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Banks and climate change: "the state of the art"

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ABSTRACT. – At present there is a strong call for the financial sector to assume a special role in dealing with the economics of climate change, as one of the greatest challenges to face. This is also due to the several and severe impacts the climate-related natural events have on the real economy and consequently on the financial system. In this respect, it is of utmost importance that all the financial intermediaries, banks in particular, are adequately prepared to tackle such threats: banks are therefore called to address new and detrimental risks, but also to exploit business opportunities in a context of changing climate.

WHAT IS THE INVOLVEMENT OF THE FINANCIAL SYSTEM IN THE CLIMATE CHANGE ISSUES? – "Improving climate intelligence by establishing a knowledge network of people from different backgrounds and cultures [has] the ultimate goal of reaching a greater understanding of the complex interlinkages between our planet's ecosystem and today's global financial system" (Signorini 2017). This statement may be considered a starting point to understand and explain the role that the financial system (both as a whole and in relation to its components: central banks, regulators, intermediaries, etc.) has to play in achieving the long-term sustainable development in general and the climate-resilient development in particular.

In fact, despite climate-related matters for a long time have been prerogatives of environmentalists, over the most recent years many efforts have been done to align the financial system with sustainable practices and goals. Particularly, there is a strong call for the financial sector to assume a special role in dealing with the economics of climate change, as one of the greatest challenges to face. The reasons of such relevance is specifically linked to the several and severe impacts the climate-related natural events have on the real economy and consequently on the financial system. In this respect, it is of utmost importance that the financial system is adequately prepared to tackle such threats.

It is widely-known that there is the need for decisive policy actions in the face of the extreme weather events and natural disasters occurred

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globally in the last years; this highlights the prominence of serious risks that all the countries must face in terms of likelihood and impact of such events. Certain countries, among which Italy stands out, are particularly susceptible to climate-induced stress.

All this has contributed to the increasing involvement, both at international and national level, of the financial sector in developing, researching, implementing programs to enhance the awareness of climate-related risks and the associated need to mitigate them.

Below, we report the main steps of the global cooperation about the climate change and the contribution of the financial, international and national, community in this respect.

Following the Rio Earth Summit, at the beginning of the 1990s (exactly in 1992) the adoption of the United Nations convention on climate change gave rise to the Tokyo Protocol (1997) and the Paris Agreement (2015). With reference to the latter, in December 2015, at the Conference of the Parties 21 in Paris, 195 countries for the first time meet to forge a climate change agreement, aimed to keep the increase in global average temperature to well below 2 degrees Celsius above pre-industrial levels; to pursue efforts to limit the increase to 1.5 degrees, since this would considerably reduce risks and impacts of climate change; to ensure that the global emissions peak as soon as possible (recognizing that it takes longer for developing countries) and decline thereafter in accordance with the best available science. Therefore, the Paris Agreement sets a milestone in global climate action, as it states the above-mentioned goals and at the same time aims to enhance the ability of countries to deal with the effects of climate change.

Another important step in the evolution of the international policy measures aimed to accelerate climate actions by all actors in the global economy is given by the United Nations Sustainable Development Goals (SDGs). At the United Nations Sustainable Development Summit on 25 September 2015, more than 150 world leaders adopt the 2030 Agenda for sustainable development, including the SDGs. These are designed as a continuation of the Millennium Development Goals (adopted in 2000) representing a progress of the previous goals, as they include more ambitious objectives, seeking to eliminate rather than reduce poverty, applying to all countries and all people, finally covering issues previously neglected, among which climate change. The SDGs are 17 and the thirteen is about climate actions.

Additionally, still during 2015 (December), the Financial Stability Board established the task Force on Climate-related Financial Disclosures (TCFD) to promote a more efficient and effective transparency on climate

change issues provided by companies in favour of investors, lenders, insurers and other stakeholders.

In 2016, the G20 launched the Green Finance Study Group – GFSG to promote private green investments; in 2018 it was replaced by the Sustainable Finance Study Group (SFSG) maintaining the same mandate. In December 2016, the European Commission established the High Level Expert Group on Sustainable Finance (HLEG) which published the Final Report (January 2018) representing the basis for the Action Plan for financing sustainable growth adopted by the Commission in March 2018. This Action Plan sets out an extensive strategy to connect finance and sustainability. Some of the most important key drivers of the Plan are the following: i) to establish a EU taxonomy for sustainable activities, in order to create a common language for all the actors in the financial system; ii) to establish EU labels for green financial products in order to allow investors to identify products compliant or not with green or low-carbon criteria; iii) to clarify requirements for asset managers and institutional investors regarding sustainability.

Finally, the Network of Central Banks and Supervisors for Greening the Financial System has been established (December 2017) with the goal to share experiences and best practices, promote climate risk management in the financial sector, support the transition to a sustainable economy (among others, Lautenschläger 2018).

In the global context of increasing number of measures about the climate-related matters, also at Italian level there are initiatives aimed to understand how the climate-related issues may impact on the economy and consequently on the financial system, considered as a whole and in its components. To this end the Italian Ministry of Environment, Land and Sea in 2016 established the National Dialogue on Sustainable Finance in order to promote the integration of sustainability factors across the Italian financial sector (Ministero dell'Ambiente e della Tutela del Territorio e del Mare 2016). Thereafter, at the beginning of 2018, the Ministry established the Italian Observatory on Sustainable Finance with the task of assuring the promotion, coordination and monitoring of the above mentioned integration, and at the same time encouraging the financial community to make the financial market more dynamic, innovative and attractive in terms of sustainability.

BANKS AND CLIMATE CHANGE: RISKS AGAINST OPPORTUNITIES. – The increasing interest of the international and domestic authorities in climate-related issues has led banks (more generally all the financial intermediaries) to include climate considerations into their operational and strategic

decisions. It is commonly known that climate risks may be classified into the following categories:

- *Physical risks*: connected to negative effects of climate-related events on property and economic activity (*e.g.*, trade disruption).
- *Transition risks*: financial risks tied to the transition to a low-carbon economy (as one og the goals of the Paris Agreement). As for these risks, it is important to underline their potential negative impacts on the stability of the financial system considered as a whole. In fact, during the transition (especially if not well managed) to a low-carbon economy, energy prices could increase significantly due to the fact, among others, that the alternative energy sources are more expensive. On this respect, Visco (2019) states: "Since the short-term demand for energy is not very reactive to price variations due to the fixed costs associated with changing the sources and forms of supply, a possible increase in prices would heighten the financial vulnerability of firms and households owing to the higher cost of purchasing energy goods. A sharp drop in the value of assets and infrastructures linked to the mining, transformation and use of fossil fuels (coal, oil and gas) could also trigger a rush to sell the securities of the most exposed companies and may make it more difficult for them to cover their liabilities towards the banking system and the market, with consequences that could significantly affect the economic system and financial stability".
- *Liability risks*: linked to the situation in which insured parties having suffered damage seek compensation from those they hold responsible, that are insurance intermediaries (Osservatorio italiano sulla finanza sostenibile 2019).

Physical risks are particularly crucial for banks, as they represent the exposure of both the households and firms to the climate-related events (floods, landslides, etc.): the intensity of such events may damage fixed assets of firms (property, plant and equipment) and therefore reduce their capacity to repay any loan. Such events, in other words, may adversely affect the economy in different ways. They could destroy physical capital and disrupt business, imposing the need of new financial resources for their reconstitution. At the same time, such damages and disruption could reduce the value of the collateralized assets and hence dramatically affect the lending capacity of firms and households. On this respect, among others, Faiella & Natoli (2018) find that lending to non-financial firms is negatively correlated to their flood exposure, especially in the case of small and medium enterprises. A significant contribution to this end could come from the increasing insurance coverage on properties, as a mitigation tool of certain risks (Signorini 2017).

Additionally, climate shocks may increase the levels of non performing loans of those banks that are particularly exposed to firms and households located in risk areas, with possible negative consequences in terms of credit rationing and ultimately of financial instability. Batten *et al.* (2016) report those and other impacts of a climate disaster on the financial system (Figure 1). Faiella (2019) summarizes some examples of risks related to climate events, focusing on Italian banks (Table 1).

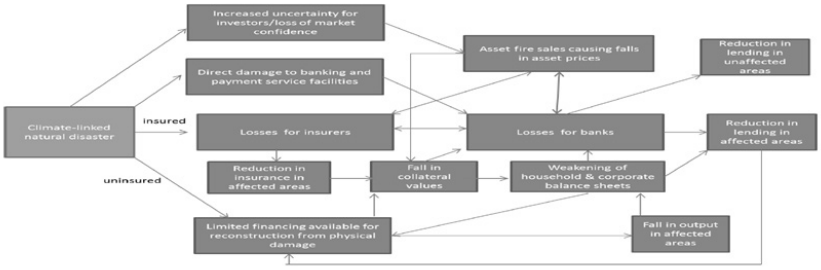

FIG. 1. Climate-related shocks and financial system (Batten *et al.* 2016).

TABLE 1. – *Climate risks (Faiella 2019).*

	Market risk	**Credit risk**
Physical risk	- Losses from a reduction in the value of assets owned by the bank and damaged by climate events - Losses from a reduction in the value of shares/bonds in the bank portfolio issued by firms whose performance is affected by climate change (*e.g.*, lower productivity, dependence from energy-water, etc…).	- Climate events affect the output of firms/households and make them more financial vulnerable, by reducing their ability to repay their debts. - Climate events affect the value of the collateral of indebted firms/households.
Transaction risk	- Losses/Profits from a reduction/increase in the value of shares/bonds/assets in the bank portfolio issued by firms whose future performance is affected by climate change policies (*e.g.*, energy intensive companies, policies to limit land use).	- Losses due to the non performing loans from firms whose future performance is affected by climate change policies.
Systemic risk	If the effects (in particular of transition risk) are affecting a whole sector (*e.g.*, constructions, agriculture, etc.) there is a risk of spillover effect across all the financial system.	

The growing importance of the risks connected with the climate events should force banks to integrate climate risks, as well as all the issues related, into their financial risk management framework, to enrich traditional approaches focused on reputational risk and to share

responsibilities and capabilities with the Corporate Social Responsibility (Salvucci & Verachi 2019).

In this sense, the recent initiative of Intesa SanPaolo is noteworthy: the Italian banking group has already included social and environmental information into the corporate rating model, in order to improve the companies credit risk assessment. This is an example of how the climate-related issues, beyond posing new and detrimental risk exposures, may motivate banks to have a proactive approach to a new challenge, and that this should also be seen as an opportunity: business opportunities may come for example from the low-carbon transition, that will require very important financing. Hence, banks' management can identify promising lending opportunities by assessing the future potential market (Colas *et al.* 2019).

REFERENCES

Batten S., Sowerbutts R., Tanaka M. (2016). Let's talk about the weather: the impact of climate change on central banks. Bank of England. Working Paper. No. 603 - May, London.

Colas J., Khaykin I., Pyanet A. (2019). Climate Change. Managing a new Financial Risk: *https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2019/feb/Oliver_Wyman_Climate_Change_Managing_a_New_Financial_Risk1.pdf*.

Faiella I. (2019). Rischi climatici e rischi finanziari. Sviluppo sostenibile, finanza e rischio climatico. *https://www.bancaditalia.it/pubblicazioni/altri-atti-convegni/2019-sviluppo-sostenibile/Faiella.pdf*.

Faiella I., Natoli F. (2018). Natural catastrophes and bank lending: the case of flood risk in Italy. Questioni di Economia e Finanza. Banca d'Italia. No 457 - October. *https://www.bancaditalia.it/pubblicazioni/qef/2018-0457/QEF_457_18.pdf*.

Lautenschläger S. (2018). Post-Basel III supervisory challenges. International Conference of Banking Supervisors – ICBS. November. *https://www.bis.org/bcbs/events/icbs20/ws4.pdf*.

Ministero dell'Ambiente e della Tutela del Territorio e del Mare (2016). Report of the Italian National Dialogue on Sustainable Finance. December.

Osservatorio italiano sulla finanza sostenibile (2019). Il rischio climatico per la finanza in Italia. *https://www.minambiente.it/sites/default/files/archivio/allegati/sviluppo_sostenibile/rapporto_wg3_rischio_climatico_finanza_italia_marzo2019.pdf*.

Salvucci F., Verachi F. (2019). Integrazione dei rischi ESG e climate change nel sistema di valutazione e gestione dei rischi. Sviluppo sostenibile, finanza e rischio climatico. *https://www.bancaditalia.it/pubblicazioni/altri-atti-convegni/2019-sviluppo-sostenibile/Intesa-Sanpaolo.pdf*.

Signorini L.F. (2017). The Financial system, environment and climate: a regulator's perspective. *https://www.bancaditalia.it/pubblicazioni/interventi-direttorio/int-dir-2017/Signorini_06.02.2017.pdf*.

Visco I. (2019). Sviluppo sostenibile e rischi climatici: il ruolo delle banche centrali. Festival dello Sviluppo Sostenibile 2019 "La finanza e i sistemi finanziari per lo sviluppo sostenibile". Alleanza Italiana per lo Sviluppo Sostenibile. *https://www.bancaditalia.it/media/notizia/festival-dello-sviluppo-sostenibile-2019-intervento-del-governatore-ignazio-visco/*.