Challenges of managing banking risks in Light of emerging environmental risks

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Abstract:

The study aimed to clarify the relationship between environmental risks (natural disasters and climate change) and the banking sector, as these risks affect the financial sector and are transmitted to it through several channels, to cause various financial and bank market and operational credit risks, which can be managed by taking them into account and finding ways to measure them. One of the most important findings of this research is that environmental risks lead to systemic financial risks that central and supervisory authorities must provide mechanisms and means to manage them. Forecasting them for mitigation and adaptation, conducting and analyzing scenarios of stressful situations, forming specialized committees in managing banking risks resulting from climate change, encouraging local and international cooperation, and benefiting from various field experiences in this field.

Keywords: environmental risks, management, prudential conrol, stressful situations.

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Introduction:

Environmental risks are one of the important issues in the international arena, as the world is moving within the framework of global environmental governance to study adaptation and mitigating the effects of environmental changes on the future of humanity, as the elements of the environment are a basic source of human activities and civilization, so the limited production and absorption capabilities should be taken into account to ensure the welfare of future generations and the continuity of human civilization, and this is done through the development of policies and procedures necessary for environmental management within the framework of the United Nations program, which is based on international cooperation in supporting and mainstreaming environmental sustainability In development processes, identification of emerging risks, integrated environmental assessment, early warning, and information systems. Given the great link between the financial sector and development, banks must respond to the sustainable development goals by aligning bank financing portfolios with the objectives of the Paris Agreement, developing environmentally friendly financial products, allocating a percentage of

financing to sanitation and clean water projects, and other trends that promote sustainable development.

What cannot be hidden is that the orientation of banks to achieve sustainable development goals will make them face new challenges, most notably environmental and social risks that negatively affect the reputation of banks and financial stability, by integrating environmental considerations into the financing and investment decision that requires appropriate tools and measures to manage risks, environmental risks have an impact on the rest of the risks to which the bank is exposed, whether credit or market risks, so customer environmental risk analysis must be conducted as part of the credit analysis to approve financing applications, The impact of these risks on prices and financial stability must be assessed, and this can only be done by integrating these risks into various prudential control policies, and the challenge that various international organisations have been seeking to achieve since the 2015 Paris Agreement. It is mainly based on the focus on analyzing and measuring environmental risks, environmental governance, stress tests, adding environmental risks in calculating capital adequacy ratio, and others.

What we want to reach through this research is to identify the relationship between environmental risks and banking activity, and the most important challenges facing the banking and financial sector in responding to the decisions of international conferences that seek to achieve a low-carbon economy, as this study came to link the emerging environmental risks and the financial risks on which banking activity is based, which can be formulated as problematic in the following question:

What are the challenges facing banks in managing their financial risks in light of the emerging environmental risks?

Research hypotheses:

The first hypothesis: the impact of environmental risks on the financing decisions of banks and financial institutions.

The second hypothesis: Environmental risks can be managed by including them in macro-prudential control.

Research Objectives:

- Support the subject of environmental risk management with useful information;
- Identify environmental risks and their transmission to the financial sector;
- Knowing the extent to which central financial authorities can find tools and mechanisms to integrate environmental risks into banking risk management.

Research Methodology:

We will try to rely on the descriptive approach, which is one of the most important and most used scientific research methods, by describing the phenomenon based on data collection and processing, to finally reach a detailed description of the study variables and determine the relationship between them.

Research Plan:

The axes of this research have been identified in three axes as follows:

The first axis: emerging environmental risks and ways to transfer them to the financial and banking sector.

The second axis: banks' policies in the face of emerging financial and environmental risks;

The third axis: international efforts in managing environmental risks in the financial and banking sector.

The first axis: emerging environmental risks and ways to transfer them to the financial sector:

In this theme, we will try to identify emerging environmental risks and ways to transfer them to the financial and banking sector through:

Section I: Environmental Risks: The environment is defined as the set of surrounding natural factors that affect the organism and that determine the life system of the group of living organisms located in a place and form a coherent ecological unit (Al-Sheikh, 2002) The environmental framework was also divided into four groups: (Saud, 2003)

- ✓ **Natural environment**: land, climatic conditions, flora and fauna, energy resources, and watercourses, in addition to natural pollution levels and their various sources and their life relationship.
- ✓ **Social environment**: It includes the social characteristics of society, its size, and distribution, as well as social services (transportation - culture - politics - health)
- ✓ **Economic environment**: Various economic activities include various elements of production such as capital, technology, labor, land, and the consequent national and individual incomes that affect economic welfare.
- ✓ **Cultural environment**: It is the medium that includes the apparent and internal patterns of behavior acquired through symbols, which are formed in a certain society of sciences, beliefs, arts, laws, and customs.

Talking about the environment, then, is talking about its natural components and the conditions and factors in which living organisms live (Jebali, 2016).

Environmental risks are expressed in many references as environmental problems that can be divided in terms of "breadth" into two types: (Rifi, 2015)

- ✓ **The first type:** is global environmental problems, which expand to include the world and affect all its inhabitants, such as "ozone - global warming - acid rain - climate change - and others that meet the global description "planetary".
- ✓ **The second type:** is regional environment problems- its existence is limited to a specific geographical region "or between a number of countries" and does not expand its scope and its damage and impact do not reach all parts of the world.

Environmental problems and issues can also be divided based on the degree of social development that crystallizes concern for the environment into two parts: (Rifi, 2015)

- ✓ **Section I:** It includes developed countries with high-growth. Its social reality crystallizes interest in the environment in the topics of "the erosion of the ozone layer - the extent of the ozone hole - follow-up levels of destruction that occurred to the ozone layer - attention to climate changes - a warming of the planet ..... and others.
- ✓ **Section II:** It includes low-developed developing countries and is most concerned with their internal problems (poverty - water scarcity and pollution - air pollution - the poverty of agricultural soil - desertification ... and others) and then comes the interest in the problems of the global environment.

It is noted that the interest in environmental risks varies according to the degree of progress of countries, due to the relationship of economic development to these risks, which led to the formation of global governance to preserve the environment through many conferences and agreements on environmental protection since the first conference in 1972 in Stockholm. This gave the international sense of environmental risks, and one of its most prominent twenty-five outputs is the principle that became the principle for all the declarations that came after it. These principles are summarized in the importance and necessity of international cooperation for the preservation and protection of the environment while continuing development and research and development in the context of solving environmental problems.

The conferences that followed the Stockholm Conference worked to consolidate environmental protection and link it to the economy and development by focusing on a green economy in which carbon emissions are reduced, resource use is more efficient, and accommodates all social groups. (UNEP, 2011)

The 2015 Paris Agreement also aimed to mobilize financing to address environmental risks and climate change in particular, urging that financial flows be aligned with a path leading to climate-resilient greenhouse gas emission development. Greening the financial system by providing

financial services that help increase investment and financing, and manage risks in areas such as environmental protection and energy conservation.

In addition to adopting an open policy to address climate change through commitments, consistency, and engagement, the Glasgow Financial Alliance for Net Zero Emissions was launched to meet huge investment needs that could reach US100$ trillion over the next three decades. The alliance includes more than 250 financial institutions. (Carney, September 2021) As the implications of environmental risk management have shifted to the banking sector, financial decision-makers in many countries are making efforts to incorporate these risks into financial risk management both by mitigating their effects and by adapting to them, while supporting the trend toward green and sustainable finance.

Subchapter II: Transformation of Environmental Risks into Financial Risks:

The G20, the network of central banks and supervisors for greening the financial system has identified environmental sources of financial risk in two types of risk: (NGFS, 2020)

- ✓ Physical risks: these occur from the impact of climatic events, rises in sea levels, and loss of ecosystem services (e.g. desertification, water shortage, degradation of soil quality, marine ecology), as well as environmental accidents (e.g. major chemical leakages or oil spills ...). Physical risks are resulting from damage to property, infrastructure, and land. that affect economies, whether exceptionally or periodically, are difficult to predict.
- ✓ **Transition or transformation risks**: these arise from human efforts to address environmental challenges including changes in climate policies, technological advances, and shifts in investor behavior during the period of adaptation to a low-carbon and more sustainable economy, as investors integrate environmental issues into their investment decisions, either voluntarily or due to increased pressure from environmental associations. This trend affects risk variables and debt valuation... Etc.

Environmental risks move to financial risks, as they directly affect the economy, whether at a micro or macro level below we show the most important effects of environmental risks on the economy and their transition to financial risks.

First: Channels of transition at the microeconomic level:

Environmental risks (physical and transitional) affect the decisions of businesses and households where: individuals lose their incomes due to weather disturbances, suffer health damage, material losses resulting from hurricanes or low-carbon policies, businesses are affected by bad weather by losing their properties, increased expenses, shifting demand and legal liability...

Microeconomic transition channels include the causal factors by which climate risk factors affect banks' counterparties, which may lead to climate-related financial risks to banks and the financial system, as well as direct effects on banks themselves, resulting from impacts on their operations

and ability to finance themselves, microeconomic transition channels include indirect effects on financial assets held by banks such as bonds and credit swaps (Al-Dab, October 2022)

Second: Channels of Transition at the Macroeconomic Level:

Macroeconomic transition channels are those mechanisms through which climate risk drivers affect macroeconomic factors, where the economy is affected by low capital and higher investment, price shifts (resulting from structural changes and shocks), change in productivity (from extreme heat, diversion of investment to mitigation and adaptation, increased risk aversion), labor market disruptions, socio-economic changes (evolution of consumption patterns, migration), other effects on international trade, government revenues, Taxes, production, interest rates, and foreign exchange rates. (supervision, April 2022)

Third: Examples of the transfer of environmental risks to the financial sector:

These risks are transferred to the financial sector where they lead: (NGFS, 2020)

- ✓ Tropical cyclones lead to material damage to real estate assets located in coastal areas (market risk) and the decrease in the value of property reduces the value of guarantees (mortgage) and disrupts economic activities, which leads to an increase in default rates and expected loss to banks (credit risk)
- ✓ Floods disrupt supply chains and factory operations for some non-financial companies (due to electricity and transportation outages, for example), as these companies are considered customers of banks and thus threaten the continuity of banks' work, and the turmoil that these companies know increases maintenance costs and reduces revenues, which reduces their profits and weakens their ability to repay their bank loans (the risk of non-payment of loans, and increase in default rates) credit risks. Insurance companies that offer flood insurance are also exposed to reduced asset liquidation with a loss to cover claims (liquidity risk)
- ✓ High temperatures reduce worker productivity (operational risk), and disruption of transportation and power generation, leading to increased maintenance costs and lower profits, leading to higher default rates (credit risk).
- ✓ Drought and water scarcity lead to energy shortages, which reduces revenues and increases operating costs in companies, especially those that rely heavily on water (such as specializing in agriculture, food processing, textiles, dyeing, etc.), which leads to changes in revenues and high costs, which makes these companies unable to meet their obligations to banks (credit risk).
- ✓ Environmental accidents (oil spills) lead to serious pollution of water and land, exposing them to penalties (reputational risks) and lawsuits and penalties lead to additional costs, discrediting these companies and reducing their sales, which leads to a decrease in their

valuation (market risk) and an increase in the likelihood of their default in repaying the loan (credit risk).

The second axis: banks' policies in the face of emerging financial and environmental risks;

In this theme, we will try to address the most important policies and procedures taken by banks to face the financial risks resulting from environmental problems through:

Subchapter I: Banks' Attitudes Towards Managing Financial Risks Arising from the Environment:

In the previous axis, we found that environmental risks are transmitted to the financial sector through several channels, and thus constitute various types of financial risks as follows: (Youssef, 2022)

1- Credit risk: The exposure of banks to high losses as a result of material risks, leads to an increase in leverage and a reduction in loan activity (to maintain their ability to repay). This could amplify the shock to the real economy to the extent that it leads to greater losses for banks, and thus to a further decline in bank lending. This effect may be exacerbated by any increase in the cost of financing banks and reductions in profitability, which could further weaken the Solvency of banks and leads to a reduction in loans.

2- Market risk: Increased physical risk leads to high market risk and risk of impairment of financial assets, which leads to losses for banks, asset owners, and other financial institutions, market risk may also appear due to sudden increases in the value of risk due to uncertainty about the future profits of financial assets and volatility in the market.

3- **Liquidity risks**: related to the withdrawal of deposits the state of panic and uncertainty caused by natural disasters.

4- **Operational risks**: represented in the possibility of natural disasters affecting their assets and human and technical resources.

Banks must integrate exposure to environmental risks into their overall risk management processes, such as the following: (Youssef, 2022)

- ✓ Tightening control or rules directed at non-environmentally friendly or high-emission institutions,
- ✓ Identify the main environmental risks at the level of clients, investors, and financing portfolios, which are represented in identifying sectors with high environmental risks and assessing their potential impact on the bank, and the bank can rely on international sustainability standards for environmental risk management to identify sectors with the highest environmental risks;

- ✓ Integrate environment-related risks into borrower's credit risk assessments and investment decisions;
- ✓ Integrate environmental risk management into enterprise-wide governance, strategies, and risk management;
- ✓ Use scenarios related to identifying and assessing the potential impacts of climate change in stress tests.

Environmental financial risks comply primarily with systemic risks, and therefore prevention falls within the scope of the macroprudential policy. (Berenguer, Cordona, & Evain, 2020) Banking regulatory authorities and central banks should adapt and establish tools to manage environmental financial risks such as:

1- Amending capital requirements to integrate environmental risks related to assessing the resilience of banks, closing the current climate investment gap to support the low-carbon transition, on the one hand, and implementing specific prudential regulations for green assets to ensure compliance with environmental and social objectives. (Berenguer, Cordona, and Evain, 2020)

2- Modifying the methods of calculating the solvency ratio, by imposing restrictions on the "percentage of financing directed to projects with high carbon emissions", imposing capital financing that is larger and more expensive than borrowing on banks and supporting green finance; (Youssef, 2022)

3. Setting limits on direct loans to high-carbon sectors or imposing mandatory reserves on their financing;

4- Encourage and support banks to adopt current best practices in environmental risk management, collect the necessary data, and conduct analysis to Understand the banking sectors of the system and their ability to address environmental risks in the future;

5. Promote market discipline where banks should disclose information and methods for uniformly measuring environmental financial risks across countries.

Subchapter II: Methods of Measuring Environmental Financial Risks:

The Basel Committee report entitled "Methodologies for Measuring Financial Risks Related to Climate Change" stated that there are main methods for measuring financial risks resulting from climate change, which are currently applied by banks and supervisors, as most practices include: (Supervision B. C., 2021)

1- Climate risk classification:

This method combines a risk classification scheme with a set of criteria to determine the degree of risk exposure according to a specific classification. The criteria used in this method can be based on qualitative or quantitative factors that help banks and supervisors to determine the relative climate exposure score of current and projected credit brokerage. Climate risk classification methodologies and criteria are based on a set of methods that are constantly being developed using very accurate data. (Al-Dab, October 2022)

2. **Scenario Analysis:**

The climate scenario is analyzed by a forward-looking projection of risk outcomes, where the analysis process goes through four steps:

- ✓ Identify physical and transition risk scenarios;
- ✓ Linking the impacts of scenarios to financial risk;
- ✓ Counterparty assessment and the sector's sensitivity to such risks;
- ✓ Extrapolate the effects of these sensitivities to calculate the measure of total exposure and potential losses.

Scenario analyses are long-term in scope and are used to assess the potential impacts of climate risk drivers on the financial sector. (Al-Dab, October 2022)

3. **Pressure Test:**

This method is used to assess the short-term resilience of the financial institution to economic crises and highlights the importance of the Central Bank developing stress tests that include hypotheses of gradual intensity, including the potential impact of natural disasters and climate change on the banking sector, and hypotheses that can be taken, for example, material losses in the assets of the financial sector and the investment portfolio, losses in the property of individual and corporate customers, and the occurrence of natural disasters in the country of the parent bank or bank branches outside the borders of the country or correspondent banks in other countries. (Joseph, 2022)

4. **Sensitivity analysis:**

Sensitivity analysis is used to assess transition risk to assess the potential impacts of a particular climate policy on economic outcomes.

5- **Natural Capital Analysis:**

This analysis considers nature as a capital natural reservoir, thus assessing how degradation in nature negatively affects a financial institution. This analysis is carried out in four steps: (Supervision B., 2021)

- ✓ Identify geographic areas, sectors, borrowers, and related assets;
- ✓ Inventory of relevant natural capital assets (e.g. water, clean air, forests);
- ✓ Identify possible natural disturbances,
- ✓ Identify geographic areas, sectors, borrowers, and assets that are most at risk.

6- Climate-endangered value: This method determines the effects of climate on the value of financial assets over a specific period, and with a certain probability under possible climate scenarios.

The third axis: international efforts in managing environmental risks in the financial and banking sector.

Several organisations have been formed to identify these risks and develop guidelines and principles to deal with them, and some countries have prepared stress tests to measure the robustness of their financial systems against the effects of environmental risks.

Section I: General Guidelines for Climate Financial Risk Management.

Based on the various recommendations and guidelines issued by the aforementioned international organisations, it is possible to envisage a general framework that banks and supervisory authorities can use to manage financial risks arising from environmental risks, as follows:

1- **Governance**: The Bank's Board of Senior Management must take into account the financial risks resulting from environmental risks to understand and evaluate them, and clarify their impact on the Bank's resilience in the short, medium, and long term or on its capabilities to achieve its objectives through: (Supervision, 2022)

- ✓ Integrate environment-related financial risks into the Bank's overall business strategy.
- ✓ Reported to the Bank's administrators and employees;
- ✓ Banks must clearly define the roles and responsibilities associated with managing climate-related financial risks throughout the Bank's organizational structure.
- ✓ Ensure that relevant functions and business units have sufficient resources and expertise to effectively meet responsibilities related to managing climate-related financial risks. Where there are specialized climate units, their responsibilities and interaction with existing governance structures must be clearly defined.

2- **Risk Management**: Banks should classify and identify financial risks related to environmental risks through: (Supervision, 2022)

- ✓ Identify and understand how environmental risks affect the value of assets and financial instruments in their portfolios, assess the potential risks of losses and increased volatility in their portfolios and establish effective processes to control or mitigate associated impacts,
- ✓ Banks must understand the impact of these risks on their liquidity and ensure that liquidity risk management systems take them into account.
- ✓ Assess these risks and their impact on their ability to continue to provide critical processes and their impact on business continuity;
- ✓ Banks should also identify, measure, evaluate, monitor, report, and manage concentrations within and between the types of risks associated with climate-related financial risks. For example, banks can use metrics or heat maps to assess and monitor the concentration of exposure to geographic areas and higher-risk sectors.

3- **Management monitoring and reporting**: Banks should compile data and risk reporting practices: (Al-Arabi, 2020)

- ✓ Develop qualitative and quantitative measures or indicators for the assessment, monitoring, and reporting of financial risks resulting from the environment,
- ✓ Engage customers and counterparties and collect additional data;
- ✓ Timely reporting and regular updating;
- ✓ Adopt a disaster information policy to reassure depositors and investors;
- ✓ Provide the Central Bank with a comprehensive report on the evaluation of its plan in dealing with natural disasters, the extent of success and failure in managing the crisis and the emerging human and material losses, and proposals for developing its plans to address the shortcomings identified during the disaster.

4- **The role of central banks and supervisors**: Central banks must adopt a risk management policy that includes the repercussions of environmental risks (climate change and natural disasters) and how to deal with them through: (Al-Arabi, 2020)

- ✓ Integrate environmental risks into the monitoring of financial and banking stability;
- ✓ Forming a committee specialized in natural disaster management (by defining the tasks and responsibilities assigned to it) and preparing hedging plans to achieve recovery and return to normal work.

- ✓ Establishing a cooperation charter that regulates the coordination and exchange of information between the Central Bank and organisations and research centers concerned with the environment and natural disasters within the framework of a strategic partnership;
- ✓ Qualifying trained and qualified cadres in the field of natural disaster management and developing their capabilities by providing them with appropriate training on an ongoing basis;
- ✓ Ensure that banks consider a range of mitigation options to manage and control the risk;
- ✓ Ensure that banks have a scenario analysis that suits their size, business model, and complexity;
- ✓ Take advantage of modern technologies and promote their use, as the implementation of digital financial operations contributes to reducing business interruption during natural disasters;
- ✓ Strengthening international and local cooperation and benefiting from previous experiences in this field.

Section II: Experiences of some countries in integrating environmental risks into the financial sector:

The process of integrating environmental risks into the financial sector is still in its infancy, as central banks are working to find the best ways to address financial risks caused by natural disasters on the one hand and move to a low-carbon economy on the other, as the Bank of England released climate stress test results that showed that UK-based banks could incur losses of 225£ billion (265$ billion). by 2050, and insurers face a 15 percent decline in asset values "under the worst-case scenario." In the opening climate stress tests, the ECB said euro-zone banks could incur losses of up to 70 billion euros (70$ billion) in the event of a disorderly transition to a green economy. These findings significantly underestimate the risks posed by climate change because only specific portfolios have been subjected to stress testing and have not included the shocks modeled in the broader economic downturn. (GREEN, 2022)The Central Bank of Brazil also sent questionnaires to major Brazilian financial institutions to gather insights on how banks manage climate-related financial risks within their risk management processes, aspects such as exposure assessments, climate scenarios, and stress testing as well as internal governance were included in these surveys (Board, 2022) The Saudi Central Bank is forming an internal team to identify the most prominent changes in international standards and practices for climate-related risks through surveys (Yousef, 2022) In January 2022, the Central Bank of the UAE issued the "Guidelines on Sustainable Finance" and these principles serve to stimulate the implementation of the sustainability program in its business activities, decision-making, and risk management. The plans of UAE Central bank to integrate climate risk assessment, monitoring, and stress testing into its operational plan, and began conducting an awareness and inventory survey on

banks' climate risk management practices in 2021. (Youssef, 2022). Central banks continue to challenge financial risks arising from environmental risks by joining the network of central banks and financial supervisory organisations aimed at transitioning to a green financial system, which currently includes about 121 central banks and 22 supervisors, representing together five continents and more than 85% of global greenhouse gas emissions, and they are supervisors of all systemically important global banks and 80% This body shares best practices, contributes to environmental development and risk management, and mobilizes mainstream financing to support the transition towards a sustainable economy. (NGFS, https://www.ngfs.net/en, 2023)

Conclusion:

At the end of this research, it can be said that the environment with its changes has become an important element that must be included in all economic and financial decisions, and banks must raise the challenge to face the banking and financial risks resulting from environmental risks, whether physical risks or the risks of transformation and transition to an environmentally friendly green economy, and among the findings are the following:

1. Environmental risk is the possibility of an event or accident resulting from the activity of the enterprise that could lead to harmful repercussions on the environment;

2. Environmental risks are divided into physical risks and the risks of transition or transformation;

3. Environmental risks affect the decisions of business and household , leading to financial and banking risks;

4. The macro-economy is affected by environmental risks through low capital and high investment, productivity changes and price shifts, and labor market disruptions, among others;

5. Exposure of banks to high losses as a result of physical risk leads to an increase in leverage and a reduction in loan activity (credit risk);

6. Increased physical risk leads to higher market risk and a decrease in the value of financial assets (market risk);

7. The panic and uncertainty caused by natural disasters lead to the withdrawal of deposits (liquidity risk);

8. Banks should integrate environment-related risks into borrower's credit risk assessments and investment decisions, into governance and use scenarios for identifying potential impacts in stress tests;

9. Develop methods and mechanisms for measuring financial risks resulting from environmental risks, and adopt an information policy during disaster times to reassure depositors;

10. Take advantage of modern technologies and promote their use in banks as digital operations reduce business interruption during disaster periods;

11. Central banks and supervisory organisations should expand and strengthen cooperation between them to disseminate best practices and mobilize mainstream financing to support the transition towards a green economy.

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