Journal of Infrastructure, Policy and Development 2024, 8(9), 7623.
https://doi.org/10.24294/jipd.v8i9.7623

Review

The neobanks and sustainability

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CITATION

Amon A, Jagrič T, Oplotnik ZJ. (2024). The neobanks and sustainability. Journal of Infrastructure, Policy and Development. 8(9): 7623. https://doi.org/10.24294/jipd.v8i9.7623

ARTICLE INFO

Received: 29 June 2024
Accepted: 26 July 2024
Available online: 6 September 2024

Abstract: The rise of fintech in the financial sector presents a transformative shift towards digitalisation and sustainability on a global scale, leveraging technologies like AI to minimise environmental footprint. Neobanks not only challenge traditional banking models but also offer innovative solutions that align with sustainable objectives. The purpose of this paper is to analyse the impact of neobanks on global sustainability from economic, environmental, and social points of view. A comprehensive literature review of existing literature and current sustainable practices of neobanks was conducted. Results reveal that neobanks significantly positively contribute towards environmental sustainability with reduced paper use and logistics requirements of banking services. By offering more accessible and affordable banking services they importantly contribute towards higher financial inclusion, and with innovative products towards more competitive and innovative financial markets. AI-based tools they employ are increasing financial literacy and social inclusion. This article also highlights concerns regarding electronic waste management, potential high energy consumption, required digital literacy and cybersecurity risks. In conclusion, despite the mentioned risks, neobanks importantly contribute to global sustainability in many ways and will even more in the future. These findings can help neobanks shape sustainable practices and guide policymaking, as well as spread awareness of the sustainable impact of banking services.

Keywords: fintech; banks; neobanks; sustainability; environmental; impact; financial; inclusion

1. Introduction

The financial sector is undergoing a profound transformation enabled by advancements in financial technology, shortly fintech. Many have noted that fintech, along with other Industry 4.0 technologies, must be leveraged to enhance environmental sustainability through de-materializing consumption and production, thus ensuring lower use of natural resources (Abdul-Rahim et al., 2022; Moro-Visconti et al., 2020; Oláh et al., 2020).

The rapid technological transformation and digitalisation of financial services resulted in new entrants, fintech banks or neobanks (Nagy et al., 2024). Neobank is defined as a "direct bank, which is 100% digital and serves customers through mobile applications and personal computers" (Gorodianska et al., 2019). **Table 1** summarises the key characteristics of their business model in comparison to the traditional banking business model.

Table 1 shows several distinctions between the two business models, the main being the lack of physical branches and 24/7 access to neobanks. As such, neobanks have emerged as pivotal players in this digital evolution, presenting an alternative to traditional banking models with their innovative business model. These digital, technology-driven financial institutions operate exclusively online, challenging

traditional banking models and offering innovative solutions to consumers (Amon et al., 2023). Neobanks have further developed during the global COVID-19 pandemic, which changes customers' behaviour in spending and purchasing, as well as their choices of payment and transfer methods (Abdul-Rahim et al., 2022; Laato et al., 2020; Prentice et al., 2020).

Table 1. Comparison of neobanking and traditional banking business model.

Characteristics	Neobanks	Traditional banks
Operating channels	Exclusively through digital platforms, used through smartphones, smartwatches, and computers.	Mostly physical branches, and fewer digital banking platforms.
Communication channels	Mostly through notifications and AI-based chatbots as help centres on digital platforms, via emails and less often through phone	Mostly through physical contact in the bank's branch or via phone, less often through email or digital banking platform notifications.
Cost structure	Smaller operational costs due to lack of physical branches and ATMs.	Larger operational costs due to maintaining a network of ATMs and physical branches.
Products and services	New and innovative insurance and investment products like travel, sports, smart devices insurance, crypto trading, investments in eco-friendly enterprises etc.	Traditional banking products and services with traditional insurance and investment products take a smaller share of the conducted business.
Strategic focus	Often on specific customers, particularly in small niches or customer segments. A lot of neobanks specialize for only minors, SMEs, particular race, ethnicity, gender, or religion.	Less specific, focusing generally on households and enterprises.
Operating hours	Unlimited, services are available 24/7.	Limited to business hours.
Speed of payments and transfers	Very fast, in a matter of minutes, regardless of one's location or time of day.	Slower, limited to working hours of payment processing.
Requirements for use	Digital literacy, smart devices and access to the internet.	Access to a physical bank branch or smart device and the internet for the bank's digital platform.

Source: (Amon et al., 2023; Amon and Jagrič, 2022; Gorodianska et al., 2019; Temelkov, 2020a, 2020b).

As neobanks gain prominence, it becomes imperative to assess their impact on global sustainability, considering the elaborate interplay between environmental, economic, and social dimensions. In this paper, the study of neobanks extends beyond their disruptive effect on traditional banking institutions; their complex role in shaping sustainability across environmental, economic, and social dimensions is examined.

Due to the increasing risks of climate change, the framework called the Sustainable Development Goals was developed. Its purpose is to improve the lives of the world population by managing climate change and other man-made risks (United Nations, 2024). Many challenges arose in determining the requirements of reporting progress towards sustainability. An important consideration is the double-materiality concept. This concept and related reporting are defined in the European Sustainability Reporting Standard (ESRS), aimed at all large and listed enterprises for disclosure of information on risks and opportunities arising from environmental and social threats (EC, 2023). The double materiality in the sustainability context offers criteria for determining if a particular aspect of sustainability should be disclosed in a sustainability report or not. It presents the union of impact materiality and financial materiality. An aspect of sustainability fulfils the criteria for double materiality if it is material from the financial or from the impact perspective, or from both. Impact

materiality includes effects directly or indirectly caused by reporting entities like GHG emissions and using products ensured by child labour, while financial materiality includes financial impact on reporting entities like generating risks or opportunities that may affect the ability to gain resources or have other effects on future cash flows (EFRAG, 2022). Its aim is to reduce greenwashing in sustainability reporting by increasing transparency (Förster, 2023).

Neobanks, operating within a digital framework, inherently depart from the physical nature of brick-and-mortar branches of traditional banks, as shown in **Table 1**. This shift not only aligns with global environmental objectives but also prompts an exploration of the broader sustainability implications associated with their operational model. By leveraging digital platforms, neobanks minimize their environmental footprint, paving the way for a more sustainable financial ecosystem.

Technological innovation stands as a crucial feature of neobanks (Jagrič and Amon, 2023; Temelkov, 2020b), with artificial intelligence, machine learning, and blockchain playing integral roles in their operational frameworks. Beyond the immediate improvements in efficiency and risk management, these technologies offer a unique opportunity to address sustainability challenges within the financial sector.

Furthermore, neobanks exhibit a potential to redefine financial inclusivity. Through user-centric interfaces, streamlined processes, and reduced transaction costs, neobanks can extend financial services to historically underserved populations that are unbanked or underbanked (Bradford, 2020; Monis and Pai, 2023b; Sardar and Anjaria, 2023). They can achieve this primarily due to their digital accessibility, making them advantageous for individuals living without nearby bank branches and in more remote areas. However, they do require a smart device and an internet connection to conduct banking services, which is a privilege not available to everyone. Nevertheless, they can still significantly help lower-income individuals who have this privilege, especially those who lack the logistical resources to visit physical bank branches. They would benefit greatly from the digital accessibility of neobanks, as well as their favourable prices of banking services, compared to a traditional bank. The basic account with most neobanks is completely free of charge (Monzo, 2024b; N26, 2024; Revolut, 2024).

The absence of physical infrastructure constraints allows neobanks to transcend geographical barriers, thereby contributing to sustainability goals on a global scale. This study aims to dissect the nuanced relationship between neobanks and financial inclusion within the broader context of sustainable development.

Thus, the purpose of this paper is to provide a comprehensive analysis of neobanks' contributions towards global sustainability. Through an extensive literature review, the multifaceted landscape of neobanks is studied, and their influence on sustainable development is analysed on a global scale. The objective of this study is to fill a research gap on the effects of neobanks on sustainability with a comprehensive analysis from economic, environmental, and social aspects. This article's findings will contribute to a better understanding of the sustainable impact of neobanks, their technological contributions and social implications. They will help neobanks shape their future sustainable practices to maximize their positive contribution and mitigate potential negative contributions.

This paper is structured as follows. The first chapter presents an introduction to the main research problem: the effects of neobanks on sustainability. The second chapter describes the methodology. The third chapter presents the findings. The fourth chapter concludes this research with a discussion.

2. Materials and methods

To conduct this research, a systematic approach was adopted. A literature review methodology approach was applied to examine the impact of neobanks on global sustainability. The methodological process focused on collecting data from academic databases, industry reports, and reputable financial publications from January to March 2024.

First, the research strategy was defined by choosing a diverse range of keywords to ensure the inclusion of relevant resources. The following keywords were used: "neobanks", "fintech banks", "challenger banks", "digital finance", "sustainability", "environmental impact", "social inclusivity", "social responsibility", "green initiatives", "green neobanks", "green banking practices" and other related terms. These keywords were selected based on their relevance and potential to cover various dimensions of sustainability, aiming to gather as complete set of data as possible. Keywords were used primarily individually in search, followed by various combinations of them like "neobanks sustainability" and "green initiatives fintech" to enhance search results. These keywords were selected strategically, based on their relevance to the research topic and set wide, to cover various aspects of sustainability.

Next, the research was conducted in the following databases: Google Scholar, Science Direct, Taylor and Francis Online, IEEE Xplore, Scopus, and Web of Science. This wide selection of databases was aimed at including a broad spectrum of relevant scientific articles and studies, ensuring the incorporation of contemporary perspectives. Articles without DOIs were excluded to maintain the credibility and traceability of references.

Neobanks represent a significant innovation within the financial sector, thus they are relatively new phenomena. Consequently, there is a significant research gap in many aspects of them, including their effects on sustainability. Priority was given to high-quality scientific articles; however, other types of references were also considered where scientific literature was insufficient. Therefore, we also explored other types of references like professional articles, statistical databases, and industry reports from neobanks and other relevant parties. Such a research strategy was structured to provide a nuanced understanding of the impact of neobanks on global sustainability.

After data was systematically gathered from listed academic databases, industry reports and other resources, it was meticulously studied. After comprehensive observation, it was analysed and the findings were synthesized to draw conclusions, identify patterns, and highlight differing perspectives within it. The selection criteria for inclusion were based on the relevance to selected keywords and the publication date to ensure up-to-date information and include latest research. After that, based on the comprehensive analysis, the synthesis of the findings was structured in three main pillars of sustainability: environmental, economic, and social. This structure enabled

a thorough examination and exploration of neobanks' effects on sustainability across these three crucial aspects. The three pillars together provide a full review of neobanks' contributions towards sustainability.

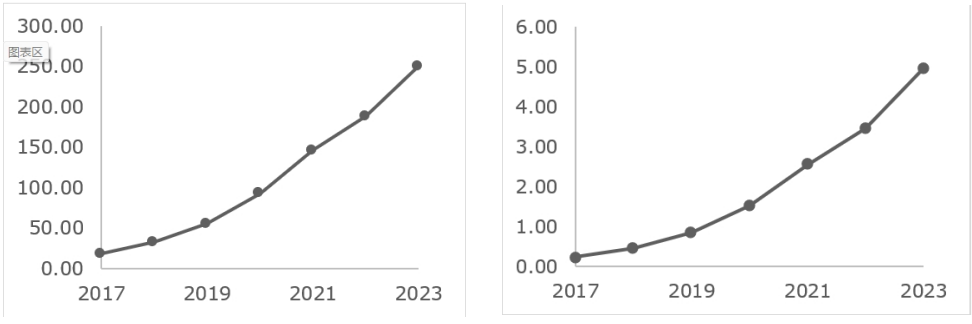
After that, we highlight possible future implications of neobanks for global sustainability. These findings not only contribute towards a greater understanding of neobanks' role in the global economy and society but also present a framework for future research in the field of sustainable finance.

Lastly, we consider the limitations of this study. In the process of literature selection, potential biases could arise from the exclusion of articles without DOIs, potentially excluding relevant but unpublished or non-peer-reviewed studies. While our aim is as comprehensive a scope of the article as possible, provided by including many various references, search limitations like keyword selection and time limitations may still result in some exclusion of relevant literature. Additionally, we must consider the possible significance of less-documented effects and emerging trends, which may not be covered by existing literature.

3. Results and discussion

The last decade has witnessed a transformative shift in the banking sector, marked by the rise of neobanks. Neobanks are digital-only financial institutions that distinguish themselves from traditional banks by operating without physical branches. Instead, they only use technologically advanced digital platforms and mobile applications (Amon and Jagrič, 2023; Bradford, 2020; Jagrič et al., 2021; Temelkov, 2020b).

Their bloom in the past decade has been enabled by rapid technology advancements like fintech, increased internet accessibility and a growing demand for convenient, efficient, digitally executed financial services. Such demand has increased significantly during the global pandemic of COVID-19 (Jagrič and Amon, 2023).



(**a**) (**b**)

Figure 1. (**a**) Number of neobanking users (in million users, 2017–2023, worldwide); (**b**) transaction value of neobanking market (in trillion USD, 2017–2023, worldwide).
Source: (Statista, 2024).

Figure 1 shows the number of neobanking users (in million users) and transaction value of the neobanking market (in trillion USD) on a global level from 2017 to 2023. It shows that both continuously increased every year, indicating the growing significance of the neobanking market. The transaction value of the neobanking

market reached a little below 5 trillion USD at the end of 2023, while at the end of 2017, it was only 0.23 trillion USD. The number of users globally also grew from approximately 19 million in 2017 to more than 250 million in 2023. This indicates that neobanks are becoming significant players in the financial markets, thus their role in achieving global sustainability must also be considered. Financial institutions like banks and neobanks have a major impact on sustainable development with many direct effects like office buildings for their branches, paper use, waste management and energy consumption. They also impact sustainability via indirect effects like the criteria for financing projects, social inclusion and the development of new products and services (Jeucken, 2010; Varga, 2018).

The United Nations Brundtland Commission has defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". The framework to do that is the Sustainable Development Goals (United Nations, 2024). With the increasing popularity of neobanks, considering the way they conduct business (without requiring visits to physical branches and paperwork), the question arises as to whether they also contribute towards sustainability in the economy or not.

Several studies have shown the positive effects of fintech on sustainability, also suggesting the possibility of effects of neobanks, institutions fully based on fintech, on global sustainability. For instance, a study of the Sustainable Development Goals (SDGs) and open innovation from FinTech enterprises has found that lending, financial infrastructure and personal finance exhibit discourse correlated to innovation and, on a smaller scale, correlated with SDGs (Franco-Riquelme and Rubalcaba, 2021). Industry 4.0 technologies like fintech are defined as "indisputable change agents for sustainability" (Abdul-Rahim et al., 2022). Through surveying bank customers in Malaysia, this research has proved that fintech significantly and positively influences sustainability. Fintech was found to be a driver of financial inclusion and have a significant contribution towards sustainability in Malaysia. Another study examined the usage of digital financial services and its social effect in the Ugandan market (Museba et al., 2021). Through analysis of survey responses from 400 users of digital financial services, the authors have found the adoption of these services to be significantly impacted by the need for access to financial products and services from the unbanked population. These services have been found to positively impact sustainable development goals of gender equality (SDG5), decent work and economic growth (SDG8) and reducing inequalities (SDG10) through increasing financial inclusion. Similarly, the effect of digital financial services, originating from fintech, on achieving the SDGs was analysed through field data from rural area in Zambia (Chikalipah, 2020). It was found that savings via these services helps households with low income to smoother their consumption, lower vulnerability to shocks through risk diversification and invest by saving, which can significantly contribute towards achieving the SDGs.

It also investigated how fintech supports sustainable development (Varga, 2018) and found that fintechs provide services to previously underbanked and unbanked parts of the population, indicating its contribution towards higher financial inclusion. In the previously mentioned study it was also found that fintech contributes towards financial inclusion through serving unbanked and underbanked consumers, such as

low-income households and minority groups (Abdul-Rahim et al., 2022). It enables accessible, affordable and convenient financing, which then helps increase economic opportunities for these parts of the population (Abdul-Rahim et al., 2022; Senyo and Osabutey, 2020; UNSGSA, 2018).

Fintech services have also been found to lower overall costs, increase the quality of financial services, increase employment rates and lower the poverty rate through lower transaction costs and providing financial access through microfinance and crowdfunding (Abdul-Rahim et al., 2022; Moro-Visconti et al., 2020; Ziemba, 2019). Technology within financial services can also significantly contribute to improving consumers' digital literacy and skills. Additionally, FinTech services have the potential to lower energy consumption, such as fuel usage, and bolster environmental protection by reducing carbon emissions (Abdul-Rahim et al., 2022; Deng et al., 2019; Dubey et al., 2019; Ziemba, 2019). Another research also found that fintech may play a significant role in transitioning towards sustainable finance through its microfinance and crowdfunding options (Moro-Visconti et al., 2020). Thus, fintech has been established to be a significant tool in helping the global economy achieve sustainability. Because of that, the role of neobanks as a sustainability tool is an important topic for further research.

In general, it was proven that customer identity verification mechanisms, IT systems, security controls, business continuity plans in exceptional circumstances and liquidity management mechanisms contribute towards the sustainability of neobanks (Almasri and Sunoco, 2023). Similarly, another study examined factors that affect the sustainability of neobanks and their development (Temelkov, 2022). Through literature review, it was found that the economic, regulatory, and technological environment, along with dynamic customer demand, determine the sustainability of neobanks.

In a study of green initiatives from banks on a global level (Rakshitha and Chaya, 2023), the term “Green Banking” was determined for banks globally investing in green strategies as a part of a wider plan for sustainable development. They note the green finance movement to be relatively recent but growing fast and warn that higher demand for green financial products can be expected. Furthermore, they study five examples of banks, often called green (neo)banks, that have implemented green initiatives to a significant extent. All of these examples are neobanks; Starling, Treecard, Aspiration, bunq and Tomorrow. This already indicates the significant progress neobanks have made in actively contributing towards greener development, compared to traditional banks. For a long time, green banking has been widely encouraged amongst banks in order to stimulate sustainability through environmentally friendly projects and investments (Monis and Pai, 2023a; Sahoo and Nayak, 2007).

Furthermore, we have conducted several case studies of neobanks that already implement successful sustainable practices: Sterling, Treecard, Aspiration, Bunq, Tomorrow, Monzo, Helios and Green Got. **Table 2** summarises the findings, highlighting key sustainable practices implemented in each neobank.

Table 2. Examples of sustainable neobanks' practices.

Neobank	Sustainable practices
Sterling	● cards from recycled plastic and other recyclable materials, ● eco-friendly offices powered by renewable energy, ● having sustainable goals like allocating more to sustainable projects, reducing paper usage and achieving net-zero carbon emissions, ● offering customers a service to switch to a renewable energy supplier, ● responsible lending policy.
Treecard	● contributing 80% of its profits to the reforestation initiative, ● wooden debit cards, crafted in a way that does not damage the environment.
Aspiration	● socially conscious and sustainable cash management services, ● insuring deposits will not fund climate change, ● "Plant Your Change" feature rounds up purchases to the nearest whole dollar, which is then donated to a large tree-planting fund.
Bunq	● Plants a tree for every 100 EUR spent, ● publishing a climate action report.
Tomorrow	● One square meter of rainforest is preserved for every euro spent using their card. This has so far saved 61,617,460 trees, ● carbon footprint feature at no additional cost ● option to round up every payment to the full euro, which is then donated to climate justice, ● every time a customer orders a card a tree is planted in Guatemala, ● usage of wooden cards.
Monzo	● ethical investing of customers' deposits (e.g. not investing in fossil fuel-based energy companies, or arms and tobacco companies) ● no artificial tax planning, ● zero tolerance approach towards modern slavery and human trafficking ● relatively low carbon footprint ● environmental goals like net zero emissions by 2030 in their entire value chain.
Helios	● the main aim is to reduce global warming; new sustainable banking solutions, ● allowing only environmental investments; not a single euro funds polluting industries like oil or coal ● only financing environment-friendly investment projects ● complete transparency regarding financing destinations ● offers free carbon footprint calculator
Green Got	● carbon dioxide equivalent (CO_2e) of customers' card purchases so they can see their personal impact on the environment, ● alternative and completely transparent eco-friendly bank accounts that, with every transaction contribute to funding ocean cleanup, reforestation, or the advancement of renewable energy, ● card made of natural wood or recycled plastic.

Source: (Allen, 2023; Dillet, 2023; Helios, 2024; Monzo, 2024a, 2024b; Paul, 2022; Rakshitha and Chaya, 2023).

Table 3 shows that various neobanks already conduct many measures aimed at increasing global sustainability. Most commonly, those include sustainable investment, heightened transparency, prioritizing sustainable goals, and increasing awareness of one's environmental footprint. Additionally, some of them offer innovative additional measures that can help attract more consumers towards the green initiative, like planting a tree every time a certain amount is spent, using a carbon footprint calculator and using wooden or recycled plastic credit and debit cards.

Despite various positive findings regarding their advantages and contributions towards global sustainability, neobanks are not without challenges and possible disadvantages.

For instance, a study examined the ethical aspect of fintech adoption and potential negative implications (Prastyanti et al., 2023). The authors warn on issues like

customer privacy and data breaches while highlighting the importance of establishing digital ethics in fintech and, thus, neobanks.

Neobanks, as well as other fintech entities, are possibly associated with a high degree of cyber-related risks, potential loss of privacy, compromised data security, heightened financial losses from frauds and scams, uncertain legal status, absence of regulations, and concerns about operational effectiveness among fintech providers. These risks predominantly arise from the misuse and exploitation of data, which has become increasingly accessible in the digital domain (Abdul-Rahim et al., 2022; Amon and Jagrič, 2022; Stewart and Jürjens, 2018).

The question also arises regarding their operational costs, especially energy consumption. Neobanks are banks that operate exclusively digitally and thus, require strong and complex technological infrastructure. It can be assumed that their operational costs are lower compared to traditional banks, which must also maintain a network of physical branches and ATMs, but are they low enough to be considered a positive improvement from a sustainable point of view? Further research is needed to better understand the impact of their operational costs. The rapid technological evolution and digital nature of neobanks have also raised concerns about electronic waste generation. The disposal and recycling of outdated devices and servers are areas where sustainability practices need ongoing attention.

Moreover, neobanks could inadvertently contribute to social exclusion with their digital literacy requirements. Due to the exclusively online nature of their operations, individuals lacking digital literacy or access to sufficient internet connection could struggle with using it. This could disproportionately affect older population, lower-income populations and those in rural or underdeveloped areas, intensifying existing inequalities.

Table 3. Sustainability contribution of neobanks, by type of sustainability.

Type of sustainability	Positive contributions	Negative contributions
Environmental sustainability	● Less paper use, ● reducing the need for physical infrastructure, ● reducing transport and logistics compared to traditional banks, ● cloud-based infrastructure and energy-efficient data centres contribute towards energy efficiency, ● use of renewable energy in some neobanks, ● innovative green initiatives of some neobanks (see **Table 1**).	● Electronic waste concerns ● Carbon footprint: despite operating digital-only, they can significantly contribute through the energy consumption of their data centres and servers.
Economic sustainability	● Increasing the financial inclusion (by offering more affordable and accessible financial services), ● innovative financial products contribute to a more diverse and inclusive financial ecosystem, ● increasing competition in the financial markets, consequently forcing traditional banks to innovate, which could lead to a more resilient and adaptable financial sector.	● In time, potential job losses from the closure of traditional banks, should a number of neobanking users continue to increase significantly.
Social sustainability	● Increasing social inclusion by addressing issues of financial exclusion through including marginalized groups that are unbanked and underbanked, ● increasing financial literacy and spreading knowledge through AI-based financial education tools and support for social impact organizations, ● working on social responsibility through ethical investments, green initiatives, and social inclusion.	● In time, possible financial exclusion of those who lack access to digital devices and the internet, or lack digital literacy, ● Potential social and economic harm of customers from the realization of cybersecurity risk.

Based on the findings of this literature review and previous research conducted by authors on this topic (Amon and Jagrič, 2023; Amon and Oplotnik, 2024; Amon et al., 2023; Amon and Jagrič, 2022; Jagrič and Amon, 2023; Jagrič et al., 2021), in **Table 2**, we further divide the contributions of neobanks towards sustainability into three main pillars: contributions towards environmental sustainability, economic sustainability, and social sustainability.

Neobanks, like any other financial institution or business, can have both positive and negative impacts on environmental, economic, and social sustainability. Neobanks leverage cutting-edge technologies such as artificial intelligence (AI), machine learning, and blockchain to enhance operational efficiency. This results in more accessible and favourable financial services, which in many ways positively contribute towards environmental, economic, and social sustainability on a global scale.

Digital financial transformations, particularly blockchain technology and cryptocurrency, are crucial elements in promoting sustainable practices among neobanks. Blockchain, the most well-known distributed ledger technology, provides the foundational framework for cryptocurrencies. Financial institutions are leveraging these technologies to enhance data security, decentralize transactions, and increase operational safety (Amon and Jagrič, 2023; ECB, 2022; Garg et al., 2021). Blockchain holds significant potential to offer more affordable financial services, boost financial inclusion, and improve the distribution of economic wealth (Amon and Jagrič, 2023; Schinckus, 2020). Cryptocurrencies can encourage green investments among banking customers, as neobanks increasingly facilitate investments in cryptocurrencies. There is a growing trend of green cryptocurrencies, such as SolarCoin and Chia, which are designed to be more energy-efficient and support environmental causes. Consequently, blockchain and cryptocurrencies can substantially strengthen the relationship between neobanks and sustainability, leading to more sustainable and efficient banking practices.

However, blockchain and cryptocurrencies are not without risks. One significant challenge is the environmental impact of blockchain mining, exacerbated by the increasing concentration in the mining industry due to rising profits and computational power demands. To address this issue, solutions such as the Proof-of-Stake algorithm, which requires significantly less computational power, are being developed and show promise in mitigating the energy risks associated with blockchain (Schinckus, 2020). We think blockchain has the potential to play an even more significant role in the sustainable practices of banking institutions by enhancing transparency and providing efficient tools like smart contracts. This potential can be realized if the associated energy risks are effectively managed.

Operating in a digital atmosphere unbound by physical constraints like logistics, neobanks have the capability to reach global markets and provide financial services to remote areas. This global reach opens new economic opportunities for individuals and businesses, fostering economic sustainability on an international scale.

In the rapidly evolving and dynamic context of neobanks, it is also important to consider sufficient education on sustainability. In recent years, environmental issues have become a wide-talked topic, included in school courses and debates in academic and professional circles. Maintaining awareness and educating stakeholders is crucial, as only through education can consumers understand the impact of their decisions and

business entities comprehend the consequences of their practices. Moreover, professional development is important in all industries as all business operations have an impact on sustainability. An important measure in achieving this is CSR (Corporate Social Responsibility). CSR is defined as a "corporate management approach that applies sustainability values in business to promote social welfare within a company and outside it, employs ethical business concepts, supports effective company's resource management and preservation of nature" (Ortiz-Martínez et al., 2023). For neobanks, implementing CSR policies can drive innovation and responsibility, enabling employees to make informed decisions and inspiring the creation of eco-friendly banking products and services. This amplifies the positive impact of neobanks on global sustainability and sets a precedent for the broader financial industry.

Even though, so far, significantly fewer negative contributions have been found than positive ones, those must also be considered a priority. Data privacy and cybercrime risks have already been realised in some neobanks like N26 (Amon and Jagrič, 2022). Appropriate regulation and dynamic supervision are essential for sufficient mitigation of these risks and other possible negative effects of neobanks on global sustainability.

4. Discussion

The objective of this study was to synthesise the existing knowledge of the impact of neobanks on global sustainability, specifically in environmental, economic, and social dimensions. The neobanking market is rapidly growing, and its impact on global sustainability requires further research.

Through a comprehensive literature review, this study aimed to provide an in-depth understanding of the environmental, economic, and social implications of neobanks for global stability. These findings help to inform future research directions, guide policymaking, and contribute to the ongoing transition a more sustainable, inclusive global financial ecosystem and sustainable finance in the digital age.

Many current and positive contributions of neobanks towards sustainability were found. A notable impact of neobanks on environmental sustainability is their reduction of paper use and the logistics impact of banking services. In terms of economic sustainability, they contribute significantly towards higher financial inclusion, as well as towards more innovative and competitive financial markets. From the social sustainability point of view, they importantly contribute to higher social inclusion of marginalized groups and enhancement of financial literacy. However, we also note of new and increasing risks they bear, such as cybercrime and data privacy, as well as potential high electronic waste and energy consumption.

Based on these findings, we can conclude that neobanks pose an important tool for achieving sustainability in the global financial system. In the future, they could contribute even more. While some neobanks already use renewable energy sources, future advancements in this area could solve the potential dilemma of neobanks' energy consumption and help develop more sustainable data storage solutions for all neobanks, should this be needed.

Concerning economic sustainability, results indicate that neobanks will continue to contribute towards higher financial inclusion with their accessibility and

affordability. Also, towards more innovative and competitive financial markets with innovative banking products and services. Additionally, the implementation of responsible lending practices could be even wider spread amongst neobanks.

As to social sustainability, results suggest that they will continue with existing practices: improving financial literacy and social inclusion. We think they will expand their community engagement, particularly engagement with user communities, as it appears to be a successful business strategy so far.

In summary, the connection between neobanks and sustainability is multifaceted and ever-changing. Neobanks have indeed made notable progress towards environmental, economic, and social sustainability, yet they continue to face ongoing challenges and opportunities. It is crucial that regulatory frameworks like financial regulation, consumer protection laws, compliance and reporting requirements adapt to the evolving nature of neobanks, ensuring fairness and inclusivity as fundamental principles. Further research in this field, especially in terms of regulation and supervision, is crucial for risk mitigation, refining sustainable business strategies and maximizing the positive contributions of neobanks towards sustainability.

Funding: This research was funded by Slovenian Research and Innovation Agency (ARIS), grant number P5-0027.

Conflict of interest: The authors declare no conflict of interest.

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