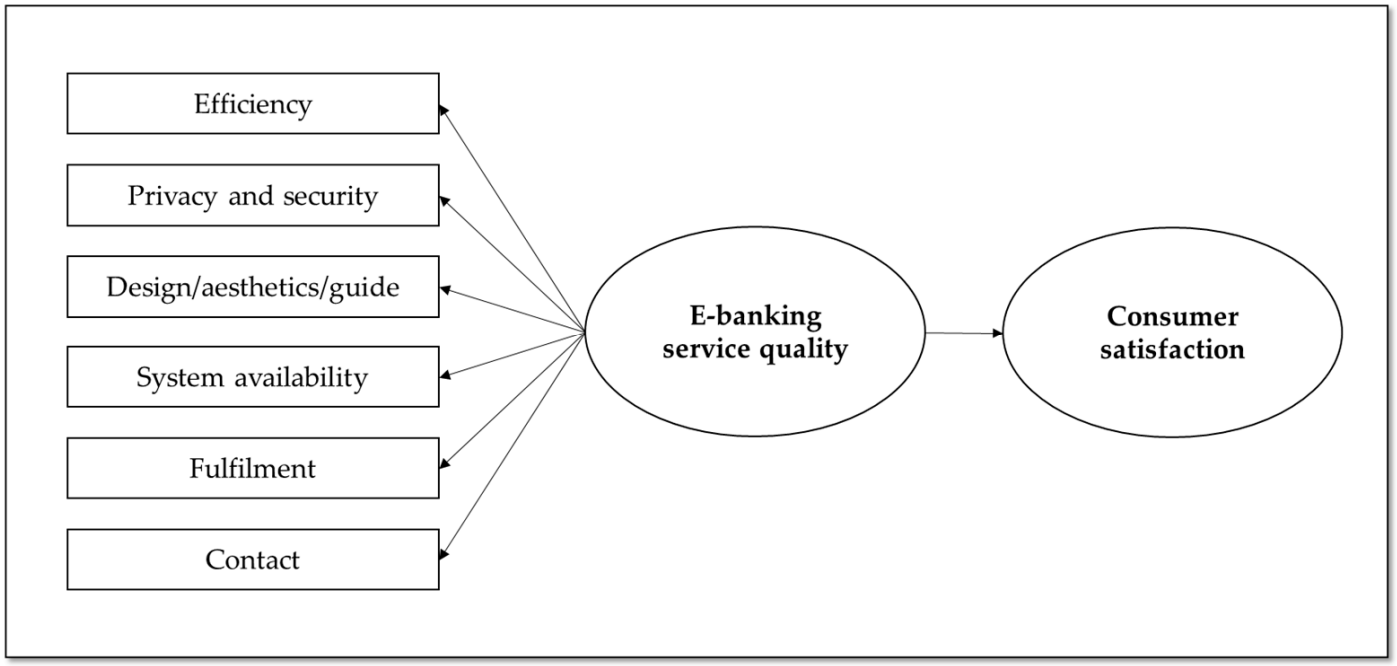


**Figure 1.** The conceptual model of e-banking service quality.

### *3.2. Item Generation—Preliminary Scale*

The preliminary scale consisted of 32 items, including adopted measures from E-S-Qual and E-Rec-Qual [39], measures from models by Shankar and Jebarajkirthy [66], Ariff and colleagues [40], and some self-generated items. All items used for data collection were Likert type, ranging from 1 (completely disagree) to 5 (completely agree). The pool of items included in our preliminary scale is available in Table 4.

**Table 4.** Preliminary item pool of e-banking service quality scale.

| Dimension | Items |
| --- | --- |
| Efficiency | This e-banking site makes it easy to find what I need.<br>It makes it easy to get anywhere on the site.<br>This e-banking site enables me to complete a transaction quickly.<br>Information at this e-banking site is well organized.<br>This e-banking site loads its pages fast.<br>This e-banking site is simple to use.<br>This e-banking site enables me to get on to it quickly.<br>This site is well organized. |
| Privacy and security | My personal information is protected on this e-banking site.<br>My financial information is protected on this e-banking site.<br>The transactions over this e-banking site are secured. |
| Design/aesthetics/guide | The e-banking site is updated regularly.<br>The e-banking site is well organized.<br>The e-banking site includes interactive features.<br>The e-banking site is easy to use.<br>The e-banking site design is aesthetically attractive.<br>The e-banking site design is visually pleasing. |
| System availability | This e-banking site is always available for business.<br>This e-banking site launches and runs right away.<br>This e-banking site does not crash.<br>Pages at this e-banking site do not freeze after I enter the required information.<br>This e-banking site always provides the services at the promised time. * |
| Fulfilment | This e-banking site makes services available within a suitable time frame.<br>When the bank promises to do something by a certain time, it does so.<br>It is truthful about its offerings.<br>The bank makes accurate promises about the services being delivered.<br>It takes care of problems promptly. |
| Contact | This e-banking site provides a telephone number to reach the company.<br>This e-banking site has customer service representatives available online.<br>Quickly resolves online transaction problems.<br>This e-banking site offers the ability to speak to a live person if there is a problem.<br>Customer service personnel are always willing to help me on matters relating to e-banking.* |

* items omitted after expert review.

Four expert judges—one professional from the banking sector, one from the field of service marketing, and two from marketing research—reviewed the items and corresponding concept definitions. Additionally, ten potential respondents (users of e-banking services) checked the scales for clarity and potential redundancy issues. After content validity testing, a final sample of 30 items remained.

### *3.3. Sample Design and Data Collection*

The data for this study were gathered in two neighboring countries: Slovenia and Croatia. In both countries, we used a convenience sampling method, focusing on users of e-banking services. The total sample consists of 335 respondents, of which 207 (62%) come from Croatia and 128 (38%) from Slovenia. There are totals of 230 (69%) female respondents and 105 (31%) males, with an average age of 38.7 (SD = 11.31). Education-wise, the majority of our respondents completed high school (67%), and, income-wise, they earn up to EUR 1000.00 (58%). Table 5 presents a more detailed comparison of both samples, with cumulative numbers on demographic characteristics.

**Table 5.** Sample characteristics.

| | Croatia | Slovenia | Total |
|---|---|---|---|
| Sample size | 207 (62%) | 128 (38%) | 335 |
| Gender | | | |
| Female | 132 (64%) | 98 (77%) | 230 (69%) |
| Male | 75 (36%) | 30 (23%) | 105 (31%) |
| Average age | 36.9 | 41.5 | 38.7 |
| Education | | | |
| Primary school | 6 (3%) | 0 | 6 (2%) |
| High school | 174 (84% | 49 (38%) | 223 (67%) |
| Pre-graduate study | 27 (13%) | 48 (38%) | 75 (22%) |
| Graduate study | 0 | 27 (21%) | 27 (8%) |
| Postgraduate | 0 | 4 (3%) | 4 (1%) |
| Income | | | |
| Up to 250 €/2000 HRK | 13 (6%) | 1 (1%) | 14 (4%) |
| 251–500 €/2001–3500 HRK | 20 (10%) | 7 (6%) | 27 (8%) |
| 501–1000 €/3501–7500 HRK | 117 (57%) | 35 (27%) | 152 (45%) |
| 1001–1500 €/7501–10,000 HRK | 49 (24%) | 43 (34%) | 92 (28%) |
| More than 1500 €/10,000 HRK | 8 (4%) | 42 (33%) | 50 (15%) |

## 4. Results

The first step in survey data analysis included exploratory factor analysis (EFA) on the items, using the principal axis factoring method with varimax rotation through several iterations, which enabled us to eliminate the items with low loadings or high cross-loadings on two or more factors. Due to this process, the final measurement instrument consisted of six dimensions that account for 78.61% of the variance with a total of 25 items represented in Table 6. Table 6 also includes Cronbach $\alpha$ coefficients for each dimension and eigenvalues. The $\alpha$ coefficients exceed the conventional cutoff point of 0.7, showing high internal consistency of each dimension.

Table 6 provides a more thorough overview of the results of EFA: 25 items loaded on six dimensions, with factor loadings showing a fairly unambiguous structure, with all 25 items exhibiting fairly strong relationships to underlying latent factors. In three cases, we noticed some indication of cross-loading on two factors (items "This e-banking site is easy to access," "Information at this e-banking site is well organized," and "This e-banking site is well organized"); however, in all three cases, there was a noticeably stronger relationship to one of the factors compared to the other.

We then further expanded on exploratory factor analysis with confirmatory factor analysis (CFA) [79] to assess the factor structure of our scale. In the first model, all the items were loaded on a single construct, which resulted in an inadequate model fit. The second step was to load the items to six constructs, as indicated by the results of EFA. The six-factor model proved to be significantly better than a single-construct model. Next, we used the analysis of average variance extracted (AVE) to test the convergent validity of this model. AVE estimates the amount of variance explained by a construct in relation to the amount captured by the measurement error. If AVE values exceed the value of 0.50, the construct exhibits acceptable convergent validity. Furthermore, we also calculated composite reliability (CR), which researchers often regard as a more robust measure of internal consistency than Cronbach's $\alpha$ coefficient. CR values larger than 0.70 show adequate reliability. Table 7 provides an overview of model fit indices with standardized regression coefficients (factor loadings in CFA), composite reliabilities [80], values of average variance extracted (AVE) [81], and descriptive statistics.

**Table 6.** EFA results for the e-banking service quality scale.

| Items | Factor Loadings | | | | | | Commu. |
|---|---|---|---|---|---|---|---|
| | **F1** | **F2** | **F3** | **F4** | **F5** | **F6** | |
| This e-banking site is simple to use. | 0.718 | | | | | | 0.829 |
| It is easy to get anywhere on this e-banking site. | 0.703 | | | | | | 0.731 |
| This e-banking site is easy to access. | 0.655 | 0.411 | | | | | 0.771 |
| Information at this e-banking site is well organized. | 0.653 | | 0.400 | | | | 0.732 |
| This e-banking site enables me to complete a transaction quickly. | 0.652 | | | | | | 0.617 |
| This e-banking site simplifies banking transactions. | 0.610 | | | | | | 0.610 |
| This e-banking site is well organized. | 0.599 | 0.422 | | | | | 0.808 |
| This e-banking site launches and works without issues. | | 0.738 | | | | | 0.719 |
| This e-banking site does not crash. | | 0.732 | | | | | 0.680 |
| Pages at this e-banking site do not freeze after I enter the required information. | | 0.693 | | | | | 0.670 |
| This e-banking site is always available for business. | | 0.576 | | | | | 0.615 |
| This e-banking sites' design is aesthetical. | | | 0.690 | | | | 0.686 |
| The e-banking site design is visually pleasing. | | | 0.578 | | | | 0.637 |
| The e-banking site includes interactive features. | | | 0.518 | | | | 0.513 |
| This e-banking site has online customer service available. | | | | 0.836 | | | 0.647 |
| This e-banking site offers the ability to speak to a live person if there is a problem. | | | | 0.689 | | | 0.607 |
| This e-banking site provides a telephone number to reach the company. | | | | 0.599 | | | 0.509 |
| Quickly resolves online transaction problems. | | | | 0.531 | | | 0.628 |
| My financial information is protected on this e-banking site. | | | | | 0.834 | | 0.933 |
| My personal information is protected on this e-banking site. | | | | | 0.812 | | 0.900 |
| The transactions over this e-banking site are secured. | | | | | 0.776 | | 0.869 |
| This e-banking site is truthful about its offerings. | | | | | | 0.813 | 0.806 |
| This e-banking site makes accurate promises about the services being delivered. | | | | | | 0.758 | 0.804 |
| When this e-banking site promises to do something by a certain time, it does so. | | | | | | 0.617 | 0.611 |
| This e-banking site takes care of problems promptly. | | | | | | 0.617 | 0.660 |
| | F1 | F2 | F3 | F4 | F5 | F6 | Total |
| Cronbach α | 0.94 | 0.88 | 0.84 | 0.85 | 0.97 | 0.91 | |
| Eigenvalue | 13.2 | 1.5 | 1.0 | 1.1 | 1.1 | 1.8 | 19.7 |
| Explained variance (%) | 52.6 | 6.0 | 4.0 | 4.6 | 4.4 | 7.0 | 78.6 |

Notes: factor loadings of less than 0.40 have not been reproduced and items have been sorted by factor loadings on each factor. F1—Efficiency, F2—Availability, F3—Design, F4—Contact, F5—Security, F6—fulfilment, Commu.—Communalities.

**Table 7.** Item means, standard deviations, standardized regression coefficients, CR indexes, and AVE values.

| Construct | Item | Mean | SD | β | CR | AVE |
|---|---|---|---|---|---|---|
| Efficiency | This e-banking site is simple to use. | 4.21 | 0.768 | 0.925 | 0.936 | 0.680 |
| | It is easy to get anywhere on this e-banking site. | 4.19 | 0.796 | 0.843 | | |
| | This e-banking site is easy to access. | 4.31 | 0.725 | 0.870 | | |
| | Information at this e-banking site is well organized. | 4.11 | 0.800 | 0.821 | | |
| | This e-banking site enables me to complete a transaction quickly | 4.30 | 0.775 | 0.701 | | |
| | This e-banking site simplifies banking transactions. | 4.39 | 0.742 | 0.680 | | |
| | This e-banking site is well organized. | 4.18 | 0.768 | 0.901 | | |
| Availability | This e-banking site launches and works without issues. | 4.17 | 0.744 | 0.900 | 0.881 | 0.651 |
| | This e-banking site does not crash. | 3.95 | 0.921 | 0.789 | | |
| | Pages at this e-banking site do not freeze after I enter the required information. | 4.06 | 0.912 | 0.748 | | |
| | This e-banking site is always available for business. | 4.22 | 0.732 | 0.784 | | |
| Design | This e-banking sites' design is aesthetical. | 3.84 | 0.886 | 0.873 | 0.847 | 0.651 |
| | The e-banking site design is visually pleasing. | 3.85 | 0.888 | 0.824 | | |
| | The e-banking site includes interactive features. | 3.91 | 0.774 | 0.714 | | |
| Contact | This e-banking site has online customer service available. | 4.10 | 0.867 | 0.817 | 0.853 | 0.594 |
| | This e-banking site offers the ability to speak to a live person if there is a problem. | 3.85 | 0.963 | 0.789 | | |
| | This e-banking site provides a telephone number to reach the company. | 4.30 | 0.776 | 0.680 | | |
| | Quickly resolves online transaction problems. | 3.99 | 0.821 | 0.791 | | |
| Security | My financial information is protected on this e-banking site. | 4.10 | 0.799 | 0.991 | 0.971 | 0.918 |
| | My personal information is protected on this e-banking site. | 4.10 | 0.809 | 0.951 | | |
| | The transactions over this e-banking site are secured. | 4.15 | 0.783 | 0.932 | | |
| Fulfilment | This e-banking site is truthful about its offerings. | 3.87 | 0.945 | 0.922 | 0.916 | 0.734 |
| | This e-banking site makes accurate promises about the services being delivered. | 3.85 | 0.935 | 0.928 | | |
| | When this e-banking site promises to do something by a certain time, it does so. | 3.96 | 0.924 | 0.764 | | |
| | This e-banking site takes care of problems promptly. | 3.87 | 0.825 | 0.801 | | |
| $\chi^2$ = 675.970 (258); *CFI* = 0.945; *SRMR* = 0.051; *RMSEA* = 0.070; *NFI* = 0.915; *IFI* = 0.945 | | | | | | |

Notes: M—mean, SD—standard deviation, β—standardized regression coefficient, CR—composite reliability, AVE—average variance extracted.

The standardized regression coefficients in Table 7 exhibit strong and significant relationships between items and corresponding factors ($p < 0.01$). All the items loaded positively on their predicted latent variables and were higher than 0.60. The composite reliability indexes exceeded the critical value of 0.70, showing acceptable construct reliability for all dimensions, while the values of AVE were larger than 0.50 in all cases, thus confirming the convergent validity of the used constructs.

To test the discriminant validity, we used two commonly proposed methods: the Fornell–Larcker criterion [81] and the heterotrait–monotrait method [82]. The comparison of square roots of AVE values with correlation coefficients between latent variables (Table 8) shows that correlation coefficients for each pair of constructs are lower than the square roots of AVE values. This indicates that we can confirm the discriminant validity of our model.

**Table 8.** Intercorrelation coefficients and values of $\sqrt{\text{AVE}}$.

| | Efficiency | Availability | Design | Contact | Security | Fulfilment |
|---|---|---|---|---|---|---|
| Efficiency | 0.825 | | | | | |
| Availability | 0.787 *** | 0.807 | | | | |
| Design | 0.748 *** | 0.674 *** | 0.807 | | | |
| Contact | 0.627 *** | 0.558 *** | 0.580 *** | 0.771 | | |
| Security | 0.680 *** | 0.582 *** | 0.604 *** | 0.659 *** | 0.958 | |
| Fulfilment | 0.659 *** | 0.628 *** | 0.727 *** | 0.660 *** | 0.575 *** | 0.857 |

Note: *** $p < 0.001$.

The results from the HTMT matrix (Table 9) provide additional support for this finding as all the values are below the critical level of 0.8 [82].

**Table 9.** HTMT analysis matrix.

| | Efficiency | Availability | Design | Contact | Security | Fulfilment |
|---|---|---|---|---|---|---|
| Efficiency | - | | | | | |
| Availability | 0.710 | - | | | | |
| Design | 0.678 | 0.611 | - | | | |
| Contact | 0.566 | 0.488 | 0.502 | - | | |
| Security | 0.657 | 0.558 | 0.576 | 0.601 | - | |
| Fulfilment | 0.660 | 0.601 | 0.661 | 0.597 | 0.543 | - |

After establishing the validity and reliability of our measurement model, we also conducted invariance tests to check for potential differences between Croatian and Slovenian respondents regarding the e-banking service quality scale. Since we are comparing the measurement model across two countries, at least metric invariance should be achieved for researchers to compare the differences in means of the items or latent scores or to compare the differences in latent variable relationships [83]. The results are presented in Table 10.

**Table 10.** Invariance testing.

| Invariance Type | $\chi^2$ | *df* | *IFI* | *TLI* | *CFI* | *RMSEA* |
|---|---|---|---|---|---|---|
| Configural invariance | 1086.458 | 514 | 0.927 | 0.914 | 0.926 | 0.058 |
| Full metric invariance | 1127.239 | 533 | 0.924 | 0.914 | 0.924 | 0.058 |
| *Partial metric invariance* | 1117.909 | 530 | 0.925 | 0.914 | 0.924 | 0.058 |
| Full scalar invariance | 1201.709 | 555 | 0.917 | 0.910 | 0.917 | 0.059 |
| *Partial scalar invariance* | 1153.211 | 548 | 0.923 | 0.915 | 0.922 | 0.058 |

Invariance testing requires establishing configural invariance of the model for both countries. Model fit indices with completely unconstrained model parameters were acceptable. Later, we tested the hypothesis of full metric invariance. Under this hypothesis, $\chi^2$ grew significantly ($\Delta\chi^2(19) = 40.781$), thus showing significant differences in item factor

loadings for Slovenian and Croatian users of e-banking services. A more detailed look revealed that these changes result from varying factor loadings for one of the items under the efficiency construct (This e-banking site enables me to complete a transaction quickly) and two items under the contact construct (This e-banking site has online customer service available; this e-banking site offers the ability to speak to a live person if there is a problem). After freeing the constraints for the aforementioned items, the model fit indices improved and the $\Delta\chi^2$ value was no longer significant, which enables us to confirm the partial metric invariance of our model. Table 11 shows the comparison of all item factor loadings between the two samples.

**Table 11.** Comparison of standardized factor loadings between Slovenian and Croatian e-banking services users.

| Item | Slovenia | Croatia |
|---|---|---|
| EFFICIENCY | | |
| This e-banking site is simple to use. | 0.911 | 0.927 |
| It is easy to get anywhere on this e-banking site. | 0.816 | 0.852 |
| This e-banking site is easy to access. | 0.854 | 0.888 |
| Information at this e-banking site is well organized. | 0.804 | 0.852 |
| This e-banking site enables me to complete a transaction quickly.* | 0.544 | 0.757 |
| This e-banking site simplifies banking transactions. | 0.642 | 0.689 |
| This e-banking site is well organized. | 0.817 | 0.928 |
| AVAILABILITY | | |
| This e-banking site launches and works without issues. | 0.886 | 0.899 |
| This e-banking site does not crash. | 0.742 | 0.838 |
| Pages at this e-banking site do not freeze after I enter the required information. | 0.741 | 0.759 |
| This e-banking site is always available for business. | 0.765 | 0.796 |
| DESIGN | | |
| This e-banking sites' design is aesthetical. | 0.790 | 0.929 |
| The e-banking site design is visually pleasing. | 0.737 | 0.902 |
| The e-banking site includes interactive features. | 0.597 | 0.722 |
| CONTACT | | |
| This e-banking site has online customer service available. * | 0.708 | 0.869 |
| This e-banking site offers the ability to speak to a live person if there is a problem. * | 0.674 | 0.865 |
| This e-banking site provides a telephone number to reach the company. | 0.679 | 0.670 |
| Quickly resolves online transaction problems. | 0.804 | 0.781 |
| SECURITY | | |
| My financial information is protected on this e-banking site. | 0.986 | 0.991 |
| My personal information is protected on this e-banking site. | 0.951 | 0.952 |
| The transactions over this e-banking site are secured. | 0.946 | 0.930 |
| FULFILMENT | | |
| This e-banking site is truthful about its offerings. | 0.886 | 0.933 |
| This e-banking site makes accurate promises about the services being delivered. | 0.884 | 0.945 |
| When this e-banking site promises to do something by a certain time, it does so. | 0.719 | 0.777 |
| This e-banking site takes care of problems promptly. | 0.716 | 0.827 |

* Factor loadings differ significantly.

The last part of our analysis attempted to check the second-order structure of our measurement model and test for nomological validity. Table 12 shows crucial information on factor loadings and intercorrelations between the dimensions of e-banking service quality and consumer satisfaction.

The item factor loadings in our measurement model for the combined sample are highly positive, with only one item with a value below 0.7 (contact). A comparison of factor loadings between the two countries shows no significant differences; however, some values differ noticeably. Even less variation can be observed in the case of consumer satisfaction. Combined sample data show that our model exhibits acceptable reliability ($0.900 \leq CR < 0.917$), acceptable convergent validity ($0.602 \leq AVE < 0.736$), and discriminant validity (tested by HTMT analysis). Goodness-of-fit indexes show acceptable model fit, with the only exceptions being the RMSEA index with a value of 0.083 in the case of combined data, and SRMR index with a value of 0.079 in the group measurement model. Due to the high intercorrelation coefficient between e-banking service quality and consumer satisfaction, we can also assume the nomological validity of our measurement instrument.

**Table 12.** Comparison of factor loadings for second-order factor structure and intercorrelations between e-banking service quality and consumer satisfaction.

| Measurement Model Item | Construct Loadings (Combined) | Construct Loadings (Slovenia) | Construct Loadings (Croatia) |
|---|---|---|---|
| E-BANKING SERVICE QUALITY | | | |
| Efficiency | 0.865 | 0.767 | 0.911 |
| Availability | 0.775 | 0.751 | 0.788 |
| Fulfilment | 0.785 | 0.812 | 0.764 |
| Contact | 0.685 | 0.641 | 0.714 |
| Security | 0.746 | 0.738 | 0.763 |
| Design | 0.785 | 0.781 | 0.785 |
| CONSUMER SATISFACTION | | | |
| Satisfaction with transaction processing. | 0.861 | 0.900 | 0.906 |
| Satisfaction with the decision to use e-banking site. | 0.875 | 0.856 | 0.887 |
| High satisfaction with e-banking site. | 0.904 | 0.865 | 0.862 |
| E-banking site exceeded expectations. | 0.788 | 0.760 | 0.830 |
| Dependent construct | Coefficient (combined) | Coefficient (Slovenia) | Coefficient (Croatia) |
| Consumer satisfaction | | | |
| E-banking service quality | 0.883 | 0.834 | 0.907 |
| $R^2$ | 0.780 | 0.696 | 0.823 |
| Goodness-of-fit statistics | Combined | Group analysis | |
| $\chi^2$ | 112.695 | 196.042 | |
| df | 34 | 77 | |
| CFI | 0.968 | 0.953 | |
| IFI | 0.968 | 0.953 | |
| TLI | 0.958 | 0.954 | |
| NFI | 0.955 | 0.925 | |
| SRMR | 0.033 | 0.079 | |
| RMSEA | 0.083 | 0.068 | |

We have also checked how each dimension of e-banking quality relates to consumer satisfaction. We find that all show significant relationships to our nomological link, although some differences in relationship strength do exist. Our results show that the strongest relationship exists between efficiency and satisfaction ($r = 0.684$; $p < 0.01$), followed by security ($r = 0.449$; $p < 0.01$), while the weakest relationship tends to be the one between contact dimension and satisfaction ($r = 0.173$; $p < 0.01$).

## 5. Discussion

There is a widespread consensus on the need for psychometrically sound instruments for measuring the quality of electronic services. This comes as a result of an ever-so-obvious impact of services in our everyday lives, continuing globalization, increasing competition in the service markets, and technological development. If we also account for worldwide initiatives for social change, sustainable business practices, and all-around digitalization of service delivery channels, it is clear that the existing repertoire of service quality scales requires an update. This also applies to e-banking. The purpose of our research was to develop a valid and reliable measurement instrument for measuring the perceived quality of e-banking services that customers access via a website or mobile phone. After establishing the importance of services, examining the process of digitalization in this area, and its contribution to promoting sustainability goals in the introduction section of our research, we then turned to the literature review, covering e-banking services and the current knowledge base in this field. Based on the literature review, we then developed and tested a new measurement instrument, whereas theoretical and managerial implications are discussed here.

### *5.1. Theoretical Implications*

The present study represents an attempt to contribute to the current state of research on contemporary banking services in the e-environment, particularly web- and mobile banking. The e-banking services have developed intensively in recent years and continue to do so. Consumers have generally recognized the advantages of shifting their banking transactions into the digital environment [14,15]: convenience, personalization, low fees, lifestyle compatibility, paperless banking, etc. This is also evident from the growing number of e-banking services users worldwide [7]. However, rapid development was not followed by the same pace of research, largely because the lack of measurement instruments has failed to follow the fast technological and distribution shifts.

The development of a measuring instrument for perceived quality of e-banking services was a logical choice for closing the knowledge gap between perceived quality of e-services, banking services, and rare and incomplete studies of e-banking services. The developed instrument for Measuring Perceived Quality of E-Banking Services (MPQe-BS) is an original, holistic, robust proposal for measuring the perceived quality of e-banking services in web and mobile contexts. The present study also provides evidence of cross-country stability of the MPQe-BS instrument through the results of invariance testing and confirmation of partial metric invariance. Invariance testing is frequently used to examine the cross-sample and cross-cultural generalizability of measurement instruments [84]. It demands proving equivalent factor structures and equivalent factor loadings, which we were able to complete by confirming configural and metric invariance between the two national samples. Furthermore, our results coincide with the results of previous studies in the field of e-service quality research [40,57,61]. Based on the factor loadings in a second-order measurement model, the most important dimension of e-banking service quality appears to be efficiency of the e-banking site, while the least important dimension in our research is contact. This could also be attributed to our sample characteristics since some authors have previously highlighted the fact that consumer perceptions of some e-service characteristics can be related to other factors, such as education level and usage rate of e-banking services [61].

The final version of MPQe-BS is a six-dimensional twenty-five-item scale with good psychometric properties, which were proven via a variety of reliability and validity tests, including EFA with principal axis factoring and CFA with structural equation modeling for dimensionality and model fit, the analysis of average variance extracted (AVE) for testing the convergent validity, composite reliability (CR) for estimating construct reliability beyond Cronbach $\alpha$ coefficients, and two tests for assessing the discriminant validity of our measurement instrument (Fornell–Larcker criterion and HTMT analysis). However, scale development was limited to only two fairly similar countries and to the fact that the data were gathered on a convenience sample. Further testing of the instrument should be encouraged, especially when it comes to applications in different environments and with the addition of varying controlling variables. It could be beneficial to provide additional tests of scale reliability in terms of test–retest stability and to compare the results acquired with newly developed instruments to the results of other existing measures of e-banking service quality scales. We also suggest that future research investigates the applicability of our instrument with different customer segments, particularly in terms of technology acceptance and/or digital literacy. The main advantages of MPQe-BS are its compact multidimensional structure and ease of use. The relatively small number of items means less workload for the respondent, who, on average, needs 2–3 min to respond on the items. The item pool was created based on an extensive literature and existing scales review. In terms of comparison to previously developed measurement models of e-service and/or e-banking service quality, our scale consists of dimensions most often attributed to these constructs and exhibits favorable psychometric properties. Furthermore, since the data were gathered in two different countries, we applied invariance testing to prove the instruments' usability and stability in different contexts. It should also be noted that,

except for academic purposes, MPQe-BS is also useful for banks that want to determine the perceived quality of their e-banking services.

### *5.2. Managerial Implications*

The development of the new MPQe-BS measuring instrument can have several implications for banks and bank management. Firstly, the scale can help bank managers and researchers in the bank identify cultural differences in customer expectations and preferences for banking service quality. Due to the cross-country equivalency, proven by invariance testing, measuring service quality in different cultural contexts with newly developed measurement instruments can provide insights into how cultural factors impact customer perceptions of service quality and enable banks to adjust their service offerings accordingly. Secondly, this can also improve cross-cultural communication with their customers. By understanding how cultural factors impact customer perceptions of service quality, managers can tailor their communication strategies to better meet the needs of customers from different cultural backgrounds.

One of the main goals of measuring service quality is also identifying in which parts of service delivery improvement is needed. As demonstrated in this research, this can help to improve customer satisfaction by ensuring that the bank is meeting the needs and expectations of its diverse customer base. By using intelligence gathered with a measurement instrument for business decisions, bank managers can gain a competitive advantage over their competitors through understanding the unique needs and preferences of customers from different cultural backgrounds. All in all, the MPQe-BS measurement instrument can ease the transition into the e-banking service scape and assures valid and reliable monitoring of any changes to e-services offerings that banks with already established digital presence might introduce.

Finally, many banking institutions regard the digitalization of their services as key in contributing to sustainable development goals [85]. As mentioned before, the digitalization of banking services can facilitate four of the seventeen sustainable development goals promoted by the UN. This includes ensuring access to financial services to underprivileged people and people living in remote areas, providing equal opportunities and access to financial services, enabling micro-, small-, and medium-sized enterprises access to financial services, expanding the banking network in all areas, and, finally, reducing the use of paper and plastic, alongside the reduction in carbon emissions produced by traffic. However, as some authors have previously pointed out, the many benefits in this area are usually accompanied by significant drawbacks [3,4,86–88]. While poor e-banking service quality may counteract these goals, high-quality e-banking services could also help to alleviate such hindrances, especially when it comes to providing efficient, simple, and accessible service, sound data privacy and security, as well as providing deterrents to financial fraud. A newly developed measurement instrument introduced in this paper can ensure a convenient, psychometrically sound, and stable tool for monitoring the quality of e-banking services and ensuring the appropriate pathway toward achieving sustainable development goals.

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**Institutional Review Board Statement:** The study was conducted as per the guidelines of the Declaration of Helsinki. The research questionnaire was anonymous and voluntary, and data was analyzed only on the aggregate level.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Contact the corresponding author for access to the data presented in this study.

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