SOME CONSIDERATIONS ABOUT CLIMATE CHANGE MITIGATION

Gabriela-Cornelia Piciu
Senior Researcher, PhD, Centre for Financial and Monetary Research "Victor Slăvescu", Bucharest, Romania

Abstract: This article addresses a very topical topic as climate change has a huge impact on the economy, health and safety, production and food security. Because climate change has been defined as a priority to achieve the goal of transforming Europe, by 2050, into a greenhouse gas neutral continent, it becomes a necessity to intensify research to improve the usefulness of the field of finance to help society to address the probably unprecedented problems related to climate change in the coming years. The article aimed to identify the main trends, opportunities and challenges in climate change, and to achieve it the following objectives were pursued: conceptual delimitations of funding for mitigating climate change and the main controversies related to them.

Keywords: climate change, conceptual boundaries, controversies, climate finance, mitigation

Introduction

The increased interest in climate finance has led to an intensification of actions to mitigate climate change globally, as well as an increased number of studies in this area in the economic literature.

There is no agreed definition of climate finance. The term "climate finance" applies to financial resources dedicated to addressing climate change by all public and private actors, from global to local scales, including international financial flows to developing countries to help them address climate change. Total climate finance includes all financial flows whose expected effect is to reduce net greenhouse gas (GHG) emissions and/or increase resilience to the impacts of current and projected climate change.

These include private and public funds, domestic and international flows and expenditures. Tracking climate finance flows faces limitations, particularly for national climate finance flows.

The concept of climate finance generally refers to the financing of activities aimed at mitigating or adapting to the impact of climate change. However, it is often confused with the related and overlapping concepts of green finance, sustainable finance and low carbon finance.

Although there is no single definition of climate finance, the United Nations Framework Convention on Climate Change (UNFCCC) Standing Committee on Finance offers an official version of this concept: "Climate finance aims to reduce emissions and increase sinks of greenhouse gases greenhouse and aims to reduce the vulnerability and maintain and increase the resilience of human and ecological systems to the negative impact of climate change".

Conceptual Boundaries

This definition of climate finance is the flow of funds to all activities, programs or projects designed to provide support in addressing climate change, both mitigation and adaptation, across all economic sectors, globally.

It is important to emphasize that this definition only includes direct financing to assets and activities and omits financial market activities such as bank loans to companies or private and public equity investments. This is to adhere to the basic principle of avoiding "double counting".

Climate finance refers to local, national or transnational funding – drawn from public, private and alternative funding sources – that aims to support mitigation and adaptation actions that will address climate change.

The term "climate finance" is also frequently associated with international agreements (the Kyoto Protocol and the Paris Agreement) on climate change. In this context, climate finance involves "new and additional financial resources" provided by developed countries to developing countries so that they can cover the full and incremental costs of climate change and decarbonisation.

The obligation to provide financial support was enshrined in Article 9 of the Paris Agreement, which calls for financial assistance from parties with more financial resources to those who are less endowed and more vulnerable. It recognizes the contribution of countries to climate change and their ability to prevent and deal with its consequences.

Climate finance is needed for mitigation because large-scale investment is needed to significantly reduce emissions. It is equally important for adaptation, as significant financial resources are needed to adapt to the negative effects and reduce the impact of climate change.

In 2022, ahead of the UN COP27 climate change conference, the Standing Committee on Finance revised the definitions of climate finance. However, differences between developed and developing countries on this issue have prevented a consensus on the documentation and methodologies to be applied to achieve the collective financial objective.

At the 28th Conference of the Parties (COP28) on climate change, Ignacio Galán, spoke about the commitment of member countries to a sustainable energy model that generates opportunities, presenting climate action as a central pillar of the sustainable development strategy.

Financing Climate Change Mitigation: A Literature Review

The first works on the interactions between climate change and the economy are those of Nordhaus (1977, 1991, 1992) and focused on their optimal mitigation.

Subsequent work has expanded the research to incorporate different aspects of climate change and its link to the economy. Fossil fuels have been found to be a critical input to production, so that economic growth increases greenhouse gas emissions that in turn induce climate change, and climate change has a negative effect on future economic activity.

However, many important aspects of the economics of climate change that are financial in nature, such as: pricing and hedging of risks arising from GHG (Greenhouse Gas) emissions, investor awareness and attitudes towards these risks and effects their influence on investment decisions are little treated in the specialized literature.

The scientific consensus is that climate change is undermining ecological systems and that mitigating it is essential to maintain the conditions for economic growth and an optimal standard of living. There is also a scientific consensus that limiting global warming requires a transformation of the structure of economic activity on a global scale.

Numerous debates took place regarding the need for global actions in the field of development, promoting the support of the balance between the three dimensions of sustainable development - economic, social and environmental. These have materialized in documents and programmatic strategies - the Sustainable Development Goals (SDGs) of the 2030 Agenda, respectively the Paris Agreement (signed by 195 countries) - an action plan to limit global warming, which aims to maintain the increase in the average global temperature below 2°C and continuing efforts to limit temperature increase to 1.5°C.

Controversies over the magnitude of climate change

Climate change continues to be a controversial topic, and sometimes scientific evidence is replaced by personal opinions and polemical discussions. We believe that every discussion about the need to mitigate climate change and global warming must be based on science.

We also believe in what Carl Edward Sagan said: Science is engendered by and dedicated to free inquiry: the idea that any hypothesis, no matter how outlandish, deserves to be examined on its own merits. Suppressing uncomfortable opinions is not the path to knowledge; it has no place in the approach of science. We do not know a priori who will discover a fundamental new understanding.

Currently, there is a growing need to analyze the controversies surrounding climate change knowledge.

A global network of over 1,800 scientists, professors, geologists, openly addressed the uncertainties and exaggerations in climate change predictions in the World Climate Declaration (WCD), addressing the following issues: Natural and anthropogenic factors cause warming - Earth's climate has varied as long as the planet has existed, with natural cold and warm phases. It is therefore not surprising that we are now experiencing a warming period.

- Warming is much slower than predicted - The world has warmed significantly less than the IPCC predicted based on modeled anthropogenic forcing. The gap between the real world and the modeled world tells us that we are far from understanding climate change.

- Climate policy is based on inadequate models - Climate models have many shortcomings and are not considered as possible global policy tools. The negative effect of greenhouse gases such as CO2 is emphasized, but the fact that enriching the atmosphere with CO2 is also beneficial is ignored.

- CO2 is plant food, the basis of all life on Earth - CO2 is not a pollutant, it is essential for life on Earth due to the process of photosynthesis. Moreover, CO2 is beneficial for nature, an additional amount in the air has promoted the growth of plant biomass worldwide. It is also good for agriculture, increasing crop yields worldwide.

- Global warming has not increased natural disasters - There is no statistical evidence that global warming increases hurricanes, floods, droughts and other natural disasters or makes them more frequent. However, there is ample evidence that CO2 mitigation measures are as harmful as they are costly.

- Climate policy must respect scientific and economic realities - There is no climate emergency. So there is no cause for alarm, just a harmful and unrealistic net zero CO2 policy proposed for 2050.

- Climate should be less political - Climate policies should be more scientific. In particular, scientists should emphasize that computer models are created by humans, theorists and programmers have introduced: assumptions, assumptions, relationships, parameterizations, stability constraints, etc.

The World Climate Declaration (WCD) brought together scientists from around the world. A follower of this is Professor Constantin Crânganu, who claims in his book "Climate changes - A (sometimes) politically incorrect guide", that the physical functions of climate changes and, consequently, local meteorological parameters change (largely) due to the influence of a variable composition of the atmosphere, controlled by dynamic random changes, including anthropogenic emissions of greenhouse gases, explosives, population growth, land use changes, aerosol pollution, etc. All these factors contribute to regional and global climate change, which overlaps and exacerbates climate change and variability caused by natural causes."

It also believes that the risks induced by climate change must be taken seriously and responsibly. Humanity will be much better off if we succeed in minimizing these risks by reducing the vulnerability of those exposed to these risks and by minimizing future changes in the composition of the atmosphere. The way in which these goals have been presented – especially through the Kyoto Protocol, the IPCC (International Panel on Climate Change) reports or recently through the Paris Climate Agreement – are not the only way to achieve and address them.

For example, it shows that due to the increase in temperature (due to the movement of the Earth), the temperature in the oceans also increases. Over time, they remove the carbon dioxide dissolved in the water and then the concentration of carbon dioxide in the air also increases. This, in turn, generates an increase in temperature through the greenhouse effect and the original effect could be amplified.

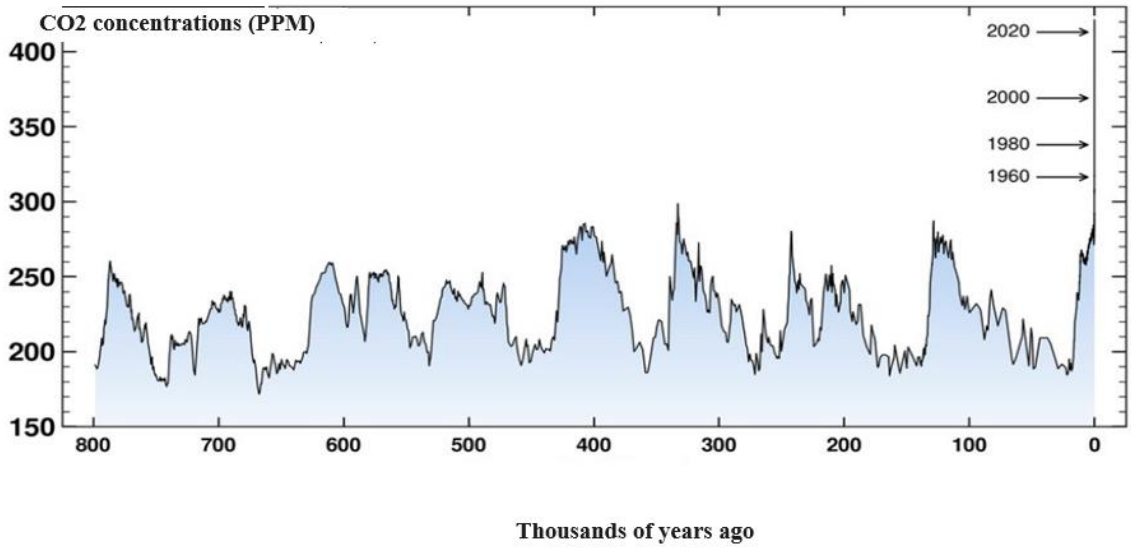
On the other hand, 97% of scientists agree that climate change is real and caused by humans, and today's increase in carbon dioxide is too great to be natural.

Starting from the following statements: the amount of carbon dioxide has almost doubled compared to the pre-industrial period - the burning of fossil fuels is to blame and carbon dioxide, even if it is in low concentrations (0.04% of the atmosphere), is the second gas that contributes , with almost a quarter of the effect, to the warming of the Earth for millions of years, the physicist Cristian Presură explains in detail some controversies related to climate change, balancing the two figures - the contribution of carbon dioxide to the normal greenhouse effect and the doubling of the amount of carbon dioxide in the industrial age. For us, the crucial question is: how much will the Earth's temperature increase due to the excess of carbon dioxide emitted into the atmosphere during the industrial period?

C. Presură shows that due to the increase in temperature (given by the movement of the Earth), the temperature in the oceans also increases. Over time, they eliminate more carbon dioxide dissolved in its waters and then the concentration of carbon dioxide in the air also increases. This, in turn, generates an increase in temperature through the greenhouse effect and the original effect could be amplified.

Today's increase in carbon dioxide is too great to be natural. For the increase in temperature, there are models and measurements that suggest that this is a consequence of the increase in carbon dioxide from the industrial period (Figure 1). On the vertical axis of the graph is the concentration of carbon dioxide, and on the horizontal axis is time, in thousands of years, starting 800,000 years ago.

Figure 1: Variations of carbon dioxide concentration



Source: US National Oceanic and Atmospheric Administration (NOAA)

It can be seen from Figure 1, the concentration of carbon dioxide has varied over time, between 200 ppm and 270 ppm, over a period of one million years, and in the last 200 years, it

has increased suddenly, exceeding 400 ppm. The increase is sudden, almost instantaneous on this scale of hundreds of thousands of years, and the line is almost vertical.

Conclusions

It can be said that a sudden increase in carbon dioxide in the last 200 years is the consequence of human activities. The vertical line - the sudden growth - cannot be based only on natural causes, and if it were, why would it appear just now, when human civilization has an equally sudden technological growth on the scale of geological time?

It is stated as a result of the research undertaken, that: "the concentration of carbon dioxide in the atmosphere has almost doubled, throughout the industrial era, through the burning of fossil fuels and establishes the role of carbon dioxide in warming the Earth - it acts as the "quilt of the Earth" to be even thicker. Because of this, the Earth receives, in addition, 3 Watts of energy per square meter, that is, approximately one percent of the energy from the Sun".

The persistent search for consensus on the objectives and instruments for implementing climate policies continues to provoke vigorous arguments, pro and con, without doing much to resolve the most pressing questions that exist today. On the contrary, it distracts from the important practical challenges that highlight the need to negotiate between different scales of concern and action, rather than framing them in a linear relationship between scientific consensus and political action.

BIBLIOGRAPHY

- Addoum, J. M., D. Ng, and A. Ortiz-Bobea, forthcoming. “Temperature Shocks and Earnings News,” Review of Financial Studies.
- Aghion, P., R. Veugelers, and D. Hemous. 2009. “No Green Growth Without Innovation,” Policy Briefs, Bruegel.
- Aglietta, M., E. Espagne, and B. Perrissin Fabert, 2015. “A proposal to finance low-carbon investment in Europe,” La Note D’Analyse No. 4, France Stratégie, Paris
- Auffhammer, M., 2018. “Quantifying Economic Damages from Climate Change,” Journal of Economic Perspectives 32(4):33–52.
- Burke M., S. M. Hsiang, and E. Miguel, 2015. “Global Non-linear Effect of Temperature onEconomic Production,” Nature 527:235–39.
- Hsiang, S., and R. Kopp, 2018. “An Economist’s Guide to Climate Change Science,” Journal of Economic Perspectives 32(4):3–32
- Klenert, D., L. Mattauch, E. Combet, O. Edenhofer, C. Hepburn, R. Rafaty, and N. H. Stern, 2018. “Making carbon pricing work for citizens,” Nature Climate Change 8:669–677.
- Sachs, J., 2015. “Climate Change and Intergenerational Well-Being,” in Oxford Handbook of the Macroeconomics of Global Warming, L. Bernard and W. Semmler (eds.), Oxford University Press, Oxford.
- Weitzman, M. L., 2009. “On Modeling and Interpreting the Economics of Catastrophic Climate Change,” Review of Economics and Statistics 91(1):1-19
- ***European Commission (2021) - Proposal for a Regulation of the European Parliament and of the Council establishing the framework for achieving climate neutrality https://eur-lex.europa.eu/legal- content/RO/TXT/?uri=CELEX:52020PC0080
- ***European Commission (2021) - European Climate Law https://ec.europa.eu/clima/eu-action/european-green-deal/european-climate-law_ro
- ***European Commission (2021) - EU Adaptation Strategy (https://ec.europa.eu/clima/policies/adaptation/what_en).

- ***European Environment Agency (2021) - Sustainability transitions - Towards a global sustainability
- ***Eurostat, Glossary:Carbon dioxide emissions https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Carbon_dioxide_emissions