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A prospective study on the use of green finance in financial institutions: Features of Chinese experience

Assis. Pro. Dr. Salim Sallal Al-Hisnawi¹, Assis. Prof. Dr. AkeelShakir Al-Shara²

^{1,2}(Department of Finance and Banking, University of Qadisiyah , Faculty of Management and Economics) http://qu.edu.iq/ade

Abstract:

The aim of the research is to identify the reasons for the emergence of this type of funding and the challenges it faces and for all types and sectors, As well as its importance as a platform for many participants, including individuals, commercial consumers, producers, investors and financial lenders. The Chinese experience was the first to identify green financial products as it was the first in the G20 Which played a crucial role in the world's ability to reach a climate agreement in Paris. The research concluded that a broader application of green financing could be facilitated by Through better knowledge sharing, capacity-building, stronger policy signals and better clarity in the definitions of green financing activities, While recommending the provision of references and strategic frameworks for environmental and economic policies to investors with regard to the strategic framework of green investment to achieve the goals of sustainable development and the Paris Agreement.

Keywords — Green financing, green investment, green bonds, green loans.

I. INTRODUCTION

Green finance has emerged in Western countries, The first problems faced by those countries were the environmental problems resulting from fossil fuel consumption and manufacturing. China, for example, will greatly benefit from drawing on its expertise With the integration of fiscal policies, institution-building and facilitation of product innovations to promote green investment.

Green financing may provide opportunities for growth as well as environmental benefits . The promotion of green financing will facilitate the growth of green industries with high potential, promote technological innovation and create business opportunities for the financial industry. For example, renewable energy represents about 62.5% of the net additions to global.

Providing adequate funding to green sectors with high market potential can therefore be a boost to growth. As that clean technology, energy saving and environmental treatment sectors tend to be high-tech, coupled with higher research and development spending that catalyzes technological progress. The development of green financial instruments such as green loans, green bonds, green investment funds and funds such as green indexes and ETFs also means business opportunities for many financial companies, so the research focused on four main points, the first was the methodology of research in terms of objectives and importance and the problem of research, while the second point on the conceptual aspect of green financing, including the concept and importance and motives and challenges of that funding, and focused on the third Chinese experience in this area of Where the types of

financial products used, to end the search conclusions and III. recommendations as a final point.

II. SEARCH METHODOLOGY

The importance of research A.

represented by the following:

- Recognize that green financing is a phenomenon that combines finance and business with environmentally friendly behavior. It is the arena for many participants, including individuals, commercial consumers, producers, investors and financial lenders. Green financing can be expressed differently depending on the participant and can be driven by financial incentives.
- Demonstrate proactive and environmentally friendly behavior, such as promoting mass transport or recycling of used goods. Green financing is concerned with avoiding the promotion of any business or activity that can harm the environment now or for future generations.

B. Research Objectives

The research aims to:

- Identify precisely this type of financing through which financial institutions offering loans to individuals, small businesses or large companies can do so in an environmentally friendly manner. In this type of green financing, it is possible to understand the possibility of using loans to promote the spread of renewable energy.
- The research aims to identify the reasons for the emergence of this type of funding and the challenges it faces and for all types and sectors .

Take note of the experiences of countries in this regard, especially the Chinese experience.

C. Research problem

We can identify the problem with the following questions:

- ? Is there a specific concept for this type of funding •
- ?• Can all financial institutions use it

Are there any necessaryreasons behind the need• for this type of funding?

? What are the challenges facing those involved.

III. CONCEPTUAL ASPECTS OF GREEN FINANCING

A .Green financing concept

He explained (1) that we do not yet have an accurate and acceptable definition of green finance in financial literature, due in large part to two reasons:

First, there are many publications that do not attempt to define the term - for example IFC (2013), which emphasized "mobilizing public and private funds to invest in overall green growth in developing countries - an expanded assessment report prepared by the G20 Development Working Group, IFC Climate Business Management; nor researchers Spratt and Griffith-Jones (2013), who showed "mobilizing investment for overall green growth in low-income countries", the German Agency for International Cooperation (GIZ). Second, the proposed definitions vary widely among the few definitions that can be found in the financial literature as follows:

He stressed (2) that green financing is a broad term that can refer to financial investments that flow into sustainable development projects and initiatives, environmental products and policies that promote the development of a more sustainable economy. Green financing includes, but is not limited to, climate financing. Green financing includes, but is not limited to, climate financing.

It also refers to a broader range of "other environmental objectives, Such as combating industrial pollution, sewage and protecting biodiversity. Mitigation and adaptation finance refers specifically to climate change associated with activities. The financial flows of housing refer to investments in projects and programs that contribute to the reduction or avoidance of greenhouse gas emissions, while the financial flows of adaptation refer to investments that contribute to reducing the vulnerability of goods and people to the impacts of climate change.

He explained (3) that Green financing is often used interchangeably with green investment, but green financing is, in practice, a broader lens of investment, as Bloomberg knew,

which is financing new energy, etc. More importantly, it includes operational costs Green investments that are not included in the definition of green investment. More clearly, they will include costs such as project preparation and land tenure costs, both of which are not only important but can pose distinct funding challenges.

And focused (4) that "green financing" for the banking sector is financial products and financial services, in the context of considering environmental factors during lending decision-making, subsequent monitoring and risk management processes, to promote environmentally responsible investments and to stimulate carbon reduction technologies, enterprises, industries and businesses.

He explained (5) that green financing includes all forms of investment or lending that take into account environmental impact and promote environmental sustainability. The key element of green financing is sustainable investment and banks. Investment and lending decisions are based on environmental screening and risk assessment to meet the criteria Environmental sustainability.

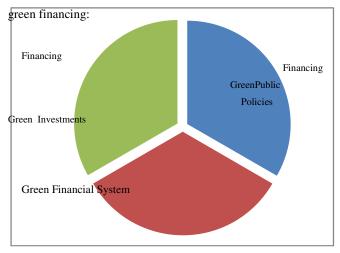
B. Green Financing Components and Objectives

Green financing includes:

- 1) Financing public and private green investments (including preparatory work and capital costs) in the following areas:
- o Environmental goods and services (eg water management or protection of biodiversity and landscapes) ... * Eurostat defines environmental goods and services as "goods produced for the purpose of preventing, reducing and eliminating pollution and any other degradation of the environment (environmental protection), Maintain natural resource stocks, and then protect against depletion (resource management.
- 2) Public policy funding (including operational costs) that promote the implementation of mitigation or adaptation projects and initiatives (eg renewable energy tariffs).(
- 3) Components of the financial system that deal specifically with green investments, such as the Green Climate Fund or financial instruments (eg green bonds and green structured

funds), including their specific legal, economic and institutional conditions . (6)

We can clearly say that climate financing is just one aspect of green financing, Which focuses in particular on adapting to the effects of climate change or reducing greenhouse gas emissions. Figure 1 shows the components of



Of green financing Components Figure(1)
Source: (1) Lindenberg , Nnnette, (April 2014) "Definition of Green Finance"www.die.gdi.de

Table (1) shows the motives for green investment

Table (1) Green Investment Motives

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Financial considerations	Non-financial considerations	Reputation	Compliance and credit obligations
Standard return criteria Expected returns from A green companies or assets	Environmental	• The reputation of the investor and the investee companies	•Local law and instructions (eg in the form of SRI policy (ESG disclosure,
Standard risk criteria -Volatility, downside risk, VaR, default risk, etc.	• Scientific	•pressure by politicians, media, NGOs, etc	•International conventions (such as the United Nations (Global Compact
Normative diversification criteria - Link (possibly lower) green assets with other assets.	• Ethical and religious	•intangible assets , such as" community " investment	Voluntary industry rules and principles (for example, UN PRI The Carbon Disclosure , Project (CDP) and the Reporting Initiative .
Considerations on long-term risks -Non-standard risk standards and reduction of catastrophic risks by reducing long-term carbon emissions	Political and social	Marketing management	•Disclosure
Internationalization of external factors (negative and positive) (or "global ownership") through - Taxes and subsidies - Group work for investor groups	Other rules Double bottom line or		Good governance codes for investors and institutional institutions, corporate social responsibility (CSR). Part of the credit commitments
	triple bottom line		

Source: (7)Greening the Banking System Experiences from the Sustainable Banking Network. Input Paper for the G20 Green Finance Study Group." Sustainable Banking Network. International Finance Corporation (IFC). 2016 Web. Oct. 22, 2016. http://unepinquiry.org/wp-content-uploads/2016/09/4_Greening_the_Banking_System

C .Challenges to green financing

Despite some progress, the development of green financing continues to face many challenges. Less than five types of challenges to green financing can be highlighted, and some examples of local and market practices can be presented for how they may be addressed or perhaps addressed within the financial sector. Four of these challenges (external factors, green definitions, information and analytical capacity) are largely defined for green projects, while maturity mismatch is common to most long-term projects, and clear policy guidance

can address some of these challenges .In many countries, fragmented political responses are the primary concern and sometimes distract from efforts to develop effective responses. It should also be noted that, in addition, , Challenges may arise from inappropriate policy measures that aggravate external environmental factors; however, these issues need to be addressed separately.

Many other factors also contribute to the lack of green investment. These measures include, for example, fossil fuel subsidies, ineffective environmental regulations, inconsistent public policies, the failure of the accounting system to absorb environmental costs / benefits, the underdevelopment of financial markets and financial institutions, and the approach of foundations to education for finance and the environment. Some of these issues need to be addressed by policy actions that go beyond funding. (8).

1) External factors:

The first and most important challenge is how to absorb environmental externalities in an appropriate and costeffective manner. These external factors can be positive for green investments, with their benefits on three sides and negative when investments that damage three parties are polluted. Difficulties in absorbing these external factors lead to a lack of investment in "green" activities and overinvestment in " brown" activities. Examples of positive external factors and negative external factors include . the same time, in some countries, financial sector measures such as credit enhancements and guarantees, soft loans, grants and interest rate support have been tried to improve the returns of these risk-adjusted projects. "Examples include green loan guarantees (Netherlands, United States and India) (IFC), interest subsidy (Australia, Belgium, China and Germany), concessional loans (China and India) and green tax credit for the bonds(US) .(9, 10).

A water treatment or land treatment project may lead to a qualitative improvement In the community and the market value of residential properties in the region. However, without appropriate mechanisms to generate income from some of

these positive external factors, the project may not generate sufficient return to attract private capital. To address these problems, some countries have adopted the PPP approach, which involves, for example, real estate experts in a water treatment or land treatment project. The excess return from the real estate project (due to the improvement of the environment in the future) is effectively used to compensate investors from the green project. Similar business models have been used in some countries and regions to support metro projects (Clean transportation) by combining them with residential and commercial real estate projects near metro stations, as the first will enhance the market value of the latter. "Examples of PPP projects include waste treatment projects (Canada), railways High-speed (France, Spain, South Africa and Japan), the subway (Hong Kong, Singapore and the Philippines).(11).

2) Maturity mismatch:

The maturity of maturity is evident among savers who demand liquidity and long-term projects that require investment among key functions of the financial system, particularly through the banking sector and through bond markets. The average maturity of bank loans in many major markets is only about two years, Based on data from the US Federal Reserve, the Bank for International Settlements (PBOC), and international bank statistics (BIS) at the Bank for International Settlements (BIS) at the end of December 2015.

On the other hand, the average maturity of the 178 green bonds issued in 2015 is 9.4 bonds, and the maturity mismatch problem is exacerbated in cases where green investments rely more on long-term financing than traditional investments in the same sectors. For example, the initial cost to build a typical energy efficiency building that is higher than less energy-efficient construction, the solar or wind project has a higher share of capital expenditures (capex) and pre-invested operational expenditure (OPEX) compared to the coal-fired power plant that will be spent Of the total cost over life to pay for energy to operate, which can be funded for the shortest

time, while sustainable construction, wind or solar projects will not be.(13).

3) Lack of clarity in green finance:

In many countries and markets, lack of clarity about green financing activities and products (such as green loans and green bonds) can be an obstacle for investors, companies and banks seeking to identify green investment opportunities. Without adequate definitions of green financing, which is the basis for internal budgeting, accounting and performance measurement for financial institutions, it is difficult for them to allocate financial resources to green projects and assets. In addition, lack of clarity may also deter environmental risk management efforts, institutional communication and policy design. Individual definitions suffer from the risk of inadequate expression of different contexts and priorities in different countries or markets. On the other hand, there are too many definitions. For example, each financial company identifies its own green assets - which can also be very costly to compare institutions and markets and to cross-border green investment. Examples of countries that have taken initiatives to develop national definitions of green credit include Bangladesh, Brazil and China .(14).

4) Asymmetric information:

Many investors wish to invest in green projects / assets, but non-disclosure of environmental information by companies increases the "search costs" of green assets and thus reduces their attractiveness. For example, if investors do not have information about the environmental performance of portfolio companies such as emissions, energy and water consumption, they cannot identify and fund green companies proactively, as well as environmental risk assessment and management.

The practices adopted to address this problem in a number of countries include demonstration projects by state-supported entities such as the UK Green Investment Bank or the Multilateral Development Banks (MDBs), and clarity on policy expectations for sustainable development (Such as Malaysia's National Green Technology Policy, the Kingdom

of Saudi Arabia Vision 2030 , Investment by Norwegian banks), green bond investments by Germany's KfW, as well as credit guarantees by government agencies (such as the US Department of Energy's Loan Guarantee Program for Renewal, Energy Projects) or development finance institutions (such as the CHUEE program at the International Finance Corporation (IFC) . (15).

5) Inadequate analytical capabilities:

General understanding of the financial implications of environmental risks by financial institutions is still at an early stage. Many banks and institutional investors still need to develop the ability to identify and measure the credit and market risks that may arise from an environmental survey, thereby often underestimating the value of "brown" investments and over-estimating risks associated with green investment opportunities. As a result, there is still a lack of investment in pollution projects and greenhouse gas emission projects and a lack of investment in green projects, Better understanding of environmental risks is therefore necessary to better mitigate risks, allowing external environmental factors to be more effectively absorbed into the decision-making process, thereby mobilizing funding for green investment. From the above, the overall challenges facing green financing can be illustrated in Table (2).

Challenges	Banking services	Bond market	Institutional	Practices
			investors	Country / market practices to address
				challenges
External factors	inadequate compensation for positive externalities of green			As well as financial and
	;projects			environmental policies: there are
	Insufficient penalties for negative externalities of •			guarantees, soft loans, PPP, pilot
	contaminated projects			projects, adoption of principles and
	Insufficient price signals •			methods of risk management, green
				.labeling, etc
Maturity mismatch	Lack of appropriate financing tools for long-term green			Green bonds, secured lending
	projects			
Lack of clarity in	Lack of definition of	Lack of definition	Lack of	Development of green definitions
green definitions	green loans	of green bonds	definition of	and indicators
			green assets	
Information	Lack of information	Lack of information	Lack of	Guidelines for voluntary disclosure
asymmetry	about borrowers;	and monitoring the	information	of environmental impact and related
	excessive risk	use of proceeds	on assets	financial risks, verification of green
	aversion		(environmenta	bonds, and risk mitigation, policy
			l impacts and	signals, pilot projects and key
			(risks	investments
Lack of analytical	Lack of capacity to	Lack of capacity to	Lack of	Risk modeling, training,
capacity	assess impact on	assess impact on	capacity to	assessments, and indicators
	credit risk	credit risk	assess the	
			impact of	
			asset	
			valuation	

Table 2: General challenges for green financing

Source(16) UNU-IHDP/UNEP (2014). The Inclusive Wealth
Report 2014. Cambridge University Press.

http://inclusivewealthindex.org/.

IV: Chinese experience in green financing:

China's experience in green finance is guidedby three national climate goals:

1)peak carbon dioxide emissions in 2030 and aim to peak before 2030 if the non-fossil fuel portion of the country's energy mix can be increased from 11.2% at the end of 2014 to about 20% in about 2030.

2)Reduce carbon intensity - the amount of carbon emitted per unit of GDP or GDP - to 60% to 65% below 2005 levels in about 2030.

China already has a number of domestic policy measures in place to move it towards these climate targets. These measures include increasingly stringent standards regarding energy efficiency for vehicles, industrial equipment and appliances. Renewable energy producers pay a premium for the energy generated.

3) The peak emission of coal and emission reduction achieves ambitious targets, especially in areas where, when combined, they produce more than 66% of China's GDP in 2014. (17).

There are some typical practices to promote green finance internationally.

The following types of financial products are green:

.A. Green lending

Green lending typically refers to supporting products such as preferential interest rates offered by banks for environmentally friendly projects or project restrictions with negative environmental performance. Green lending includes home mortgage personal loans, as well as auto loan engines and green credit card services, along with project finance, Lending and construction, and leasing equipment for companies.

With regard to corporate loans, Equator Principles are general principles of international voluntary green lending. According to Equator Principles, banks must refuse to provide and finance borrowing companies that do not comply with the Social and Environmental Equator Principles. For the first time in history, Equator Principles provides clear and specific environmental and social criteria for project financing in 2013. Equator Principles have been accepted by 78 financial institutions from 35 countries and total project financing for more than 86% of the total market. (18).

China has already issued some regulations and policy documents on green credit (including views on the implementation of environmental protection policies and the executive regulations for the prevention of credit risk, guidelines on credit issuance for energy conservation, emission reduction and green credit guidelines). Green credit policies are aimed to limit loans to polluting and energyintensive companies with limited emphasis on measures to promote the issuance of loans to the environmental protection industry and environmentally friendly companies . To promote the principles of moderation, the Ministry of Environmental Protection published the translated version of international experience in promoting green credit: Equator Principles , IFC Performance Standards, IFC / MEP 2008. However, Equator Principles has not yet been widely adopted by Chinese commercial banks and China Industrial Bank

(CIB), Which became one of the banks for the signatories of the Equator Principles . (19)

B.. Green private equity and project investment fund Large-scale green direct investments are now under international control and financial conglomerates with the participation of some professional investors. There have also been several investment experiences aimed at expanding investment in environmentally sustainable entrepreneurship. In 1999, the World Resources Institute launched a project called NeW Ventures with financial support from Citibank. The project is dedicated to investment in small and medium-sized enterprises from environmental industry in emerging market economies.

Between 1999 and 2012, this project helped 367 small and medium-sized enterprises (SMEs) to realize the "significant environmental benefits generated" in receiving the project's total investment of \$ 370 million and contributed to a cumulative reduction of 3.3 million tonnes of carbon dioxide, Protecting 4.5 million hectares of arable land, and conserving and purifying 5.7 billion cubic meters of water. (20).

C.Green financing and mutual funds

There are a large number of high-liquidity green financial products already available outside the financial markets. Many of which are indicators of the banking fund, fund products and others are derivatives of carbon emissions rights. The products have attracted large-scale investors including individuals. The key indicators currently traded internationally are: (Index Energy Clean Global Poor's & Standard, which covers 30 major clean energy companies from around the world), the Clean Green Energy Index (NASDAQ) (covering more than 50 US public green energy companies), the FTSE35 Japan Green Chip (Affiliated to Japanese companies in the environmental protection industry). These indicators generated exchange investment funds. In addition, other indicators and funds include: Deutsche Bank's db x-trackers, Standard & Poor's US Carbon Efficient Index and Barclays, iPath Global Carbon ETN.

China is a late participant in the façade. Some of the fund's products are currently listed in the Chinese market share (such as the low carbon target, the stock investment fund and the Zhonghai Fund of environmental protection of new energy), but most of them are relatively small and their investments are strictly limited to the environmental protection industry .(21).

Green bondsD.

Green bonds are bonds issued by international financial organizations and state-backed financial institutions. Due to high credit rates , Such exporting companies can raise funds at lower interest rates to support green projects. Institutions that have issued green bonds include the World Bank, the Asian Development Bank, and the Export-Import Bank of Korea. It is noted that international investment banks usually serve subscribers to these green bonds A large investor base includes institutional investors and individuals with a wealth of wealth. The average maturity of green bonds is 5-6 years. Since 2007, approximately US \$ 18 billion of green bonds have been issued internationally, mainly by international financial institutions such as the World Bank, the International Finance Corporation (IFC) and the European Investment Bank (EIB).

- * Green bonds are attractive to investors for the following reasons:
- . Green vision for investors and social value.
- •The maturity of green bonds is relatively short and liquidity is high. The most mature ones are 3-7 years old and can be easily traded in secondary markets.
- •Many green bonds are tax free, thus offering good investment returns .

E.Green banks

Green Investment Bank is a bank policy fully funded by the British government. The British government injected £ 300 million in capital into the bank and holds one seat on its board, but the bank otherwise operates independently of government control. The Green Investment Bank was created to address market failures in financing green infrastructure

projects. The British government hopes to stimulate private investment to accelerate the country's transition to a green economy. According to the annual report of the Green Investment Bank, each pound invested in the green investment bank is able to bring in private sector investments of approximately 3 pounds. (22).

The Green Investment Bank is evaluating a potential project on the robustness of its investments, leverage and green impact, with specific priorities for green commercial infrastructure projects. At least 80% of these investments will go to sectors such as offshore wind power, waste recycling, and energy recycling from waste. The green investment bank can make investments through means such as stocks, bonds and guarantees, but does not provide soft loans and investment in the project or support .(23).

F . Green insurance Green insurance is also known as environmental insurance and serves as an environmental risk management tool in a market-based economy. In general, it can be said that environmental insurance policies cover potential obligations arising from water, land or air pollution by the policyholder. The importance of this type of insurance is twofold:

First, without environmental insurance, many companies will not be able to provide compensation and restore the environment after incidental pollution occurred.

Second, mandatory insurance for specific industries will help absorb environmental costs and reduce investment activities with excessive environmental risks.

The European Union has maintained a firm stance on the "polluter pays" principle through legislation and the EU Environmental Liability Directive, which has led to the rapid development of green insurance services.

In 1990, the German government issued the Environmental Liability Act, requiring compulsory insurance from 96 sectors (as well as other things, thermal energy, mining and petroleum) across 10 major industries. As the British Insurance Association also has coordinated the launch of insurance services similar to the British insurance companies that will

only cover the cost of cleaning up when a pollution incident, as well as penalties and damages to immovable property losses, all legal expenses and medical costs.

In 2007, China began implementing leading insurance programs on environmental pollution responsibility. In January 2013, the Ministry of Environmental Protection and the CIRC issued a document on the launch of mandatory liability insurance for environmental pollution of vulnerable sectors including heavy metals, petroleum and chemical engineering, and for the first time the concept of "compulsory" was defined, yet this document remains an advisory opinion without legal effect .(24).

V. Conclusions and recommendations

A.Conclusions.

*There are many green financing options such as green financial product development, as well as risk analysis and management methodologies, and innovations by the private sector. However, wider green financing can be more easily applied through improved knowledge sharing, capacity-building, stronger policy signals and better clarity in definitions of green financing activities. In our view, these elements constitute the bulk of the "enabling environment" for green financing.

*As the United States and China play a crucial role in the world's ability to reach a climate agreement in Paris, the two countries will play a crucial role in the world's ability to meet the terms of the agreement. This requires that the United States and China not only mobilize domestic green financing - It is necessary to meet national commitments on clean energy and carbon pollution reduction, but also to use their individual public instruments for foreign investment and to help achieve the goals committed to Paris through partnership and cooperation. Green financing can be another constructive plate in the US-China climate relationship.

B.Recommendations

According to the findings of the research, the following can be suggested:

- * Provide strategic signals and frameworks for environmental and economic policies to investors with regard to the strategic framework for green investment to achieve the goals of sustainable development and the Paris Agreement.
- * G20 and local authorities can expand learning networks for knowledge-based capacity building such as the Sustainable Banking Network, investment principles, as well as other international and domestic green financing initiatives. Capacity-building platforms could be expanded to include more countries and financial institutions.
- *Supporting the development of local green bond markets through data collection, knowledge sharing and capacity building. Such support could include working with the private sector, developing guidelines for green bonds and survey requirements, and development banks can also play an important role in market development by working as investors, for example, and / or companies issuing explanatory data on green bond markets in local currencies.
- * G20 and government authorities can promote the action initiative on Green Financing Indicators and associated definitions, and to consider options for analyzing the economic and social situation and the broader implications of green financing.

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