T.C.
BAHCESEHIR UNIVERSITY
GRADUATE SCHOOL
THE DEPARTMENT OF ECONOMICS
MASTER'S PROGRAM IN FINANCIAL TECHNOLOGY

THE IMPACT OF DIGITALIZATION ON SUSTAINABILITY PRACTICES AND REPORTING: A STUDY ON THE BANKING SECTOR IN TURKEY

MASTER'S THESIS

TAHA KOTİL

ISTANBUL 2025

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ABSTRACT

THE IMPACT OF DIGITALIZATION ON SUSTAINABILITY PRACTICES AND REPORTING: A STUDY ON THE BANKING SECTOR IN TURKEY

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Master's Program in Financial Technology

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This study aims to examine the issues of digitalization and sustainability, which have been frequently encountered in recent years. The primary research question of the study is to investigate how digitalization has impacted sustainability practices and reporting in the Turkish banking sector. Qualitative research method were used in the study, and semi-structured interviews were conducted with thirteen senior executives from nine banks, including four state and five private banks, representing deposit, development and investment, and participation banks in the Turkish banking sector. The data obtained from the interviews were evaluated using thematic analysis. The study revealed that banks in the Turkish banking sector have a high level of digital maturity, that sustainability-related questions are asked during the lending process, and that international funds consider sustainability criteria to be mandatory in the lending process. While the impact of digitalization on sustainability practices is significant, its effect on reporting is not yet at the desired level, despite its high potential. In conclusion, the future impact of digitalization on sustainability practices and reporting in the Turkish banking sector will depend on the maturation of institutional and legal frameworks.

Key Words: Digitalization, Sustainability, Sustainable Banking, Turkish Banking Sector

ÖZET

DİJİTALLEŞMENİN, SÜRDÜRÜLEBİLİRLİK UYGULAMALARINA VE RAPORLAMALARINA ETKİSİ, TÜRKİYE'DE BANKACILIK SEKTÖRÜ ÜZERİNE BİR ÇALIŞMA

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Bu çalışmada, son yıllarda tüm dünyanın gündeminde olan dijitalleşme ve sürdürülebilirlik konularının Türkiye bankacılık sektörüne etkilerinin incelenmesi amaçlanmıştır. Çalışmanın temel araştırma sorusu, dijitalleşmenin Türkiye bankacılık sektöründeki sürdürülebilirlik uygulamaları ve raporlamalarını nasıl etkilediğini ortaya koymaktadır. Araştırmada nitel araştırma yönteminden faydalanılmış olup Türkiye bankacılık sektöründe yer alan mevduat, kalkınma ve yatırım ile katılım bankası türlerini temsil eden, dört kamu ve beş özel banka üzere toplamda dokuz bankadan on üç üst düzey yönetici ile yarı yapılandırılmış mülakatlar yapılmıştır. Mülakatlar sonucunda elde edilen veriler tematik analiz ile değerlendirilmiştir. Çalışma sonucunda Türkiye bankacılık sektöründe yer alan bankalarının dijital olgunluk seviyesinin yüksek olduğu, kredi verme süreçlerinde sürdürülebilirlikle ilgili soruların sorulduğu ve uluslararası fonlar sürdürülebilirlik kriterlerinin kredi verme sürecinde zorunluluk olduğunu ortaya çıkarmıştır. Dijitalleşmenin sürdürülebilirlik uygulamalarında etkileri oldukça önemliyken raporlama tarafındaki etkisinin istenilen düzeyde değildir ama potansiyelinin yüksek olduğu görülmüştür. Sonuç olarak gelecekte dijitalleşmenin Türkiye bankacılık sektöründe sürdürülebilirlik uygulamalarına ve raporlamalarında daha çok etkisinin olması kurumsal ve yasal çerçevelerinin olgunlaşmasına bağlı olduğu görülmüştür.

Anahtar Kelimeler: Dijitalleşme, Sürdürülebilirlik, Sürdürülebilir Bankacılık, Türk Bankacılık Sektörü

To my wife and my family

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
ATM	Automated Teller Machine
CDP	Carbon Disclosure Project
ESG	Environmental, Social, and Governance
IoT	Internet of Things
ISO	International Organization for Standardization
ISO 14001	Environmental Management System Certificate
ISO 50001	Energy Management System Certificate
KGK	Public Oversight Accounting and Auditing Standards Authority
KYC	Know Your Customer
LEED	Leadership in Energy and Environmental Design
ML	Machine Learning
OCR	Optical Character Recognition
RPA	Robotic Process Automation

SBTi	Science Based Target Initiative
SDGs	Sustainable Development Goals
TBB	The Banks Association of Türkiye
TKBB	Participation Banks Association of Türkiye
TSRS	Turkey Sustainability Reporting Standards
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WCED	World Commission on Environment and Development
WWF	World Wide Fund for Nature

Chapter 1

Introduction

Nowadays, with the rapid development of technology, we have seen the beginning of digital transformation in every sector. Thanks to digital transformation, we observe that users are performing their transactions faster and more easily. The increasing demand for convenience and fast transactions has been a key driver of the rapid progress in digital transformation. One of the issues arising from the increasing demand for consumption by people is the rapid depletion of our underground and above-ground resources.

These days, the world's resources are scarcer than ever, and the concept of sustainability comes to mind when we think about saving our resources and ensuring their transfer from one generation to the next. Both the conscious protection of our resources and our desire to accomplish tasks more efficiently have made digitalization and sustainability crucial in our lives today. These two issues have become important in all areas of life. Every step we take towards sustainability and digitalization will be a gift to future generations.

Like other sectors, companies in the banking sector have also focused on digitalization and sustainability in order to gain a competitive advantage and achieve environmental, social, and economic benefits.

With the advancement of digitalization in the banking sector, we have seen that many manual tasks that used to take a long time to complete have been digitized, and many paper-based tasks have been transferred to electronic platforms. In the past, even for simple banking transactions, we had to visit bank branches during the day. However, now we can perform banking transactions more quickly through mobile banking applications or computers.

As a result, the digital transformation in the banking sector has reduced people's use of paper, thereby reducing their environmental footprint while making operational tasks more efficient. When considering the banking sector in Turkey, it is evident that digitalization has been increasing year by year. Many banks have begun transforming their physical branches into online branches, and some now offer services without any physical locations. In short, all banks are implementing applications to transfer their

banking activities from physical transactions to online transactions in order to maintain their advantage in the sector and gain a larger market share (Ulusoy & Demirel, 2022).

Thanks to the developing digitalization applications in the banking sector, banks have fewer physical branches, and some banks do not have any branches at all, which reduces their consumption of electricity, natural gas, water, and waste. As a result of reduced consumption, banks emit fewer emissions.

Lower emissions contribute positively to the environmental footprint while also saving time for both bank employees and customers. In addition to these positive effects, banks are also able to avoid many costs, and thanks to digitalization, they directly contribute to achieving the some of the Sustainable Development Goals (SDGs) such as industry, innovation, and infrastructure (SDG 9), responsible consumption and production (SDG 12), climate action (SDG 13).

Banks that reduce their environmental footprint and save money are seeing positive effects in their sustainability practices within the organization and are becoming more environmentally friendly in their sustainability reporting.

While there are positive aspects to this digitalization in the banking sector, there are also negative aspects. Some customers do not trust banking applications during this digital transformation and prefer to visit branches to carry out transactions, considering them a more secure and transparent method.

In addition to transparency and trust, digitalization is also considered to be harmful to sustainability. With the innovations brought about by the digitization process, the transfer of transactions that were previously carried out on paper or required a physical visit to a branch to online environments has led to an increase in electronic waste from phones or computers and the increased load on data centers.

In addition to the environmental impact, considering the effect of digitalization on the social aspect of sustainability, issues such as the closure of bank branches and the reduced need for employees due to digital transformation are causing concerns about job security among some bank employees.

Researchers believe that the security concerns, transparency issues, and job security concerns worldwide have a negative impact on sustainability practices and reporting in the banking sector (Jimmy, 2024).

In short, while some people believe that digitalization in banking operations has a positive impact on banks' sustainability practices and reporting, others believe that it

has a negative impact. In this context, this study aims to examine the impact of digitalization on the sustainability practices and reporting of banks in the Turkish banking sector.

Chapter 2

Literature Review

With the rapid advancement of technology and the growing importance of digitalization and sustainability, many studies have been conducted in the field of sustainability in recent years. In this study, we will focus on the impact of digitalization on sustainability in the banking sector. In the literature review, studies related to digitalization in the banking sector, the history of sustainability, sustainability practices, sustainability reporting in the banking sector, and the impact of digitalization on sustainability in the banking sector were examined.

2.1 Digitalization in the Banking Sector

The term digitalization refers to the process of converting existing information into digital form. As a result of this process, an object or document is represented by a series of numbers (Harchekar, 2018). Digital transformation is the intensive use of information technologies to enhance the development of activities within an organization, increase its market share, and provide operational benefits while also enhancing its profitability (Shanti, Avianto, & Wibowo, 2022).

With the impact of digitalization in the banking sector, we observe that manual tasks performed by bank employees are beginning to be automated, traditional banking services are being provided to customers using smart devices such as smartphones and computers without the need for branches or paper transactions, and physical transactions are being transferred to digital platforms (Haksever & Baykal, 2023).

Thanks to digital transformation, customers can now perform many tasks digitally through applications, such as managing their accounts, transferring money, applying for cards, applying for loans, managing their investments, opening accounts, paying bills, and managing checks. Thanks to chatbots and AI-driven virtual advisors, customers can now receive investment advice that they would typically receive from a human advisor in a matter of seconds, all within a digital environment, and can even make investments easily using a smart device (Malyshev, 2025).

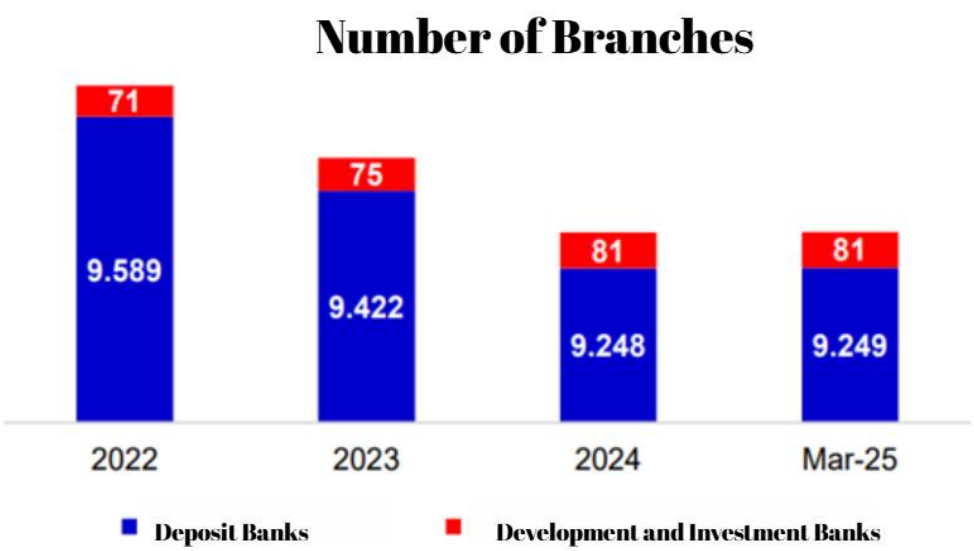

Figure 1. Number of Branches in the Turkish Banking Sector (TBB, 2025).

There are 67 banks in the banking system in Turkey. Of these 67 banks, 38 are deposit banks, 20 are development and investment banks, and 9 are participation banks. As seen in Figure 1, when examining the statistics on the number of bank branches in Turkey over the past four years, there were 9,589 deposit bank branches and 71 development and investment bank branches in 2022, while this number decreased to 9,249 deposit bank branches and 81 development and investment bank branches in March 2025 (The Banks Association of Türkiye, 2025).

With the advancement of digitalization in the banking sector, we have started to hear about different types of banks. Digital banks, which operate entirely online without physical branches, have become more competitive due to a decrease in their operational costs. The increasing demand for digitalization on the customer side, combined with the fact that digitalization is more advantageous and competitive for banks, is expected to lead to a significant rise in the number of digital banks in the future. Traditional banks, on the other hand, are expected to close their physical branches and transition to digital branches, resulting in a significant decrease in the number of physical branches (Haksever & Baykal, 2023).

The first digitalization in the history of banking began in 1946 with the introduction of the bank card. One of the most important digital developments, the automated teller machine (ATM), appeared in 1967. With the advent of ATMs, customers could now withdraw money at any time without needing a bank employee.

This revolutionary development has earned a significant place in the history of digitalization in the banking sector. In 1983, the first internet banking services were launched. By 1999, mobile banking had begun with SMS banking, which differed from today's mobile banking applications. By the end of 2020, the number of digital banking users had reached 1.9 billion (Participation Banks Association of Türkiye, 2022).

Looking at the history of digital banking in Turkey, Internet banking first emerged in 1997, followed by mobile banking services in 2005. One of the important steps in the field of digitalization was the establishment of the first digital bank in Turkey in 2012. The first remote customer acquisition in Turkey began in May 2021. From May 2021 to December 2021, the percentage of customers acquired through digital channels was 24.1%, while the percentage of customers acquired through branches was 75.9%. By 2024, the number of customers acquired through physical branches is expected to fall behind the number of customers acquired through digital channels for the first time in history (Strategy&, 2025).

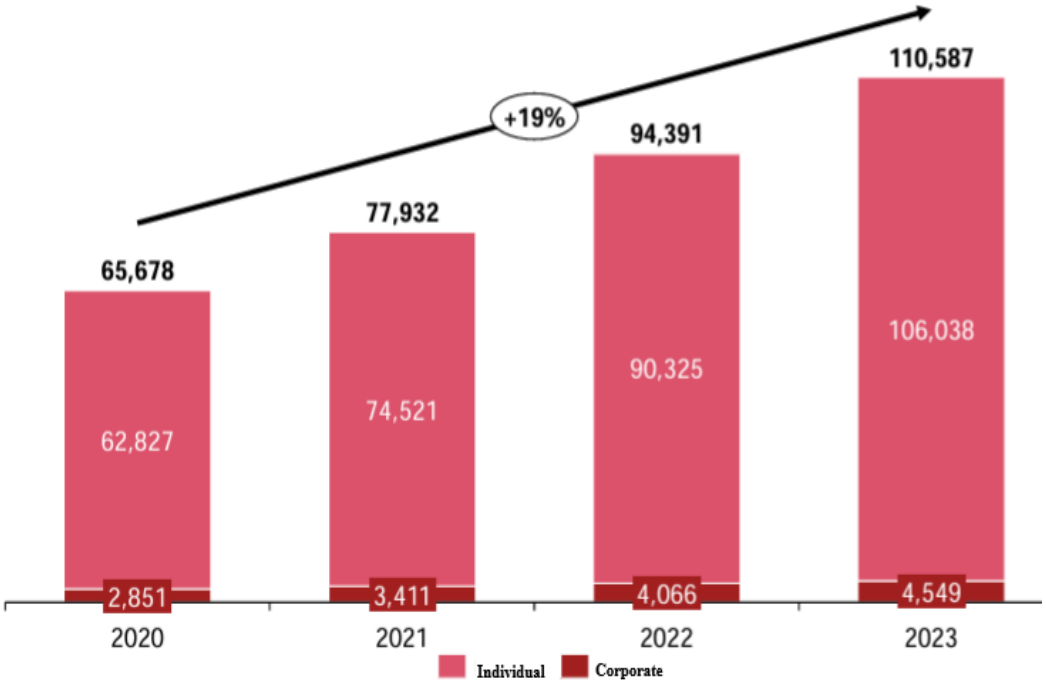

Figure 2. Increase in Active Customers in Digital Channels in the Banking Sector (2020-2023, in thousands) (Strategy&, 2025).

As shown in Figure 2, the number of active customers using digital channels, specifically internet and mobile banking applications, increased from 65,678,000 in

2020 to 110,587,000 by the end of 2023. The increase in the number of active digital banking application users is prompting the banking sector to invest more in this area (Strategy&, 2025).

One of the crucial moments in the digital transformation of the banking sector was the COVID-19 pandemic, which had a profound impact on the entire world. With the emergence of the COVID-19 pandemic, customers began conducting their transactions more frequently through digital channels, as they were unable to leave their homes. In line with the increasing demand for digital banking transactions, banks are investing more in digitalization. By 2025, in addition to the digitalization of banking transactions, banks will have begun to place greater emphasis on customer experience and focus on increasing their operational efficiency (Deloitte, 2025).

Reports published by the Turkish Banking Association show that digitalization is on the rise in the banking sector in Turkey. According to a study prepared by the Turkish Banks Association, based on needs a reference data from 30 banks offering internet banking services and 24 banks offering mobile banking services, the number of individual and corporate active digital banking customers increased by approximately 6% over the past year, reaching 120 million people between March 2024 and March 2025 (The Banks Association of Türkiye, 2025).

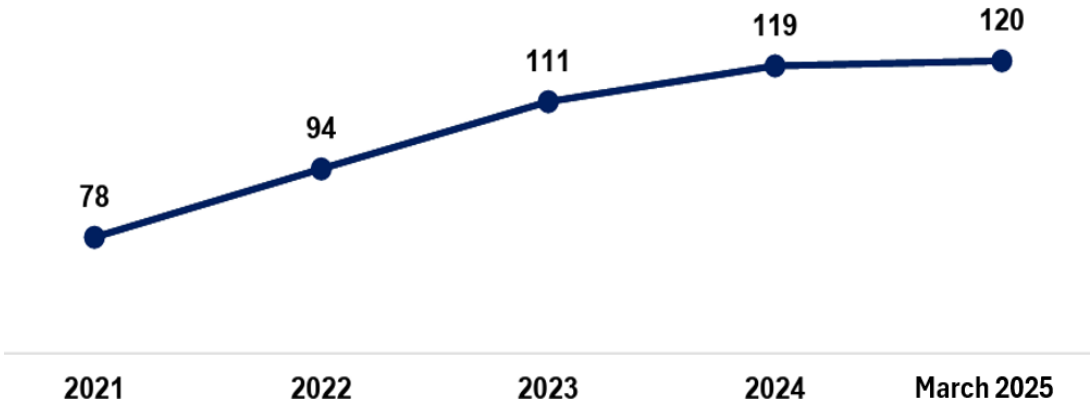

Figure 3. Number of Uniquely Identified Active Digital Banking Customers (million people) (TBB, 2025).

Thanks to internet banking, customers can easily carry out various financial transactions, such as money transfers, payments, stock purchases, gold purchases, foreign exchange transactions, and card transactions, in a very short time. In Turkey,

between January and March 2025, the total number of financial transactions conducted via internet banking reached 98 million, with a transaction volume of 15 trillion Turkish Liras (The Banks Association of Türkiye, 2025).

Table 1

Financial Transactions in Internet Banking (TBB, 2025).

	Jan-Mar 2024 Number of Transactions (Million)	Jan-Mar 2024 Transaction Volume (Billion TL)	Oct-Dec 2024 Number of Transactions (Million)	Oct-Dec 2024 Transaction Volume (Billion TL)	Jan-Mar 2025 Number of Transactions (Million)	Jan-Mar 2025 Transaction Volume (Billion TL)
Money transfers	72	7.826	66	11.117	60	11.353
Payments	21	473	18	664	18	643
Investment transactions	18	1.677	13	2.377	13	2.681
Credit card transactions	5	146	4	206	4	206
Other financial transactions	4	329	4	444	4	410
Total	**120**	**10.451**	**105**	**14.808**	**99**	**15.293**

When comparing the same periods of the previous year, it is evident that the number of transactions made in January-March 2024 was higher than in January-March 2025; however, the transaction volume was higher in January-March 2025. Examining the comparison data for the same period reveals that the volume has increased in every branch of financial transactions (The Banks Association of Türkiye, 2025).

A study conducted by Strategy&, examining why customers in the Turkish banking sector choose to work with digital banks, highlights the top three factors: ease of use, cost-free transactions, and time savings. Customers can conduct quick and practical transactions without needing to visit a branch, saving time and encouraging them to move away from traditional banking systems and toward digital banks. When examining the reasons why customers who do not use digital banks prefer not to, the top three reasons are as follows: insufficient information, the absence of branches, and customers not finding digital banks trustworthy (Strategy&, 2025).

Let us examine the advantages of banks' investments in digitalization. Banks are reducing their operational costs, minimizing the likelihood of errors made by bank

employees, and reaching more customers faster through digital channels. This enables them to gain access to more data, which can be utilized to develop banking applications (Harchekar, 2018).

We see that the key technologies playing a role in the digitalization process in the banking sector are artificial intelligence (AI) & machine learning (ML), big data analytics, blockchain technology, cloud computing, APIs & open banking, the Internet of Things (IoT), and cybersecurity.

Thanks to artificial intelligence and machine learning, banks can understand the services their customers need and analyze their transactions and history to identify potential risks, such as fraud, in advance. AI-powered chatbots have been observed to enable customers to quickly perform many transactions without the need for a bank employee. Artificial intelligence enables banks to credit score customers by using their past transaction data. By examining the money transfers made by customers, it is possible to determine whether any suspicious activity is occurring, whether a financial crime has been committed, and whether money laundering activities are taking place. With AI, banks can review documents uploaded by customers through digital channels and analyze their authenticity. AI algorithms can also make investment predictions in financial markets by collecting information on current market data, past data, and recent developments (Jain, 2023).

Big data analytics has become a crucial technology in the digital transformation of the banking sector. Banks process a large number of transactions every day, and big data analytics technology plays a crucial role in analyzing these transactions and drawing meaningful conclusions. It is beneficial for banks in analyzing both their deposit-providing customers and their credit-granting customers. In addition, banks that utilize big data analytics in customer acquisition gain more information about potential customers and can increase customer acquisition numbers more quickly and securely. In the past, all customers visited bank branches, allowing branch employees to build personal relationships with customers and understand their risk tolerance and banking product needs. With the increasing number of banking customers today, building such relationships has become more challenging. Thanks to the use of big data analytics, banks can establish relationships with millions of customers, understand their risk appetite, and determine which banking products they may potentially need (Abraham, Schmukler, and Tessada, 2019).

Blockchain technology is one of the most recent innovations. With the introduction of blockchain technology into our lives, we have come to understand that data can be stored in a decentralized manner within a digital environment. Like all technologies, it has its weaknesses, but it makes a positive contribution to the banking sector. Cryptocurrencies, which have entered our lives through blockchain technology, have created a new potential market for banks, prompting them to invest in cryptocurrency trading platforms. In addition to cryptocurrency trading, banks that utilize blockchain technology are preventing fraud in manual and verification processes by using smart contracts in trade finance. Additionally, blockchain technology has the potential to provide greater transparency in the Know Your Customer (KYC) process because data processed on the blockchain is immutable and cannot be deleted (OMFIF, 2020).

2.2 Sustainability Concept History

The definition of sustainability that is universally accepted was first introduced into our lives as "sustainable development" in 1987 by the World Commission on Environment and Development (WCED) operating within the United Nations (UN) in its report titled "*Our Common Future*." The definition provided is as follows: *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"* (WCED, 1987).

Suppose we interpret the concept of sustainability based on the definition of sustainable development. In that case, we conclude that sustainability means meeting our current needs by using resources in the most efficient manner possible, while also using resources prudently so that future generations can meet their needs without depleting them (WCED, 1987).

When we examine the dimensions of sustainability, three fundamental dimensions emerge. The dimensions of sustainability are environmental sustainability, economic sustainability, and social sustainability. When considering the definition of environmental sustainability, the aim of protecting nature becomes apparent, encompassing the preservation of our natural resources, the mitigation of climate change-related problems, and minimizing environmental harm. The economic

sustainability dimension, on the other hand, is not only about increasing income worldwide, but also about creating prosperity for the entire society by utilizing resources most efficiently, thereby increasing income while supporting social development. Economic sustainability is an approach that considers both social and environmental impacts. The social sustainability dimension focuses on achieving social justice, promoting equality, respecting human rights, and ensuring fair development, while enhancing the quality of life in society (Zeng, Yu, Yang, Lv, and Sarker, 2022).

When examining the historical development of sustainability, we first encounter sustainable forest management in 17th-century Europe, which involved replanting trees to replace those that were cut down. In the mid-20th century, following the Industrial Revolution, the global consumption of natural resources began to increase significantly. This increased consumption brought issues such as pollution and environmental damage to the world's agenda. Following the publication of "Silent Spring," awareness of the environmental and societal damage caused by agricultural pesticides increased at the societal level. With this increased awareness, the UN Conference on Human Environment was held in Stockholm in 1972. At this conference, environmental issues were brought to the international agenda for the first time. One of the most important developments following this was the publication of the Brundtland Report in 1987. In this report, we saw the first definitions of sustainability (Kaman & Bozkurt, 2025).

Following the Brundtland Report, the UN Framework Convention on Climate Change, a significant global agreement focused on global sustainability, was signed at the UN Conference on Environment and Development held in Rio de Janeiro in 1992 (United Nations, 1992).

By 2000, the United Nations Millennium Declaration was signed, and plans and targets were published for developing countries to follow. In 2002, the World Summit on Sustainable Development was held. The aim of the summit was for each country to design its plans and programs to prioritize sustainable development and to implement them by 2005 (Kaman & Bozkurt, 2025).

One of the important developments in the history of sustainability is the Kyoto Protocol. Although the Kyoto Protocol was adopted on December 11, 1997, it entered into force on February 16, 2005. What makes the Kyoto Protocol important is that it

includes commitments from industrialized countries and is a protocol to which 191 countries are party. Within this scope, the protocol's objective is for industrialized countries to implement and adopt emission reduction policies and to report on their reduction status at regular intervals. The Kyoto Protocol's commitment periods covered the first period from 2008 to 2012 and the second period from 2013 to 2020, and the protocol officially ended on December 31, 2020. The Kyoto Protocol was replaced by the Paris Agreement, signed in 2015 (Atabey & Toprak, 2024).

The Paris Agreement is an international agreement under the United Nations Framework Convention on Climate Change (UNFCCC). The primary objective of the agreement is to prevent global warming and strive to keep the global temperature increase below 2 degrees Celsius, preferably 1.5 degrees Celsius. What distinguishes this agreement from the Kyoto Protocol is that it includes emission reduction targets for all countries, including developed and developing nations (Atabey & Toprak, 2024).

In 2015, the United Nations General Assembly adopted 17 Sustainable Development Goals (SDGs). To eradicate poverty, fight inequality and injustice, and address climate change by 2030, the 17 SDGs were adopted with 169 indicators. Today, many companies report on the SDGs to which they contribute (Arora & Mishra, 2019). The following Figure 4 shows the 17 SDGs.

Figure 4. Sustainable Development Goals (United Nations, 2025).

2.3 Sustainability Applications in the Banking Sector

The importance of sustainability practices in the banking sector lies in their ability to reduce a bank's costs, increase operational efficiency, and encourage customers to prefer banks that prioritize sustainability. In Turkey, there are 23 banks with an operational unit responsible for sustainability in the banking sector, 13 banks with employees working exclusively in the field of sustainability, 10 banks with employees working in areas other than sustainability but also responsible for sustainability, and 18 banks with units involved in sustainability that report to the bank's board of directors. (The Banks Association of Türkiye, 2024).

Sustainability has affected every sector, including the banking sector, giving rise to the concept of sustainable banking. Sustainable banking refers to a bank's commitment to pursuing not only a profit-oriented strategy but also conducting its operations by Environmental, Social, and Governance (ESG) criteria. Given the banking sector's transformative power to finance across all sectors, it plays a crucial role in promoting sustainability. Consequently, sustainability-related activities in the banking sector have a ripple effect on all other sectors.

Among the sustainability practices implemented by banks in their corporate and operational aspects are reducing carbon footprints, resource management, supply chain optimization, and reporting. Currently, the Turkish banking sector comprises a total of 67 banks and 3,330 bank branches (The Banks Association of Türkiye, 2025).

In their sustainability efforts on the operational side, banks prefer energy-efficient systems in their headquarters and branches. This helps them reduce energy costs and lower their carbon footprint. In addition to energy efficiency, banks are reducing paper consumption by digitizing many tasks that previously required paper output. As an example from the Turkish banking sector, Halkbank has taken a revolutionary step in the lighting of its branch signs. By keeping the signs of its branches turned off, Halkbank has achieved an annual electricity savings of approximately 2.5 million kWh, thereby aiming to reduce its carbon emissions by 800 tCO2e (Halkbank, 2025).

Some banks in the Turkish banking sector hold certifications, such as those from the International Organization for Standardization (ISO), to reduce their environmental footprint. According to a study conducted by the Banks Association of

Turkey (TBB) in 2022, a total of 12 banks hold the Environmental Management System (ISO 14001) certificate, four banks hold the Greenhouse Gas Management (ISO 14064) certificate, and five banks hold the Energy Management System (ISO 50001) certificate. The same study also shows that one bank has been awarded the WWF Green Office Diploma. In comparison, one bank has received a platinum certificate, nine banks have received gold certificates, and one bank has received a silver certificate in the Leadership in Energy and Environmental Design (LEED) certification (The Banks Association of Turkey, 2024).

Emissions calculations are performed to measure the impact of sustainability in concrete terms in terms of its environmental dimension. According to the internationally recognized GHG Protocol, emissions are categorized as scope 1, scope 2, and scope 3. Scope 1 emissions refer to emissions directly caused by a company, while scope 2 emissions refer to emissions caused by a company through its purchases. Scope 3 emissions, unlike scope 1 and 2, are emissions that arise from the value chain. Taking the banking sector as an example, Scope 1 emissions for banks could include natural gas and air conditioning used at service locations. Scope 2 emissions may consist of electricity purchased for use at service locations. Examples of Scope 3 emissions in banking include employee travel, paper used for business purposes, employee use of services, and emissions generated by activities financed by the bank. Calculating financed emissions under Scope 3 is more challenging than calculating other emissions (Takahashi & Shino, 2023).

Banks in the Turkish banking sector integrate sustainability, which they consider important in operational terms, into their policies and strategies. According to a 2022 study conducted by the TBB, 28 banks have publicly shared written documents on sustainability. In the relevant documents, 16 banks have included national and international commitments and targets and mentioned their support for the UN Sustainable Development Goals. A total of 13 banks have mentioned commitments to reduce Scope 1-2 emissions, while eight banks have included statements regarding the reduction of Scope 3 emissions. Eleven banks have made commitments to phase out coal, and three banks have published policies on financing hydroelectric power plants. Nine banks in Turkey calculate and track SDG-linked loans (The Banks Association of Türkiye, 2024).

The banking sector in Turkey manages climate-related financial risks as part of its efforts to address climate change. The studies reveal that a total of 20 banks take climate-related risk management processes into account, 12 banks have a written strategy or policy on this matter, and 10 banks have clearly defined the impact of climate-related risks on the bank's risk management (The Banks Association of Türkiye, 2024).

Banks offer a wide range of products and services under the umbrella of sustainable finance. Examples of these financing types include green bonds, social bonds, and sustainability bonds, all of which fall under the bond category. Under the loan category, there are sustainability-linked loans, as well as services such as sustainability-themed investment funds.

Financial products linked to sustainability by banks are only used to finance activities related to sustainability. For example, the money raised through sustainability-linked bonds cannot be used for activities that do not contribute to sustainability. Thanks to customer demand for sustainable finance products, the number of such products is increasing every day.

In Turkey, some banks integrate sustainability risks into their credit-granting processes, alongside environmental and social risk assessments. According to 2022 data, a total of 19 banks conduct environmental and social risk assessments in their credit-granting processes. Among these 19 banks, the credit-granting processes of two banks are directly influenced by the environmental and social assessment scores of their customers. The 19 banks have subjected a total of 12.952.000.000 TL in loans to environmental and social risk assessment. The proportion of high-risk, medium-risk, and low-risk loans, as determined by environmental and social assessments, was approximately 65%, 19%, and 17%, respectively (The Banks Association of Turkey, 2024).

2.4 Sustainability Reporting in the Banking Sector

Sustainability initiatives, reporting, and commitments in the Turkish banking sector vary considerably at the national and international levels. While some reports are mandatory for banks in the Turkish banking sector, others are voluntary. The

primary purpose of reporting is to make banks more transparent and accountable in the eyes of their customers and investors, thereby generating positive effects for the banks.

Turkish banks used to publish sustainability reports voluntarily. Some banks published their sustainability reports together with their activity reports as integrated activity reports, while others published separate sustainability reports. In the past, banks in Turkey were not required to publish sustainability reports; however, as of January 1, 2024, mandatory sustainability reporting, i.e., compliance with the Turkey Sustainability Reporting Standards (TSRS), has been published in the official gazette. TSRS is divided into two parts: TSRS 1, General Provisions on the Disclosure of Sustainability-Related Financial Information, and TSRS 2, Climate-Related Disclosures (KGK, 2024).

When evaluating the reporting, initiatives, and commitments in the Turkish banking sector at the national level, 15 banks are part of the TBB working group, nine banks are part of the Borsa Istanbul Sustainability Index, 12 banks are part of the Business World and Sustainable Development Association, eight banks are part of the UN Global Compact – Turkey Sustainable Finance Declaration, seven banks are part of the Integrated Reporting Turkey Network, eight banks are members of the Turkish Corporate Governance Association, five banks are affiliated with the Turkish Foundation for the Protection of Nature, four banks are part of the Impact Investment Advisory Board, and one bank is a member of the Energy Efficiency Association (The Banks Association of Türkiye, 2024).

At the national level, based on 2022 data, Garanti Bankası ranks first with 15 reports, Turkey Sınai Kalkınma Bankası ranks second with 13 reports, and Yapı ve Kredi Bankası ranks third with 11 reports in terms of reporting, participation in platforms, and commitments (The Banks Association of Turkey, 2024).

When looking at international reporting, initiatives, and commitments made abroad, 15 banks from Turkey are listed in the Carbon Disclosure Project (CDP), 12 banks in the UN Global Compact, 13 banks in the Women's Empowerment Principles, nine banks in the Science Based Target Initiative (SBTi), eight banks to the Net Zero Banking Alliance, nine banks to the Global Reporting Initiatives, six banks to the Task Force on Climate-Related Financial Disclosures, nine banks to the United Nations Environment Programme Finance Initiative, eight banks to the United Nations Principles for Responsible Banking, six banks to the International Integrated Reporting

Council, three banks to the Equator Principles, and two banks to the United Nations Principles for Responsible Investment in terms of reporting, making commitments, or participating in platforms (The Banks Association of Türkiye, 2024).

According to 2022 data, private deposit banks stood out in terms of reporting, initiatives, and commitments in the Turkish banking sector (The Banks Association of Türkiye, 2024). Turkish banks appear to be quite successful in CDP reporting.

The most successful institutions in CDP reporting are announced in the A list. In 2024, the number of banks based in Turkey included in the CDP A list has increased to 6. The banks included in the A list are as follows: QNB Finansbank, Garanti Bankası, Halkbank, Vakıfbank, and Yapı ve Kredi Bankası (CDP, 2025).

According to current data, the banks in Turkey that have committed to or set targets for the SBTi are as follows: Albaraka Türk Participation Bank, Şekerbank, Türkiye Sınai Kalkınma Bankası, Halkbank, Türkiye İş Bankası, Türkiye Kalkınma Yatırım Bankası, Vakıfbank, and Yapı ve Kredi Bankası. It is currently noted that Garanti Bankası has withdrawn its commitment (SBTi, 2025).

2.5 The Impact of Digitalization on Sustainability in the Banking Sector

In the banking sector, the direct impact of digitalization on a bank's sustainability activities is the reduction of Scope 1 and Scope 2 emissions. By transferring their operational activities to digital environments, banks are reducing their carbon footprint.

Banks are taking significant steps towards a paperless banking system. Examples of paperless banking transactions include digital signatures, online application forms, digital contracts, electronic account statements, and digital slips. Thanks to paperless banking, transactions that used to be carried out by printing paper documents have been digitized, thereby preventing the cutting of trees and the use of paper, while also ensuring that transactions are completed more quickly (Karyağdı, 2022).

In today's banking system, customers can conduct their transactions without the need for physical branches, thanks to digitalization. The absence of physical branches has led to a decrease in the consumption of electricity, natural gas, and water by physical branches. If we examine emissions in more detail, customers do not visit

branches, employees do not visit branches, and therefore, there are no transportation-related emissions (Karyağdı, 2022).

Thanks to digitalization, banks have also increased their energy efficiency by adopting products that reduce their energy consumption. Various energy efficiency measures have been implemented in both the head office buildings and bank branches.

Let us examine the energy efficiency efforts of Türkiye İş Bankası, a major player in the Turkish banking sector. High-efficiency pumps have been installed in the head office building for heating, cooling, and water use. The lighting on the building floors has been replaced with LED lighting, resulting in a 76% reduction in energy costs for each floor. The LED lighting conversion has been implemented in the bank branches, and the old, energy-inefficient air conditioners have been replaced with new, energy-efficient models. Türkiye İş Bankası has installed solar panels on its ATMs, enabling a portion of the energy consumed by the ATMs to be sourced from solar energy. Additionally, through digitalization initiatives, the bank prevented the use of 238 million sheets of paper in 2023, resulting in a 25% reduction in paper consumption compared to the previous year. As a result of these efforts, Scope 1 and Scope 2 emissions in 2023 were reduced by 3,786 tCO2e compared to 2022 (Türkiye İş Bankası, 2024).

The potential impacts of digitalization on sustainability in the banking sector may include issues related to supply chain and sustainable finance accountability. Some banks have made sustainability commitments in their supply chain processes. Thanks to blockchain technology, banks' supply chain processes can be monitored with complete transparency. The various loan products and bonds offered by banks in the context of sustainable finance can be tracked more transparently thanks to blockchain technology. This ensures that customers can be confident that the capital they have deposited with the bank for sustainable finance purposes is not being used for any other purpose (Külahlı & Çağlıyan, 2022).

Banks can benefit from digitalization while actively combating climate risk. Banks are conducting studies, such as heat maps, to determine the extent to which the loans they have granted to sectors are affected by climate risk. In these studies, banks must deal with a large amount of data to calculate the climate risk for all their customers to whom they have granted loans. There is potential for much faster work

by using technologies such as artificial intelligence and machine learning to calculate the impact of climate change on bank portfolios (Rolnick et al., 2019).

Examining the adverse effects of digitalization on sustainability in the banking sector from the perspectives of both customers and bank employees, digitalization can, in itself, give rise to social problems. Due to digitalization, some routine tasks have been automated, and the closure of branches, resulting from a reduced need for bank branches, has negatively affected branch employees in the banking sector. As a result, some employees fear job loss due to digitalization. It has been observed that digitalization threatens not only the banking sector but all sectors (Frey & Osborne, 2017).

The social problems arising from digitalization for customers are that banks offering digital services often exclude customers who do not have internet access or a device, such as a smartphone or computer, to use digital banking channels. For individuals with low digital literacy levels, performing digital banking transactions can be challenging and risky, and their trust in digital banking applications is generally low. For these reasons, digital banking applications also give rise to social issues (Temizel, 2015).

Chapter 3

Methodology

This chapter of the study describes the research technique used to achieve the research objective, how the sampling selection was made, and how the data subject to the research was collected.

3.1 Research Method

The research method employed was qualitative, specifically semi-structured interviews. With the interview technique, online meetings were held with thirteen bank employees, and open-ended questions were asked. The thirteen bank employees interviewed were director, head of the departments, managers and assistant managers at the bank level, and the interviews sought to explain whether digitalization had an impact on sustainability practices in the Turkish banking sector. A total of five questions were asked during the interviews. After carefully reviewing the literature and discussions with the academic experts on the digitalization impact on the sustainability practices and reporting, we decided to forward the following questions to our subjects:

1. Considering your digital banking applications (mobile branches, e-invoicing, paperless banking, branchless banking), how would you assess your bank's level of digital maturity? (Broccardo, Truant, and Dana, 2023).
2. When granting loans in any category (individual, corporate, or commercial), do you have any mandatory requirements or questions related to sustainability? Do these questions affect the granting of loans? If so, how? (Zimmermann, 2019).
3. Which digital technologies do you use in your sustainability practices and, sustainability reporting? If you do not report, do you think digital technologies could be useful for sustainability reporting? (Werth, Schwarzbach, Rodríguez Cardona, et al., 2020)

4. What are the biggest challenges you face in integrating digitalization and sustainability? (Diener & Špaček, 2021).
5. How do you expect digitalization to transform sustainability in the banking sector over the next 5 years? (PwC, 2016).

3.2 Study Group and Sample Selection

Purposive sampling was used in the study to select the sample. The bankers who answered the research questions were selected from among individuals with relevant experience in the fields of sustainability and banking. A total of thirteen individuals participated in the study, eleven of whom work directly in the field of sustainability. Of these eleven, one is director, six are head of the department, two are manager, two are assistant manager. The other two individuals were selected from the bank's finance department, including those involved in project financing and credits. Among these two individuals, two are head of the departments.

The selected working group was chosen with an emphasis on the diversity of banks. The group interviewed includes bank employees who hold managerial positions in both private and public banks.

The group interviewed includes six deposit banks, one participation bank, and two investment banks. The purpose of selecting three different types of banks is to support the study's objective of working with different banks in the Turkish banking sector. Detailed information about the bank managers included in the study is provided in table 2.

To ensure that the responses provided by the bank managers can be shared anonymously, participants banks were assigned the following codes: S1, S2, S3, S4, S5, S6, S7, S8, and S9. Participants were assigned the following codes: D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12 and D13.

Table 2

Participant List Details.

Participant Bank	Participant Nickname	Employee's Title	Employee's Department	Experience in Banking Sector (years)
S1	D1	Assistant Manager	Sustainability	6
S1	D2	Head of Department	Project Finance & Credits	10
S2	D3	Head of Department	Sustainability	33
S2	D4	Manager	Sustainable Finance	5
S3	D5	Head of Department	Sustainable Finance	6
S3	D6	Head of Department	Sustainability	15
S4	D7	Head of Department	Sustainability	15
S4	D8	Head of Department	Project Finance & Credits	15
S5	D9	Assistant Manager	Sustainability	9
S6	D10	Director	Sustainability	23

Table 2 (cont'd)

Participant Bank	Participant Nickname	Employee's Title	Employee's Department	Experience in Banking Sector (years)
S7	D11	Head of Department	Sustainability	6
S8	D12	Manager	Sustainability	12
S9	D13	Head of Department	Sustainable Finance	8

3.3 Data Collection and Analysis

Since the data for the research was collected using semi-structured interviews, the five pre-determined questions provided comparable data from all bank managers. During the interviews, the managers also provided information that was not directly addressed in the questions, allowing for a more in-depth examination of the research topic.

During the data collection process, open-ended questions were asked to bank employees without any misdirection. Due to the busy schedules of the bank employees participating in the research, the interviews were planned as online video conferences and conducted via Microsoft Teams. To ensure the interviews were productive, each lasted approximately 30 minutes, and notes were taken during the sessions. In addition to the notes taken, the data shared after the meetings were recorded for analysis, and the conversations were transcribed after the meetings. Each participant has given their consent for the recording and analysis of the data collected during the interviews.

During the data analysis process, after the notes were transcribed, a thematic analysis method was selected, which focuses on the researcher's interpretive role (Braun & Clarke, 2021).

During this analysis phase, all interview recordings were reviewed multiple times, and noteworthy statements were identified and noted. After the notes were taken, the Google Gemini AI application was used for the thematic analysis of each research question. In the third phase, the codes identified by the relevant Google Gemini AI technology were checked and grouped to create specific themes. In the fourth phase, the themes were compared with existing data, and revisions were made to abstract themes. In the fifth phase, a comprehensive title was determined for the remaining themes. Finally, the analysis results were compiled into an analysis report supported by examples and definitions from bank employees regarding the final themes.

3.4 Limitations of the Study

Within the scope of the research, a total of nine banks and thirteen bank employees from these banks were interviewed; however, it was not possible to interview every bank in the Turkish banking sector. Since not every bank was included in the research, the findings do not represent the views of the entire Turkish banking sector, and the results are limited to the responses of thirteen banking employees. Additionally, the professional experience of the participating bankers varied. This is understandable given that sustainability banking is a relatively new and evolving field in Turkey. Therefore, the findings reflect this diversity in experience.

3.5 Validity and Reliability of The Research

To ensure the validity and reliability of the research, the transcripts resulting from the interviews were sent to the bank employees and submitted for their approval. The outputs obtained during the analysis process were evaluated by an expert, and a second approval was obtained. To ensure the validity and reliability of the research, the findings section also includes direct statements made by participants during the interviews. The researcher is aware of their bias due to their experience in the fields of sustainability and banking, and has based the research findings directly on the data provided by the participants.

3.6 Ethical Issues

This research was conducted according to ethical standards. Each participant in the research was informed prior to the interview about the purpose of the research, the interview questions, how the data obtained would be used, the duration of the interviews, and that the study was based on voluntary participation. Each participant was sent an informed consent form, which was signed and physically stored.

To protect the identity of the banks where the participants work, all bank employees were given pseudonyms. Information that could reveal the identity of the bank was not used in the research. The meeting records, transcripts, and consent forms collected during the research are stored securely and are only accessible to the researcher.

Chapter 4

Findings

In this study, online meetings were held with a total of thirteen bank employees. The banks interviewed included one participation bank, two development and investment banks, and six deposit banks. Four of these banks are state, and five are private. The average number of years of banking experience of the thirteen bank employees is approximately thirteen. The positions of the interviewees within the banks include assistant manager, manager, department head, and director. The distribution of the departments where the bank employees work is as follows: eight people work in the sustainability department, three people work in the sustainable finance department, and two people work in the project finance & credits department.

The purpose of the interviews was to measure the digitalization effect on the sustainability applications and reporting in the Turkish banking sector.

In the first question, the purpose is to understand the maturity level of banks in the Turkish banking sector. According to the answers to the first question, banks in the Turkish banking sector generally consider their digital maturity level to be good and believe it will continue to improve daily. When we evaluate the answers to this question thematically, three themes emerge. These themes are deposit banks: leadership position in the sector, development and investment banks: internal digitalization, and participation banks: challenges in digitalization.

All deposit banks are considered to be at a good point in terms of digitalization, with all deposit banks having very high digitalization rates in customer transactions and investing in technologies such as artificial intelligence-supported robotic processes (RPA) and optical character recognition (OCR) in customer channels.

In development and investment banks, it was stated that the focus is on internal processes in digitalization due to the absence of individual customer services. The banks participating in the study have increased efficiency in their processes with corporate customers, reduced operational difficulties, and digitized their employees' transactions.

Participating banks stated that the digitization of their processes differs because the services they provide are distinct from those of deposit banks. Nevertheless, they

expressed that they attach great importance to digitization and will continue to make progress every day.

It was observed that digitalization is highly valued across the sector and is viewed as a strategic approach. Three of the bankers interviewed mentioned that they have special units dedicated to digitalization. It was observed that regulations complicate digitalization.

In our second question to the participants, we assessed the importance of sustainability in lending within the Turkish banking sector and its impact on loan decisions.

Three themes emerged from the participants' responses to the question: transition process, direct impact, and international funds. Examining the transition process theme, we observe that all nine banks pose social and environmental questions related to sustainability in their credit processes on a particular scale.

Three of the nine banks stated that all commercial and corporate loans are assessed in terms of sustainability, regardless of scale.

As a result of the interviews, two of the participating banks in the study stated that they ask questions related to sustainability in projects exceeding a particular scale. However, these questions do not have a direct impact on their decision-making process. Both banks mentioned that they have future goals to ensure that sustainability has an impact in this regard.

When examining the theme of direct impact, we found that five banks directly influence their lending decisions based on the answers companies provide to sustainability questions.

In terms of international funds, seven banks stated that they were required to comply with sustainability requirements due to the use of international funds they had received. They stated that they imposed sustainability requirements on their customers for loans under these funds and that if the conditions were not met, they could not receive loans.

In general, during the interviews, it was observed that sustainability-related questions are asked when granting loans to corporate and commercial customers. As mentioned above, this has a direct impact on the credit in five banks. However, there are no mandatory sustainability requirements for individual loans, and no questions

are asked in this regard. The standard view is that sustainability requirements will not be mandatory for individual loans in the future.

The third question we asked participants aimed to determine whether they were benefiting from digitalization in sustainability practices and reporting. The answers were categorized into four themes: operational practices, digitalization in reporting, data issues, and artificial intelligence.

When examining the theme of operational applications, all thirteen participants mentioned that they had benefited from digitalization in their banks' sustainability practices. In the examples we encountered, we observed that they benefited from digitalization through the widespread adoption of paperless banking applications, energy-saving projects, emission calculations, monitoring sustainability-related developments, and climate risk assessments.

According to the participants' responses, five banks mentioned that they benefited from digitalization in calculating climate risks related to sustainability. Since a large amount of data is used in calculating climate risks, it has been observed that they benefit from data analytics in this context. When we examined the outputs of the digitalization theme in sustainability reporting, none of the banks mentioned that they used a digital solution directly in the reporting section.

However, six banks mentioned that they benefited from digitalization applications in the process of collecting or analyzing data related to sustainability reporting, and three banks mentioned that they had plans to benefit from digitalization in data collection processes. Two banks among the participants stated that they calculated all emissions directly on digital platforms and did not perform any manual operations.

When examining the issue of data, it was observed that a total of three banks considered data to be the biggest obstacle to digitalization in sustainability reporting. Participants D1, D5, and D6 stated that digitalization in reporting was difficult because insufficient data could not adequately feed technologies such as artificial intelligence.

The participant from participant D8 stated that the quality of data was an issue. It was mentioned that some of the data reported in the sustainability context was open to interpretation, i.e., not numerical, which caused problems in making the process completely digital.

Within the scope of the artificial intelligence theme, participant D7, participant D12, and participant D13 stated that they used artificial intelligence in their sustainability activities. Participants D1, D2, D5, D6, and D7 stated that AI-focused solutions would be helpful in sustainability activities. Participant D13 stated that AI was beneficial in sustainability activities, but that the process could never be left entirely to AI; manual human control was necessary.

The purpose of the fourth question asked of the participants was to understand the most significant challenges they faced while integrating digitalization and sustainability in their banks. When the answers were evaluated through thematic analysis, five themes emerged. These themes include banks' technological infrastructure problems, the financial cost of digitalization, employee resistance & low awareness in a bank, as well as legislation and data privacy concerns.

When examining the theme of technological infrastructure problems, four participants who participated in the study identified infrastructure as one of the most significant issues. They stated that the institution's old, unused systems and the bank's inadequate technological infrastructure caused difficulties in integrating digitalization and sustainability.

In terms of costs, five participants reported difficulties due to the high cost of digitalization activities. In comparison, three participants stated that cost was not an issue for their banks in terms of digitalization.

Six participants reported that it was challenging to persuade bank employees to adopt a new system due to employee resistance and limited awareness.

Five participants, however, reported that there was no resistance from employees, and employees even welcomed digitalization as it made their work easier. Five participants saw low awareness as a problem in integrating digitalization and sustainability. They emphasized the importance of providing training to raise awareness and promote understanding.

When this question was evaluated separately, it was observed that D1 and D2 participants working at the same bank had different opinions regarding the resilience of the institution's employees. While D1 participants stated that employees did not cause any difficulties, D2 participants stated that employees' competence on the subject affected the adaptation process. The primary difference between the

participants is that D1 works in the sustainability department, while D2 works in the project financing and loans department.

According to answers, when examining the issue of legislation theme, it was stated that the lack of clear regulations and legislation on digitalization and sustainability creates a necessity for integration. A total of six participants stated that uncertainty regarding legislation creates problems in integrating digitalization and sustainability.

In the context of data privacy, according to the statements of participants D9 and D10, it was observed that data privacy poses a challenge in the integration of digitalization and sustainability in the banking sector, particularly in the use of customer data.

When examining the challenges encountered in integrating digitalization and sustainability, the most common issues were resistance and low employee awareness, as well as regulatory constraints. Following these two issues, five participants identified the cost of digitalization as the next most challenging aspect.

The fifth question was asked to analyze participants' thoughts on how digitalization will affect sustainability applications and reporting in the banking sector over the next five years. The answers to the fifth question were classified thematically into four themes. These themes are the driving force of regulations, branchless banking, artificial intelligence technology, and the adverse effects of digitalization.

When evaluating the driving force of regulations, five participants stated that legal regulations and regulatory requirements are expected to increase in the coming years, and that banks will therefore place greater emphasis on digitalization and sustainability. They believe that this will contribute to sustainability reporting and practices in the Turkish banking sector.

When examining the theme of branchless banking, we observe that some participants anticipate a decrease in the number of bank branches in the coming years. Three participants believe that transactions made at branches will decrease within five years, and therefore, the need for branches will decrease. As a result of the decreasing need for branches, the number of bank branches is expected to decrease, and customers will increasingly turn to online banking channels. It is believed that the closure of branches will have a positive impact on sustainability and that banks' emissions will

decrease. Participant D8, who works at S4 Bank, believes that the current number of physical branches will decrease by one-third within five years.

When analyzing the topic of artificial intelligence technology, it is observed that bank employees see artificial intelligence as the most important technology that will affect sustainability in digitalization. When participants were asked about their ideas for the future, the only technology mentioned was artificial intelligence. A total of four participants stated that artificial intelligence will be a transformative technology for sustainability in the Turkish banking sector within five years. It is believed that artificial intelligence technology will be used extensively in both sustainability reporting and sustainability practices.

When examining the theme of the adverse effects of digitalization, a total of two participants mentioned the adverse effects of digitalization in the Turkish banking sector within a five-year period. Participant D5 from Bank S3 mentioned that digital technologies used in sustainability reporting and practices would cause emissions due to energy consumption and increase electronic waste. While mentioning this negative aspect, the participant stated that the positive effects of digitalization would outweigh the adverse effects.

Participant D9 stated that the closure of branches would negatively affect people working in the bank. While mentioning this adverse effect, he also mentioned that digitalization would create different job categories in banking. The participant stated that the job losses resulting from branch closures would be offset by new job opportunities in the banking sector. Overall, all participants believe that digitalization will positively transform sustainability reporting and practices in the Turkish banking sector within five years.

When the responses given by participants were evaluated based on their job titles within the company, a total of four different job titles were identified. These titles are: in order, director, head of department, manager, and assistant manager. When the responses provided according to job titles are examined, it is observed that the response styles of participants with job titles other than director are similar. In contrast, the participant with the title of director, who is D10, provided shorter, more concise, and customer-market-focused responses compared to participants with other job titles.

Chapter 5

Discussions and Conclusions

This study explains the impact of digitalization on sustainability practices and reporting in the Turkish banking sector. Within the scope of the study, thirteen bank officials and a total of nine different banks operating in the Turkish banking sector were interviewed.

As a result of the interviews, it was observed that digitalization is a significant factor in the Turkish banking sector, and every bank attaches great importance to it. The study observed that banks have a high level of digital maturity and are continually improving. In particular, it was observed that deposit banks participating in the interviews were more digitally mature than other types of banks, regardless of whether they were public or private banks. The reason for the deposit banks' lead is that they offer digital banking applications directly to customers. The fact that deposit banks are leading the sector in digital banking transactions offered to their customers supports the trend of digitizing physical activities and prioritizing customer experience, as revealed in the study by (Haksever and Baykal, 2023).

Development and investment banks, on the other hand, have prioritized digitalization in their internal processes since they do not have individual customers. Participation banks have faced some challenges in digitalization due to the nature of their activities, which differ from those of deposit banks.

The study's findings suggest that digitalization is not a choice; every bank in the Turkish banking sector needs to adopt digitalization. The importance of digitalization that emerged from the interviews is consistent with the literature review, which highlights that digitalization benefits companies' internal processes and is important for customer acquisition (Shanti, Avianto, & Wibowo, 2022).

The research findings reveal that sustainability integration into lending processes is widespread in the Turkish banking sector. Every bank asks questions related to sustainability in the lending process, but sustainability criteria do not have a direct impact on lending in every bank. The banks participating in the interviews mentioned that sustainability criteria are mandatory in the use of international funds.

This requirement, when using international funds, aligns with discussions in the literature on how global commitments, such as the Paris Agreement, impact banking (Atabey & Toprak, 2024). One of the key findings of the study is that the sustainability criteria of five banks have a direct impact on their lending processes.

In the literature review, in 2022 only two banks stated that sustainability criteria had a direct impact on their lending processes, as reported in the TBB's 2024 study (TBB, 2024). It is thought that this number could be higher if the study had been conducted with all banks in Turkey. Compared to previous years, sustainability criteria are no longer in the background of the lending process but have begun to influence credit operations directly.

Examining the findings on the impact of digitalization on sustainability practices and reporting, it has been observed that the impact of digitalization is progressing at varying speeds in terms of implementation and reporting.

Digitalization is widely used in sustainability practices. In the interviews, all bank managers stated that they benefit from digitalization in their operations. Participants mentioned that they use digital technologies in paperless banking, energy saving, and emission calculations, which supports the studies in the literature that digitalization reduces paper usage (Karyağdı, 2022) and confirms studies in the literature that digitalization reduces Scope 1 and Scope 2 emissions by saving energy (Türkiye İş Bankası, 2024).

The study's findings reveal that banks in Turkey utilize data analytics technology to assess climate risks. The use of data analytics in climate risk calculation underscores the importance of digital technologies in handling complex data, as noted in the previous studies (Rolnick et al., 2019).

The findings reveal that digitalization has a significant contribution to sustainability practices, but does not have a significant impact on sustainability reporting at this stage. The findings reveal that there is currently insufficient data to determine the impact of digitalization on sustainability reporting, and that some sustainability data is open to interpretation.

The most common challenges identified in integrating digitalization and sustainability are employee resistance and low awareness, as well as regulatory uncertainty. The lack of awareness among bank employees about the importance of sustainability rather than digital transformation has added a new dimension to the

social effects of digitalization in the literature (Frey & Osborne, 2017). The problem is not so much that bank branch employees fear losing their jobs, but rather that they do not understand the benefits of sustainability, such as environmental benefits and the importance of new job opportunities.

While the financial costs of integrating digitalization and sustainability are a concern in some banks, they are not viewed as such in others. The scale of banks, their position in the sector, and their investment priorities are related to the financial costs being a problem in some banks. Data privacy, one of the problems banks have experienced in this integration, is a critical legal issue that hinders the development of big data analytics (Abraham et al., 2019).

5.1 Conclusion

This thesis aims to investigate how digitalization in the banking sector in Turkey impacts sustainability practices and reporting, employing a qualitative research method. According to findings from interviews with thirteen executives from a total of nine banks in the Turkish banking sector, digitalization has a direct impact on sustainability practices. Although its current impact on sustainability reporting is limited, it is expected to have a greater impact in the coming years.

In conclusion, digitalization plays a strong role in sustainability in the Turkish banking sector. The impact of digitalization is evident in the analysis processes of issues such as increasing operational efficiency, reducing paper and energy consumption, integrating sustainability risks into lending processes in a more systematic manner, and assessing climate risk. The speed and depth of the impact of digital transformation on sustainability in banks depend on the type of bank, internal awareness, existing technological infrastructure, and regulatory factors.

This study contributes to the literature by examining qualitative data obtained from interviews on digitalization and sustainability in the Turkish banking sector. The biggest obstacle to the impact of digitalization on sustainability in the Turkish banking sector is the transformation of corporate culture and the standardization of legislation, which emphasizes both human and system dimensions in this regard.

5.2 Recommendations for Banks and Regulators

For banks: During the interviews, participants D5, D7, D9, D12, and D13 emphasized the importance of internal training at banks for digitalization and sustainability. While continuing their digitalization activities, banks should increase the knowledge and awareness of their employees by providing training in this area within the organization so that digitalization can contribute more to sustainability implementation and reporting.

For Regulators: During the interviews, participants D1, D5, D8, D12, and D13 stated that the implementation of global regulations and standards related to sustainability and digitalization would increase the impact of digitalization on sustainability. Standard and enforceable regulations should be established regarding sustainability practices and reporting that all banks worldwide must comply with. Standardization will create a level playing field, encouraging banks to increase their investments in digitalization, which will have a more positive impact on sustainability.

5.3 Recommendations for Future Research

In this study, the statements of Turkish banking sector employees were analyzed using the interview method. Future research could focus on the following topics:

- A study could be conducted on the social effects of the widespread adoption of branchless banking, as predicted by the participants, on financial inclusion and employment.
- The same study could be conducted by selecting a country in the European region and comparing the state of digitalization and sustainability in the banking sector there with that in Turkey.
- A study could be conducted on which technologies should be used to fully benefit from digitalization in sustainability reporting and what needs to be done in this regard.
- A study could be conducted on how sustainability has affected banking products, and which types of banks offer more advanced sustainable banking products?

The prediction that artificial intelligence will be used more extensively in the next five years, with physical branches closing and being replaced by digital banking, indicates that the Turkish banking sector is on the verge of a transformation process. In the coming years, digitalization is expected to contribute significantly to the application and reporting of sustainability in banking, and the importance of this issue will be better understood.

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