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THE IMPACT OF FINANCIAL TECHNOLOGY ON CONSUMER BEHAVIOR AND BANKING SERVICE

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Abstract. This study aims to evaluate the impact of financial technology (fintech) on consumer behavior and banking services through a meta-analysis approach. Along with the rapid development of digital technology, fintech has changed the way consumers access, use, and respond to financial services. This study analyzes and synthesizes the results of a number of relevant empirical studies to identify the patterns, trends, and strength of fintech's influence on consumer behavior and adaptation of banking services. The results of the meta-analysis show that fintech significantly influences consumer preferences and loyalty, especially in terms of ease of access, time efficiency, and convenience of use (r = 0.765 ; t = 8.427) medium effect size category. On the other hand, the banking sector showed a diverse response, ranging from strategic collaboration to internal digital transformation. These findings provide important implications for policymakers, financial industry players, and banking institutions in designing adaptive strategies in the digital era.

Keywords: financial technology; consumer behaviour; banking services; meta-analysis

I. INTRODUCTION

In the past decade, financial technology (fintech) has experienced very rapid growth and has become one of the main drivers of transformation in the financial services sector[1]. Fintech refers to technology-based innovations that are used to improve and automate the delivery and use of financial services. The emergence of fintech is marked by the presence of various digital platforms that offer alternative financial solutions, such as digital payments, peer-to-peer *lending*, application-based investment, to insurance and digital *banking* [2];[3]. This growth is driven by advances in information technology, increasing internet and smartphone penetration, and increasing public demand for fast, efficient, and easily accessible financial services anytime and anywhere.

Fintech growth is also supported by increasingly adaptive regulations and high investor interest in this sector. In many countries, governments and financial authorities are beginning to encourage the fintech ecosystem through financial inclusion policies and the establishment of *regulatory sandboxes* [4]. Reports from various global financial institutions show that investment in the fintech sector continues to increase every year, with a focus on technologies that prioritize artificial intelligence, *blockchain*, and *big data analytics*. Fintech not only provides an alternative to traditional financial services, but also creates new business models that are more dynamic and responsive to changing consumer behavior [5]. Therefore, this phenomenon has become the center of attention in contemporary research in the fields of economics, management, and financial technology.

Digitalization in the financial sector has had a significant impact on changing consumer behaviour in accessing, using, and managing financial services. Today's consumers tend to choose financial services that are fast, easy, personalized, and accessible in real-time through digital devices. Transactions that were previously carried out conventionally at bank offices are now largely switched to mobile banking applications, digital wallets (*e-wallets*), and QR code-based payment platforms [6]; [7]. The process of storing funds has also undergone a transformation, where the use of traditional savings accounts has begun to compete with digital instruments such as *e-money* and personal financial management applications. This change shows a shift in consumer preferences from the traditional financial system to a more practical and flexible system, in line with the modern lifestyle that demands efficiency and convenience.

In addition to transactions and storage, digitalization has also changed the way consumers access loans and invest [8]. *Peer-to-peer lending* platforms allow individuals to obtain loans faster and without complex banking procedures. On the other hand, digital investment applications provide access to the wider community to invest in the capital market, mutual funds, and crypto assets with relatively small capital and a simple

Volume 09, Number 01, Page 146-150
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process. Information disclosure, transparency, and educational features offered by fintech have also increased people's financial literacy and participation [9]. This phenomenon shows that technology is not only speeding up financial processes, but also shaping a new mindset in consumer financial decision-making. Thus, the role of digitalization in shaping modern financial behaviour is becoming increasingly important to be studied in depth.

The development of financial technology has been a significant source of disruption for the traditional banking system [10]. Conventional banking services, which have relied on physical systems, complex administrative procedures, and limited operating hours, are now facing the great challenge of the presence of fintech that offers speed, convenience, and efficiency. Fintech has shifted consumers' expectations of financial services, forcing banks to revisit their business models to stay competitive [11]. This challenge is not only related to the loss of market share, but also concerns data security issues, compliance with information technology regulations, and the ability of banking institutions to adopt new technologies quickly and effectively. Banks that are slow to transform are at risk of declining relevance amid an increasingly digital and decentralized financial landscape [12].

However, behind these challenges, there is a great opportunity for the banking industry to develop through strategic digital transformation. Many banks are now starting to invest in digital technologies such as *mobile banking*, *cloud computing*, *big data analytics*, and artificial intelligence to improve operational efficiency and service quality [13]. Collaboration between banks and fintechs is also becoming an increasingly popular model, allowing for the integration of traditional institutional trust with modern technological innovations. Digital transformation not only creates internal efficiency, but also opens up new avenues to reach segments of society that have not been optimally served (*unbanked* and *underbanked*). Therefore, banks that are able to combine their traditional advantages with innovative technologies have a great opportunity to maintain competitiveness and create added value in the digital financial ecosystem.

Although the literature on financial technology (fintech) has grown rapidly in the past decade, most of the studies conducted are still individual and fragmented. These studies typically focus on specific cases, specific geographic regions, or specific types of fintech, resulting in findings that are varied and difficult to compare directly. Research shows that fintech significantly increases financial inclusion [14], while other studies highlight cybersecurity risks and digital inequality as negative consequences of fintech adoption (Arner et al., 2017). This diversity of findings creates a gap in understanding the general patterns and power of fintech's influence on consumer behavior and the transformation of banking services as a whole.

To overcome this fragmentation, the meta-analysis approach is important because it allows researchers to combine quantitative data from various empirical studies to obtain a more holistic and generalized picture. Meta-analysis can identify the aggregate effect of fintech on key variables such as digital transaction preferences, adoption of technology-based financial services, and banking operational efficiency [15]. In addition, this approach also allows for the exploration of moderators such as regions, types of fintechs, and consumer demographic characteristics that might influence the strength of the observed effects. Unfortunately, until now there are still very limited studies that use meta-analysis approaches in the context of fintech, so systematic and comprehensive scientific efforts are needed to bridge this gap (Gomber et al., 2018; Milian, Spinola & de Carvalho, 2019). Based on this, this study aims to evaluate the impact of financial technology on consumer behaviour and banking services through a meta-analysis approach.

II. RESEARCH METHODS

This study uses a meta-analysis approach to systematically and quantitatively evaluate the influence of financial technology (fintech) on consumer behavior and banking services. Meta-analysis was chosen because it was able to integrate findings from various relevant empirical studies, in order to produce more accurate and generalized effect estimates. This meta-analysis process began with a literature search using academic databases such as Scopus, Web of Science, Google Scholar, and ScienceDirect, with keywords such as "fintech", "consumer behavior", "digital banking", and "financial services". The inclusion criteria include articles published in the period 2019–2024, in English or Indonesian, and present relevant quantitative data (e.g. effectiveness values, correlation coefficients, or other effect measures). The results of data selection were obtained from 12 relevant studies.

The next stage is the process of data coding and statistical analysis. Each article that meets the criteria will be analysed for effect size, such as *Cohen's d*, *r*, or *odds ratio*, which is then converted to standard form for comparison between studies. Heterogeneity tests were performed to measure the degree of variation between studies, and random-effects models were used if the heterogeneity was high enough. In addition, a moderator analysis was conducted to identify variables that may affect the power of fintech's influence, such as the study area, the type of financial technology, and consumer characteristics. To avoid publication bias, a *plot funnel* test and *Egger's regression* analysis were also carried out. With this method, the research aims to provide a more complete and reliable picture of the impact of fintech in driving consumer behavior transformation and banking service innovation. The effect size value criteria in this study can be seen in Table 1.

Tabel 1. Criterion Nilai Effect Size

Effect Size	Criteria
0.0≤ Effect Size ≤ 0.20	Poor
0.21≤ Effect Size ≤ 0.50	Small
0.51≤ Effect Size ≤ 0.10	Medium
1,11 ≥ Effect size	Strong

Source:(Ayaz & Söylemez, 2015; Zulyusri et al., 2023)

III. RESULT AND DISCUSSION

Volume 09, Number 01, Page 146-150
e-ISSN: 2598-120X; p-ISSN: 2598-117X

All Based on the results of data search through the database, 12 studies/articles met the inclusion criteria. The effect size and error standard can be seen in Table 2.

Table 2. Effect Size and Standard Error Every Research

Journal Code	V_Z	Z	SE_Z
AR 1	0.00781	0.22	0.10
AR 2	0.01092	0.57	0.18
AR 3	0.04821	0.91	0.35
AR 4	0.05623	0.83	0.37
AR 5	0.00351	1.09	0.18
AR 6	0.00297	0.88	0.28
AR 7	0.06114	1.43	0.30
AR 8	0.05882	0.82	0.22
AR 9	0.05704	1.24	0.30
AR 9	0.02548	0.76	0.29
AR 10	0.00100	0.65	0.15
AR 11	0.03952	0.48	0.15
AR 12	0.04871	0.81	0.20

Based on Table 2, the effect size value of the 12 studies ranged from 0.22 to 1.43. According to Borenstein et al., (2007) Of the 12 effect sizes, 5 studies ad medium criteria effect sizes and 7 studies had high criteria effect size values. Based on the results of the data test based on JASP outputs, the following results were obtained:

3. 1 Heterogeneity Test

Furthermore, analyze the heterogeneity test of the ten analyzed studies which can be seen in Table 3.

Table 3. *Resiadual Heteroneity test*

Q_e	df	P
39.192	12	< 0.001

Based on Table 3. The results of the heterogeneity test analysis showed that 10 researchers had a heterogeneous distribution (QC = 39,192; P < 0.001). With this, random effect size is effective to estimate the average effect size of the 12 studies analyzed. The findings explain fintech significantly affects consumer preferences and loyalty.

3.2 Hypothesis Test

Next, calculate the p-value to test the hypothesis through the random effect model. The results of the summary effect model analysis with the random effect model can be seen in Table 4.

Tabel 4. *Pooled Effect Size Test*

Estimate	Standard error	t	df	P
0.765	0.091	8.427	11	< 0.001

Table 4. The results of the analysis of the average value of effect size with the random effect model Fintech significantly affects consumer preferences and loyalty (t = 8.427; p< 0.001).

3.3 Publication Bias

Checking publication bias through funnel plot analysis and Rosenthal fail safe N (FSN) test (Tamur et al., 2020; Badawi et al., 2022; Ichsan et al., 2023b; Borenstein et al., 2007). The results of checking publication bias with funnel plot can be seen in Figure 1

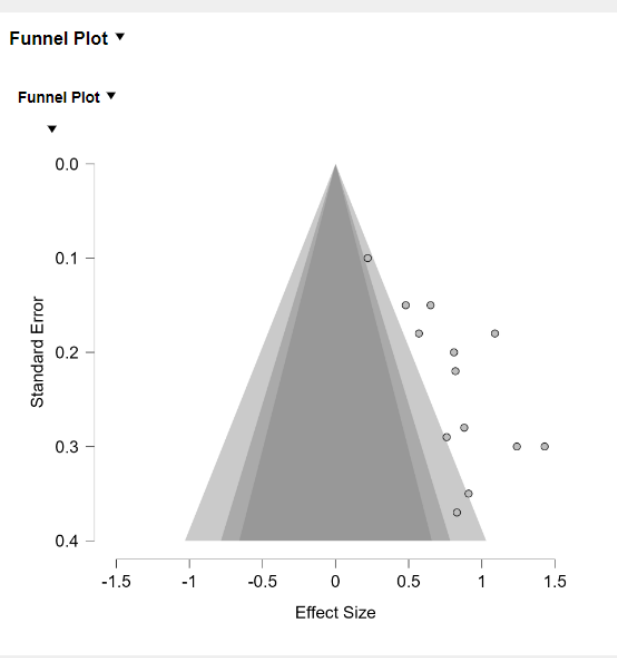

Figure 1. Funnel Plot

Based on Figure 1, the analysis of the funnel plot is not yet known whether it is symmetrical or asymmetrical, so it is necessary to conduct a Egger's test. The results of the Egger's test calculation can be seen in Table 5.

Tabel 5. Egger's Test

	z	p
Sei	1.044	0.107

Based on Table 5, the Z value is 1.044 and the p-value is 0.107 more than the sig value. 0.05 means that there is no publication bias in this study. Next, the forest plot analysis can be seen in figure 2.

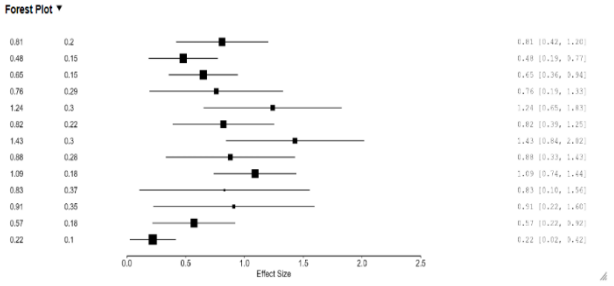

Figure 2. Forest Plot

Based on the forest plot analysis, it can be observed that the analyzed articles have values that vary between 0.22 to 1.43

Volume 09, Number 01, Page 146-150
e-ISSN: 2598-120X; p-ISSN: 2598-117X

with a summary effect size value of 0.692. This finding explains that Fintech significantly affects consumer preferences and loyalty, especially in terms of ease of access, time efficiency, and ease of use. Consumers are increasingly showing a preference for fast, flexible, and digital-based financial services. Services such as digital wallets, online lending applications, and digital investment platforms have increased the convenience and efficiency of transactions, thereby shifting the pattern of consumer interaction with traditional financial institutions [22]; [23]. This positive effect is not only seen in transaction volume, but also in increased financial literacy and inclusion.

The findings also show that banking services have undergone substantial transformation due to fintech disruption. Banks that previously relied on physical transactions are now starting to develop digital services such as mobile banking, AI-based chatbots, and open banking services to stay relevant amid fierce competition [24]. Quantitative data in previous studies reinforce that banking institutions that are quick to adapt to technology have a competitive advantage in retaining customers and improving service efficiency. In other words, fintech has driven the digitalization of a banking system that is more inclusive and responsive to the needs of modern consumers [25].

However, the results of the meta-analysis also revealed that there was a significant variation in effects between studies, depending on factors such as geographical area, digital literacy level, and the type of fintech studied. In developing countries, fintech adoption still faces challenges such as limited digital infrastructure, lack of clear regulation, and low public trust in data security [26]. Meanwhile, in developed countries, fintech plays a more complementary role as a complement to the established banking ecosystem. Therefore, a contextual policy approach is needed in developing and regulating the fintech ecosystem. New risks also arise as fintech develops, such as increased vulnerability to cybercrime, misuse of personal data, and unethical online lending practices [27]. This demands an active role for regulators in shaping legal and consumer protection frameworks that are adaptive to technological dynamics [28] Banks and fintech providers need to collaborate in creating services that are not only innovative, but also secure and reliable. Awareness of this security aspect is key to maintaining the sustainability of the fintech industry's growth and maintaining public trust.

Overall, the results of this study confirm that fintech is not just a technological innovation, but a transformational force that structurally affects the financial ecosystem. Changing consumer behavior and adapting banking services are two sides of the process that affect each other [29]. Therefore, collaboration between regulators, financial institutions, fintech players, and consumers is needed to ensure that the benefits of fintech can be widely felt, with controlled risks and increased financial inclusion. Further research is recommended to examine sustainable models of digital financial services integration, as well as explore their impact on financial system stability on a macro level.

IV. CONCLUSIONS

From the results of this study, it can be concluded that fintech has a significant influence on consumer preferences and loyalty, especially in terms of ease of access, time efficiency, and convenience of use (r = 0.765; t = 8.427) in the medium effect size category. On the other hand, the banking sector showed a diverse response, ranging from strategic collaboration to internal digital transformation. These findings provide important implications for policymakers, financial industry players, and banking institutions in designing adaptive strategies in the digital era. Fintech has led to increased financial efficiency, convenience, and inclusion, which is changing the way consumers interact with the financial system. While fintech offers many benefits, there are challenges related to data security, consumer trust, and the risks posed by a lack of clear regulation. On the other hand, the banking sector is also facing disruption, with many banks starting to adopt digital technologies to maintain their relevance and competitiveness. Therefore, it is important for regulators, financial institutions, and fintech players to work together to create a secure, inclusive, and sustainable ecosystem, to ensure that the positive impact of fintech can be maximized and the risks that may arise can be minimized.

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