

The impact of green financial technology (Fintech) on sustainable development : A case study of Europe

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Abstract

The financial services industry is currently undergoing a major transformation, with digitalization and sustainability being the primary drivers. While both concepts have been researched in recent years, their intersection, which is often portrayed as: "green fintech", remains undefined, and has been addressed. In this research, we explore the reality of green financial technology in supporting sustainable development in Europe by highlighting the role of some environmentally friendly technology techniques to activate growth in green finance and achieve sustainable development.

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1. Introduction

There is no doubt that climate change, its management and mitigation are among the challenges and risks facing our society in the coming decades, and the financial sector plays a key role in this challenge. Sustainable financing has gained increasing importance at the corporate and national levels. However, implementing the Paris Agreement and achieving the sustainable development goals still require large investments of no less than \$3 trillion annually at the national level.

The world and \$1.4 trillion in developing countries, and this goal is financed through government spending as direct financing, in addition to private capital as an additional contribution to achieve this goal.

Study Problem

The study problem can be expressed by asking a main question and a group of sub-questions:

Main question:

- To what extent does green financial technology contribute to achieving sustainable development goals?

Sub-questions:

- What is the impact of using financial technology techniques on sustainable development?
- Why is green finance necessary for sustainable development?
- How does green finance benefit from financial technology?

Study hypotheses:

In light of the main question and sub-questions, the following hypothesis can be constructed: Green financial technology faces great difficulty in applying its techniques to achieve sustainable development.

Study importance:

The importance of the study lies in its presentation of the most important topics that are troubling various authorities globally, in order to provide green financing based on technology to achieve sustainable development goals.

Study Approach:

To answer the questions of the study presented, we relied on the descriptive approach, as it is appropriate for presenting the various theoretical aspects related to financial technology and green finance, so that it depends on describing the phenomenon as it is and analyzing its dimensions, and the analytical approach to study and analyze the impact of green financial technology on sustainable development, in order to reach the final results.

Study Objectives:

- Renewing concepts associated with green financial technology;
- Using green financial technology techniques to achieve sustainable goals;
- Seeing the extent to which Europe is moving as a model for adopting green financial technology.

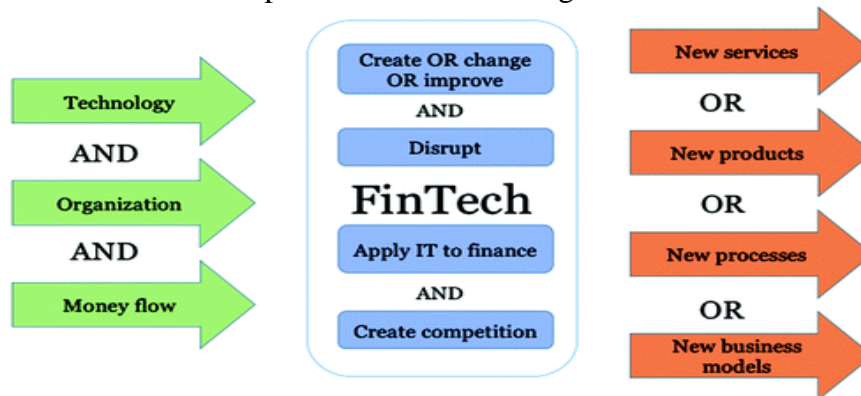
2. Green FinTech and green finance

1.2 Green financial technology

Fintech is generally known first, so we can define its importance in green finance

- The Financial Stability Board (FSB, n.d.) defines financial technology as a technology-enabled innovation in financial services that can lead to new business models, applications, processes or products with a related material impact on financial markets, financial institutions and the provision of financial services. The Financial Stability Board's framework targets specific fintech activities such as fintech credits, digital currencies, robo-advisors, wholesale payments innovations, artificial intelligence and machine learning (FSB, 2017).
- According to the European Commission, FinTech refers to technology-based innovation in financial services. (Bureshaid, 2021)
- According to KPMG, it is a technology-enabled financial innovation that results in new business models, products, processes, or applications that have a material impact related to financial markets, institutions, and the delivery of financial services. (Bureshaid, 2021)

Figure No. 01: Visual representation of the integrated definition of financial technology



Source: (Zavolokina et al, 2017)

Green FinTech focuses on those Fintech-related innovations that address environmental protection and climate change. Green FinTech innovations are defined by a blended value mission that involves the coexistence of impact objectives (e.g., increasing the flow of financial resources for sustainable development) and business objectives (e.g., protecting financial return to be able to continue create long-term impact). (Hoffmann, 2020)

Green FinTech innovation is a new technology-enabled solution for financial services, developed by startups, established technology companies or traditional financial service providers, with the aim of increasing the flow of financial resources for sustainable development. Therefore, financial technology is the use of technological techniques in providing financial services, and green financial technology is used only to protect the environment and achieve sustainable development.

2.2 Green finance

1.2.2 Definition of green finance

Green finance is a broad term that can refer to financial investments that flow into sustainable development projects and initiatives, environmental products, and policies that encourage the development of a more sustainable economy. . Green finance includes climate finance but is not limited to it. It also refers to a broader set of other environmental goals. (Ranchber, 2018)

Green finance (also called sustainable finance or environmental finance) refers to...

Financial activity that aims to protect the environment, and links the financial industry with environmental protection,

Green finance is a financial innovation to meet the needs of environmental protection. (Hoffmann, 2020)

For banks, green finance is financial products and services that take into account environmental factors throughout the loan decision period, and beyond monitoring and risk management; It encourages environmentally responsible investment and stimulates low-carbon technologies, projects, industries and businesses. (Renke, 2018)

2.2.2 Obstacles to green finance mobilization

Green finance mobilization faces several barriers that can be grouped into four main categories:

- Green projects face difficulties in finding sources of financing;
- Fund mobilization and financing flow slows down due to intermediaries involved in a centralized system;
- There are no universal and widely accepted standards to support the reliability of green labels;
- Lack of transparency and accountability.

3.2.2 The importance of green finance

Green financing is necessary for three reasons:

- Promotes sustainable development; The flow of financial instruments and related services promotes the development and implementation of sustainable business models, investment, trade, projects and economic, environmental and social policies.
- Promotes bank innovation, helps avoid risks associated with violating environmental policies; if the borrowing institution is penalized for violating environmental laws, this will reduce that company's profitability and ability to repay, resulting in increased exposure for the bank or lender.
- After the financial crisis in 2008, companies are emphasizing economic, environmental and social coordination in order to create shareholder value.

2.2.3 Benefits offered by FinTech in green finance

- FinTech reduces transaction costs and improves capital efficiency: For example, in green agriculture, big data comprehensively monitors the crop growth environment, such as the degree of R, humidity and water content, use images to determine growth condition, and again, the data collected can be used in financial services in areas such as insurance and credit.
- FinTech makes green finance more inclusive: FinTech will make green finance available to more users and reduce the cost of capital.
- FinTech enhances low asymmetric information and enhances risk management: FinTech will enhance the risk management and risk management ability of the bank. Combining big data with green project data accumulated by banks, it is helpful to identify green project and integrate information related to environmental violation; therefore, financial technology accelerates the decision-making process in green finance and risk management.

The role of blockchain: Financial technology companies use blockchain technology to digitize

green assets. Blockchain ensures the authenticity and traceability of green products and thus mitigates asymmetric information. Real and immutable data is very important. Because it is beneficial for the development of benchmark bonds and asset securitization, the issuance of a credit index, the development of financial derivatives that can hedge risks, and, moreover, the blockchain encourages the formation and liquidity of a low-carbon trading market. (Renke, 2018).

3.2 The development of financial technology deals globally

Financial technology has witnessed rapid development recently in the number of transactions, as the following table shows:

Table No. 01: The top 10 global deals in the field of financial technology for the period: 2017-2019, rows are grouped by year and arranged in descending order according to the value of the deal.

Foundation	City	Country	Value (billion dollars)
<i>Year 2019</i>			
Wordplay	London	UK	50.42
First data	Atlanta, GA	US	00.22
Dun and Bradstreet	Short Hills, NJ	US	90.6
Concardis	Eschborn	Germany	00.6
Assurance IQ	Bellevue, WA	US	50.3
AliExchange	Tallinn	Estonia	10.2
Paytm	Noida	India	70.1
eFront	Paris	France	30.1
Property Exchange Australia	Melbourne	Australia	20.1
Investment Technology Group	New York, NY	US	00.1
<i>Year 2018</i>			
Refinitiv	Eagan, MN	US	00.17
Ant Financial	Hangzhou	China	00.14
Nets	Ballerup	Denmark	50.5
Blackhawk Network Holdings	Pleasanton, CA	US	50.3
VeriFone	San Jose, CA	US	40.3
iZettle	Stockholm	Sweden	20.2
Fidessa Group	Woking	UK	10.2
Ipree	New York, NY	US	90.1

IRIS Software Group	Datchet	UK	70.1
PowerPlan	Atlanta, GA	US	10.1
<i>Year 2017</i>			
DH Corp	Toronto	Canada	60.3
Bankrate	Palm Beach Gardens, FL	US	44.1
Vocalink	Rickmansworth	UK	10.1
Intacct	San Jose, CA	US	85.0
BluePay	Naperville, IL	US	76.0
CardConnect	King of Prussia, PA	US	75.0
Trayport	London	UK	73.0
Institutional Shareholder Services	Rockville, MD	US	72.0
Xactly	San Jose, CA	US	56.0
Merchants' Choice Payment Solutions	Shenandoah, VA	US	47.0

Source: (Di Pietro et al, 2021)

FinTech is currently used in a wide range of fields. It is one of the fastest growing technology sectors recently, with companies innovating in almost every field of finance, including banking, mobile banking, cryptocurrencies, blockchain, artificial intelligence, big data and many more. Of modern technologies. The table shows that the United States of America, with its many states, is considered a major center for financial technology deals, followed by the United Kingdom. (Dorfleitner, 2019).

3. The concept of sustainable development

With the intensification of the growing awareness of countries, bodies, institutions and individuals about environmental and societal issues, a new concept of development emerged that was called sustainable development, the lines of which were crystallized at the Stockholm Conference in 1972, and with the publication of the report of the World Commission on Environment and Development called the Brundtland Commission in 1987, the term development was adopted. Sustainable development in an official and permanent manner, despite the fact that there are many attempts to give synonymous terms to sustainable development. (Renke, 2018).

3.1 Definition of sustainable development

The Brundtland Commission defined sustainable development as: “development that takes into

account the current needs of society without compromising the rights of future generations to meet their needs” (Raponi, 2021, page 32) and the countries of the world agreed at the Earth Conference in 1992 on a definition of sustainable development. In the third principle, which was approved by the Environment and Development Conference in Rio de Janeiro, Brazil in 1992, it is: “The necessity of realizing the right to development so that the developmental and environmental needs of present and future generations are equally met.”

Barbier Edwerd defines it: that activity that leads to improving social welfare as much as possible, while taking care of the available natural resources and with the least possible damage and abuse to the environment. This explains that sustainable development differs from development in that it is more complex and intertwined in what it is. Economic, social and environmental. (Bomedian, 2016, page 31).

The report issued by the World Resources Institute included an inventory of ten widely used definitions of sustainable development. The report divided these definitions into four groups as follows: (Mokhtar, 2017, p. 572) economic, social, environmental, and technological.

Economically: Economic development for developed countries means reducing the consumption of energy and resources, while for underdeveloped countries it means employing resources in order to raise the standard of living and reduce poverty.

Socially, it means striving to stabilize population growth and raise the level of health and educational services, especially in the countryside.

Environmentally, it means protecting natural resources and optimal use of agricultural land and resources

Water. Technology means moving society to the era of clean industries that use technology that cleans the environment and produces the minimum amount of polluting, heat-trapping and ozone-harmful gases. Through the previous definitions, it can be said that sustainable development is: moving towards providing a better life for citizens using available resources while preserving the sources of these resources for future generations.

3.2 dimensions of sustainable development

Among the definitions of sustainable development: development with three linked and integrated dimensions within an interactive framework characterized by control, organization and rationalization of resources.

Sustainable development includes three basic dimensions: economic, social, and environmental. That is, sustainable development is development that does not focus on the environmental aspect only, but also includes the economic and social aspects. Each of these dimensions consists of a set of elements. The following table shows the dimensions of sustainable development and their elements:

Table No. 02: Basic dimensions of sustainable development

Economic dimension	Social dimension	Environmental dimension
Sustainable economic growth	Equality in distribution	Ecosystems
Capital efficiency	Social movement	energy
Satisfying basic needs	Popular participation	Biodiversity
Economic justice	Cultural diversification	Biological productivity
	Institutional sustainability	Adaptability

Source: (Al-Ayeb A, 2011)

The dimensions of sustainable development are within and integrated with each other, and this is clearly evident through the relationship between the economy, environment, and society, as each of these three affects and is affected by the other.

3.3 Sustainable development goals

The sustainable development goals can be presented as follows: (Ismail, 2015, p. 47)

3.3.1 Development goals in the biosphere

Relationships within society contribute to improving the conditions of the surrounding environment by distributing potential risks among the components of social groups, and by solving problems resulting from common ownership. The stronger the social ties are, the more this leads to the protection of joint management of collective property. Social capital has been considered the missing link. In development, work must be done to complete its connection with the components of sustainability.

3.3.2 Development goals in the social environment

There are goals for sustainable development in the social environment, and there is a role for social capital in the development process because it stimulates the effects of social issues. Sustainable development works as a way of thinking by seeking to reach a balance between available resources and basic needs, and achieving social justice between generations in terms of The share of each generation in renewable and non-renewable natural and material resources, rationalizing the use of all resources and setting priorities for their uses, in addition to international and regional cooperation to confront the requirements and problems of the environment.

3.3.3 Development goals in the technological environment

Sustainable development seeks to discover and use technical liquids that have limited environmental damage, and aims to recycle materials and waste and benefit from them in the fields of energy and industry, in addition to rationalizing and improving the selection of sites for industrial projects, and making each project treat its waste and waste, in addition to To benefit from the rapid developments of biotechnology and digital technology, as major changes are expected in the structure of production, its quality, and the time required for production, with new inventions such as digital 3D printers that can make it possible to produce a number of houses in an hour. Just one and more on that, the positive change is due to the rate of use of technology in reaching specific goals through a set of knowledge and skills that has a direct impact on overall economic activity, and ensuring that these skills are used in a way that ensures the absence of social exclusion, which by its presence reflects more Trauma, violence, and society collapsed,

meaning that the integration between the components of sustainable development is extremely sensitive to any change.

4. The contribution of green financial technology to the growth of green finance

FinTech has the potential to mobilize green finance, for example, enabling poor people around the world to access innovative clean energy projects. It can help accelerate the development of green and inclusive financial markets and help realign finance to support sustainable development. It offers the possibility of accelerating the integration of the financial system with the real economy, which in turn will enhance opportunities for achieving greater decentralization and increased participation.

4.1 The most prominent areas and tools of green financial technology and the main platforms

Table 03: Profits, green fintech areas/tools and main platforms

Platforms	Tools/Fields c
Lendosphere (France) Ecomill (Italy) Abundance (UK)	crowdfunding
Drop in the Ocean (Switzerland) Climatrade (Switzerland) SolarCoin (global reach) Power Ledger (Australia)	Blockchain
RepRisk (based in Switzerland but with a global reach) Sustainalytics (Netherlands) Your SRI (available in 14 countries) APG (Netherlands) Ecochain (Netherlands, but available in more than 10 countries)	Artificial intelligence and big data

Source: (Chueca et al, 2021)

One of the key areas of collaboration between fintech and sustainable finance is crowdfunding, which involves either individuals or companies being provided with a large number of small amounts of money from other users via an online platform, so green crowdfunding platforms and apps can help Environmentally sustainable companies can obtain financing and resources in a faster, cheaper, and more affordable way. Blockchain technology enables funds to be protected and circulated decentralized, thus ensuring that they are poured into the specified places. Artificial intelligence and big data analysis are used to collect and process information about companies and their environmental behavior. (Vergara, 2021).

4.2 Green financial technology innovation in achieving sustainable development goals

There are specialized platforms that provide green financial services that contribute to achieving sustainable development goals, and we summarize them in the following table:

Table No. 04: Innovation processes in green financial technology in Germany to achieve sustainable development goals:

Green financial technology innovation	description
	<p>Bettervest is a crowdfunded investment platform focused on renewable energy and energy efficiency. Private, public and non-governmental actors who want to install renewable energy solutions or improve their energy efficiency can upload a project to the digital platform with information about the amount of investment it needs, after which people are able to co-invest from 50 euros and above in the project.</p>
	<p>SDG-Investments is a digital matching platform between investors and projects that contribute to the Sustainable Development Goals. Investors announce which group of investors they want to invest in and how much capital they can invest. Projects announce which of these investors they are contributing to, and then the actors are matched. On the basis of its stated objectives.</p>
	<p>Der Finanzoptimist is a financial advisory podcast that informs its listeners about social and environmental sustainability and governance issues related to traditional investments.</p>

Source: (Susan R & Stimulating G, 2018)

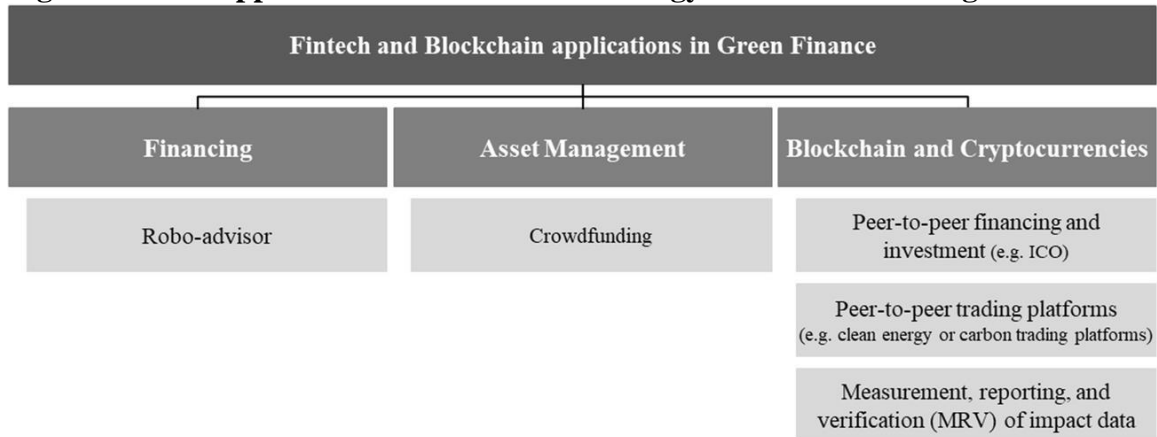
These platforms contribute to providing information and linking lenders and borrowers, thus

raising funds from several parties, especially very small savings, and directing them towards achieving sustainable development goals, and investing the funds in environmentally friendly projects such as renewable energies.

4.3 Applications of financial technology (fintech) and blockchain in green finance

FinTech provides a valuable opportunity to disrupt the financial system and mobilize green finance, through the application of its latest technologies.

Figure No. 03: Applications of financial technology and blockchain in green finance:



Source: (Dorfleitner & Braun, 2019)

4.3.1 Use cases for financial technology companies in sustainable development

Fintech and blockchain have already been linked to sustainability applications. UNEP has identified more than twenty distinct applications of fintech for sustainable development at different levels of implementation, including four applications in the energy field:

- What is attached to the payment resources as you go?
- Flexible energy supply and demand;
- Peer-to-peer renewable energy;
- Distributed generation to the community.

The World Bank has cataloged a wide range of blockchain applications in the financial sector, including money and payments, financial services infrastructure, agriculture, governance, healthcare records, and humanitarian aid applications such as aid tracking and delivery. (Nassiry, 2019). Fintech solutions that use technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and Blockchain can help by reducing these risks, creating audit trails, collecting and analyzing data, and creating greater transparency. A practical example describes how using Blockchain can To reduce the risks of corruption and volatility in the complex external donations scenario, similar approaches to investment are taken by increasing investor or donor confidence in allocating funds to countries or industries that raise concerns about transparency and corruption. These top-down solutions can significantly expand the scope of external investment and assistance, with reducing corruption and administration costs.

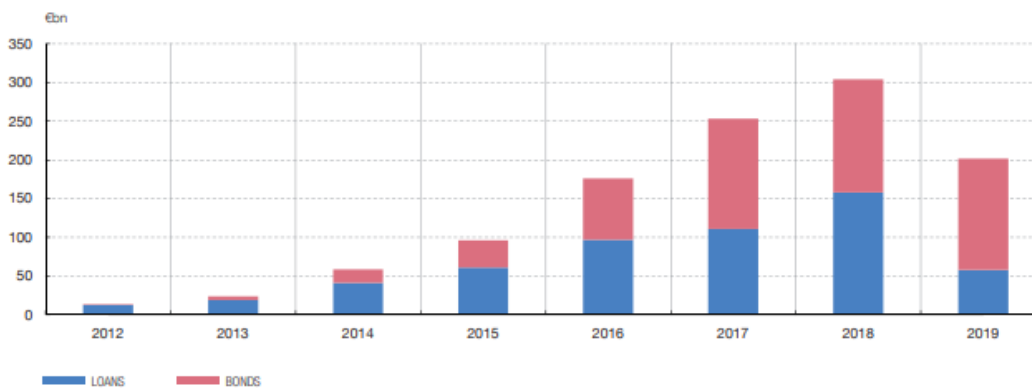
Example of cash flow in an aid pipeline:

The system relies on self-executing contracts supporting an aid campaign, which can be set up for implementation based on the provision of evidence in the form of information such as iris recognition of individuals, or documents such as supplier invoices, which are benchmarked by the system against agreed standards, e.g. In an AIDS treatment scenario, a local NGO might set up a campaign to ensure funds are allocated to support the hospital system, drug suppliers and individuals involved. Once set up and agreed with the global NGO running the campaign, this information is written to the blockchain as a transparent and immutable record.

4.3.2 Sustainable green loans and bonds

They represent the most important ways to transition to a sustainable economy and receive wide attention in Europe. This is evident from their great value, as the following figure shows:

Figure 4: The volume of bonds and sustainable loans issued in Europe:



SOURCE: Devised by the authors from data of Bloomberg Finance LP.

source: (Alonso & Marqués, 2019)

The figure shows the value of green bonds and loans in Europe, which reached its peak in 2018 at a value of 300 billion euros. One of the main innovations in this field is the so-called green bonds and loans, where the debt interest rate is linked to the evaluation of the source, and is considered. These methods are a project financing tool for the transition to a sustainable economy.

4.3.3 Example from Ant Forest: Ant Forest is a project proposed by the financial technology company Ant Financial. (Ant Financial) The company covers a series of financial technology business models such as mobile payment, money management, consumer loans and big data credit. Ant Forest is a green financial system that aims to harness digital technology to finance tree planting. In the application, users of the application raise a tree... Compatible with "green energy", which is collected by paying low-carbon products using Alipay, these products relate to online shopping tickets, metro travel, online payment, electric bill, shared bicycles, electric car charging piles. When the funding reaches a certain size, Ant Finance will plant a real tree in western China. In April 2017, more than 220 million users planted 85 million trees through the app. Environmental protection is no longer limited to the government or the rich. Ordinary people can participate through this application. It improves people's awareness of environmental protection and

contributes to restoring the ecological environment. It also links more investment organizations to green financing. The application makes green life measurable and turns it into A real “transaction” tree, and it is conceivable that as hundreds of millions of consumers and more businesses participate, more and more relevant parts of the green economy will be given financial attributes; Users' low-carbon behavior will be encouraged and environmental awareness enhanced. User behavior will also influence products and services, pushing the entire economy into a green transition. (Blackstad, 2018).

5. Conclusion

The world is currently witnessing a shift towards digitalization in all fields, and the financial sector is not immune to it. The latest technological technologies have been applied in financial services. These conditions negatively affect the environment and climate. This makes it difficult to achieve sustainable development goals. This is why a green economy has been created that supports development and the environment. Naturally, this requires green financing, especially in light of the emergence of green financial technology, which contributes greatly to providing green financing easily and for all parties.

5.1 Results:

- Green financial technology enables sustainable development by providing green financing at the lowest costs and easiest methods.
- Supporting development is no longer limited to governments only due to the magnitude of the projects and the lack of financial returns with the long duration of project completion. Financial technology has now made it possible to collect funding from several parties through crowdfunding technology and through small contributions from a wide audience, enabling the provision of green financing for less. Cost and quick time.
- Europe has come a long way in providing green financing, as there is a large value in the volume of green loans and bonds, which contributes to achieving the dimensions of sustainable development.

COMPETING INTERESTS

The author has no competing interest to declare.

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REFERENCES

- Financial Stability Board (2017). Financial Stability Implications from FinTech Supervisory and Regulatory Issues that Merit Authorities' Attention, Retrieved from: <https://www.fsb.org/wp-content/uploads/R270617.pdf>
- Bureshaid N., Lu K., Sarea A. Adoption of FinTech Services in the Banking Industry. In: Hamdan A., Hassanien A.E., Khamis R., Alareeni B., Razzaque A., Awwad B. (eds) Applications of Artificial Intelligence in Business, Education and Healthcare. Studies in Computational Intelligence, vol 954. Springer, Cham. 2021. https://doi.org/10.1007/978-3-030-72080-3_7
- Zavolokina L., Dolata M., Schwabe G. (2017) FinTech Transformation: How IT-Enabled Innovations Shape the Financial Sector. In: Feuerriegel S., Neumann D. (eds) Enterprise Applications, Markets and Services in the Finance Industry. FinanceCom 2016. Lecture Notes in Business Information Processing, vol 276. Springer, Cham. https://doi.org/10.1007/978-3-319-52764-2_6
- Hoffmann, C. H., & Khmarskyi, V. How green FinTech can alleviate the impact of climate Change -The case of switzerland. Sustainability, 12(24), 10691 2020doi: <http://dx.doi.org.snd11.arn.dz/10.3390/su122410691>
- Susan Ranchber, Stimulating Green FinTech Innovation for Sustainable Development: An Analysis of the Innovation Process, Master thesis in Sustainable Development 2018/26, Examensarbete i Hållbar utveckling, Published at Department of Earth Sciences, Uppsala University (www.geo.uu.se), Uppsala, 2018
- Tao Cen, Renke He, Fintech, Green Finance and Sustainable Development, Advances in Social Science, Education and Humanities Research, volume 291, International Conference on Management, Economics, Education, Arts and Humanities (MEEAH 2018), 2018.
- Di Pietro R., Raponi S., Caprolu M., Cresci S. FinTech. In: New Dimensions of Information Warfare. Advances in Information Security, vol 84. Springer, Cham. 2021, https://doi.org/10.1007/978-3-030-60618-3_4
- Bomedian N, Rural development as an entry point to achieving sustainable economic development, Journal of North African Economies, Volume 12, 2016, <https://www.asjp.cerist.dz/en/article/1867>
- Mokhtar A, The green economy and the bet on sustainable development in Algeria, Journal of Scientific Research in Environmental Legislation, Ibn Khaldoun University of Tiaret, Volume 9, June 2017.
- Al-Ayeb A, Controlling the Comprehensive Performance of the Economic Institution in Algeria in Light of the Challenges of Sustainable Development, a thesis submitted to obtain a Doctorate of Science in Economic Sciences, Faculty of Economic, Commercial and Management Sciences, Farhat Abbas University, Setif, 2010/2011.
- Ismael M, The role of investment in sustainable development (Syria model) Search prepared to get a doctorate degree in economics Department of Economics, Faculty of Economics, University of Damascus, Syrian Arab Republic, 2015.
- Chueca Vergara, C.; Ferruz Agudo, L. Fintech and Sustainability: Do They Affect Each Other?. Sustainability 2021, 13, 7012. <https://doi.org/10.3390/su13137012>

- Susan Ranchber, Stimulating Green FinTech Innovation for Sustainable Development: An Analysis of the Innovation Process, Master thesis in Sustainable Development 2018/26, Examensarbete i Hållbar utveckling, Published at Department of Earth Sciences, Uppsala University (www.geo.uu.se), Uppsala, 2018.
- Dorfleitner G., Braun D. Fintech, Digitalization and Blockchain: Possible Applications for Green Finance. In: Migliorelli M., Dessertine P. (eds) The Rise of Green Finance in Europe. Palgrave Studies in Impact Finance. Palgrave Macmillan, Cham. 2019, https://doi.org/10.1007/978-3-030-22510-0_9
- Nassiry D. The Role of Fintech in Unlocking Green Finance. In: Sachs J., Woo W., Yoshino N., Taghizadeh-Hesary F. (eds) Handbook of Green Finance. Sustainable Development. Springer, Singapore. 2019 https://doi.org/10.1007/978-981-13-0227-5_27.
- Alonso, Andrés and Marqués, J. Manuel, Financial Innovation for a Sustainable Economy, Banco de Espana Occasional Paper No. 1916 (2019), Available at SSRN:<https://ssrn.com/abstract=3471742> or <http://dx.doi.org/10.2139/ssrn.3471742>.
- Blakstad S., Allen R. Green Fintech. In: FinTech Revolution. Palgrave Macmillan, Cham. 2018, https://doi.org/10.1007/978-3-319-76014-8_11.