



## Green finance: can it help combat climate change?

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### The economics of climate change

"Greenhouse gas (GHG) emissions are externalities and represent the biggest market failure the world has seen".<sup>2</sup> A comprehensive and illuminating departure point for understanding the economics of climate change is the 2007 Stern Review.<sup>3</sup> Our past and present production and consumption patterns have emitted excessive greenhouse gases (GHGs), especially carbon dioxide, whose accumulated concentration above critical thresholds<sup>4</sup> in the atmosphere affects global average temperatures, causing what is known as "global warming" or "climate change" (CC). That, in turn, affects our entire socioeconomic system through complex channels. All this can have severe consequences for global sociopolitical-economic equilibria: standards of living, productivity, refugees and massive migration, etc. And all this involves the ingredients that make collective rational decisions difficult: considerable uncertainty, large time lags before becoming apparent (especially to CC sceptics), free riding and collective action problems. That is because while CC is global, its origins are local (the tragedy of the commons), and its effects will be felt only after our generation's lives (the tragedy of the horizon<sup>5</sup>). The effects are most likely irreversible, but the science must address significant layers of uncertainty. Therefore, we are dealing with a subject that mixes uncertainty, risk, prioritising ethical choices and international coordination for the common good.

The best science today recommends stabilising the stock of GHGs below a certain target and thus acting to control and reduce new flows or emissions now in order to avoid causing irreversible damage beyond 2050. The mitigating measures naturally have a cost of abatement. Changes have to occur in production and consumption habits, and not just the obvious candidates like transportation and energy. For the sceptics that prefer a "wait and see" approach, a pure self-interested risk management strategy recommends buying the proper insurance as a kind of "pari Pascalien",<sup>6</sup> ie hedging against such a systemic global risk even if it has a small probability. There are many options for abatement, ranging from improving our current energy efficiency, to changing our energy matrix to renewable sources, to tackling non-energy emissions/damages in agriculture and deforestation. Ironically, in some options, benefits exceed costs and might create a new, virtuous, low carbon growth cycle. New technology is fundamental to reduce risk and lower abatement costs (we will come back to that later).

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<sup>2</sup> N Stern, "The economics of climate change", *American Economic Review*, vol 98, no 2, 2008, pp 1–37.

<sup>3</sup> N Stern, *The Stern Review*, Cambridge, 2007.

<sup>4</sup> Beyond our ecosystem's absorptive and recycling capabilities.

<sup>5</sup> See M Carney, "Breaking the tragedy of the horizon – climate change and financial stability", speech at Lloyd's of London, September 2015.

<sup>6</sup> The French philosopher, mathematician and physicist Blaise Pascal (1623–62) used a game theory argument to justify faith as a "hedge": rational people should believe in God as a "pari" or bet. They would incur small losses of pleasure (accepting to live a life without excessive pleasures) if God exists, which would be more than offset by infinite gains (eternity in heaven).



However, as of now and facing uncertainty, any good policy to combat CC requires a “price” to act as an incentive to reduce a negative externality such as GHGs, in line with basic welfare economics. The price needs to reflect what we already know about the medium- to long-term additional costs of CC. In theory, such a “shadow price” incorporating the social cost of carbon (SCC) would be enough to reduce emissions in a perfect Walrasian world and should be used in economic and financial calculations, in particular in the cost-benefit analysis of investment projects, to take into account these negative externalities (eg congestion, pollution, toxic emissions). But the “right price of carbon” is a tricky issue;<sup>7</sup> we need to be pragmatic and use various metrics to reach emission targets, calculating abatement costs while incorporating all the available information on new technologies that reduce them.

## The political economy of climate change

The political economy of CC is about who will pay for what, and when and how to share the burden of abatement costs. It boils down to how CC negative externalities can be priced and incorporated into practical decision-making processes in a way that is sustainable from a sociopolitical viewpoint. If we want to limit environmental risk, there is a maximum amount of emissions permissible before our ecosystem’s threshold is exceeded. Limiting emissions raises obvious issues of fairness in burden sharing. The political economy issues related to CC risks arise from misperceptions of a stock-flow problem. Our atmosphere is a stock, a finite common good that has been depleted/consumed throughout a known history of industrial development with flows of emissions of GHGs. Historically, advanced economies’ emissions flows were responsible for a larger share of the depletion/consumption of the stock. They are now enjoying a higher standard of living but the remaining absorptive capacity of the stock (the atmosphere) allows limited new flows of emissions of GHGs. Thus, how should we respond to the claims of developing countries for rights to emissions since they are now beginning to industrialize and thus are increasingly responsible for the new flows? Now that the finite common good is much smaller, how to limit emissions of rich and poor while maintaining a sense of justice (more on that later)?

How can we incentivise limits and controls for everyone? First, there is the classical way of dealing with externalities through general Pigovian<sup>8</sup> taxes and subsidies. Then there is the possibility of trading emission rights through market mechanisms and auctions. Third, one can use an implicit pricing through regulations and standards that incentivises shifts towards new, less carbon-intensive technologies. Finally, there could also be implicit pricing through reputation and exposure, by creating processes for disclosing climate-related financial assets and financed projects.<sup>9</sup>

We are dealing with a very large, potentially irreversible, negative externality with significant distributional effects across social groups and both rich and poor countries. The textbook first best solution is to use taxes and subsidies, but such a direct and transparent treatment might create political economy difficulties and, if so, delay decisions and create inertia. Therefore, a pragmatic second best solution is to use a combination of instruments that are equivalent to implicit pricing, ranging from taxes and subsidies,

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<sup>7</sup> The Stern Review and technical modelling using work by the Nobel-Prize winning Intergovernmental Panel on Climate Change (IPCC) suggest that we need to limit the concentration of GHGs in our atmosphere to 550 parts per million (ppm) CO<sub>2</sub> equivalent (CO<sub>2</sub>e). That means emission cuts of 20 gigatonnes of CO<sub>2</sub>e by 2030 and thus a CO<sub>2</sub> price of about 30 euros per tonne. Moreover, an SCC also implies sensitive assumptions about models, the social utility of consumption, fairness in burden-sharing, social discount rates, etc. What is key is that we end up with an abatement cost of about 1% of world GDP, which seems to be a reasonable insurance cost.

<sup>8</sup> From Arthur C Pigou, who proposed the concept and the solution to externality problems by taxation, an idea that is key to modern welfare economics and to economic analysis of environmental impacts.

<sup>9</sup> In response to the G20, the Financial Stability Board (FSB) established a private sector, industry-led Task Force on Climate-related Financial Disclosures to develop voluntary, consistent, climate-related financial disclosures for use by companies in providing information to investors, lenders and insurance underwriters. The FSB delivered the Task Force final report “Recommendations of the Task Force Climate-related Financial Disclosures” in July 2017 at the G20 Hamburg Summit. <http://www.fsb.org/what-we-do/policy-development/additional-policy-areas/developing-climate-related-financial-disclosures/>



to carbon pricing and trading, environmental standards and regulations, and information and awareness, etc with the involvement of all agents in the economy and across several sectors.

## The financial sector, central banks and climate change

Implicit pricing through indirect interventions is a delicate balancing act. For example, how can the financial sector look at CC? As the single biggest negative externality of modern times, CC entails considerable risks. We need to act now given the implications for financial stability and future generations. But how can you correct distortions using the financial sector without inadvertently creating other types of distortions? How fast can you change the incentives for financial market participants and make them adjust credit and portfolio decisions accordingly? Can you and should you use credit allocation, subsidised interest rates, etc and at the same time avoid a misperception about fairness in bearing costs? There are many experiments, especially in emerging market economies (EMEs) where such subsidised credit created other macroeconomic problems. To be fair, there are also instances where it also allowed productivity-enhancing investment and growth. At any rate, it is a complex discussion that needs to take into account governance structure, availability of instruments and the existing set of immediate risks.

Moreover, some are advocating a special role for central banks and financial regulators,<sup>10</sup> suggesting direct involvement using a wide range of instruments: climate change-related disclosures, regulatory incentives such as differentiated capital requirements, and even “green” quantitative easing (QE). Could direct central bank intervention targeting “green finance” products influence returns on green finance and be a new instrument for changing the climate course? Indeed, the emergency situation of the Global Financial Crisis (GFC) extended the role of central banks. But can “new” and even more unconventional monetary policies go further in the direction of favouring green financial instruments without creating other problems?

Changes in mandates and institutional arrangements are also very complex issues because they deal with sociopolitical equilibria, reputation and credibility. We observed that during the GFC. There is a danger of overstressing the role and mandates of central banks and financial regulators to areas where political economy problems signal that society has yet to settle debates. Naturally, having institutions of last resort to solve crises is useful, but they cannot be a substitute for a thorough discussion about fundamental issues such as CC, most likely the “mother of all structural reforms” that will require changes in deep-rooted habits of consumption and production. There is a role for public institutions, including central banks, to guide and lead by example but perhaps not to bypass, replace or over-stretch the necessary debates in civil society. Nevertheless, it is important that the financial sector use its pivotal position to raise awareness, including through its own pricing of risk and reputation. Finally, an active but transparent role by public entities to finance innovation and R&D to promote investment that limit/mitigate CC is also paramount.

The challenge will be to understand the risks and opportunities that these new policy questions bring to all of us – policymakers, the industry and society – ranging from the possible smart financing of climate change innovation, on the one hand, to increasing moral hazard, on the other.

## Climate change and the financial sector: five practical steps and the way forward

Even without instruments such as “green QE”, central banks and financial regulators can certainly think of practical, market-oriented ways for the financial sector to increase the flow of instruments that could meet the investment requirements of asset holders.

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<sup>10</sup> See United Nations Environment Programme, “On the role of central banks in enhancing green financing”, *Inquiry Working Paper* 17/01, February 2017.



First, in practice, there is a need to map and identify the possible CC-related risks for the financial sector. That implies quantifying the impact on insurance liabilities and on the value of financial assets that may arise from losses related to climate change (flooding, storms, etc). That might also imply assessing potential litigation costs from losses or damages due to the effects of CC. As we suspect, if perceptions of such large liabilities arise, it might entail an asset repricing. Hence, it could impact financial stability locally and globally. One way forward, as suggested by the FSB, is to disclose CC-related information, governance practices and *“moving climate-related issues into mainstream annual financial filings (...). Improved practices and techniques, including data analytics, should further improve the quality of climate-related financial disclosures and, ultimately, support more appropriate pricing of risks and allocation of capital in the global economy”*.<sup>11</sup>

Second, the financial sector can contribute to fund private sector investment in CC-related new technologies that is likely to bring economic and financial upsides. There are foreseeable benefits from adjusting to an economy with a smaller carbon footprint, where new policies and technology could cause a positive re-evaluation of a large range of asset classes. More generally, as green energy producers become growing sectors, there are plentiful business opportunities associated with rising income and employment as substitutes for the traditional “brown economy” (eg fossil fuels, coal, etc). Some technologies will become efficient and commercially viable/profitable. From that point, there could be some significant positive valuation effects for classes of assets and the real producers and financial intermediaries linked to these new technologies. Therefore, there needs to be financial and analytical support to construct new indices and work on practical initiatives such as the ones envisaged in the forthcoming sessions of this conference.

Third, there is a need to support the growth and consistent universal standards for label recognition of green finance, a reflexion that we have been doing at the BIS.<sup>12</sup> In that regard, green bonds are bonds that must be aligned with the four core components of the International Capital Market Association’s Green Bond Principles (GBP) and where the proceeds will be exclusively applied to financing eligible green projects, aiming to address CC, natural resource depletion, biodiversity conservation and/or pollution. The first green bond, the so-called “Climate Awareness Bond”, was issued 10 years ago, in June 2007, by the European Investment Bank. The largest issuers of green bonds are supranational and state agency issuers. This year to date, a total of USD 35 billion in green bonds have been issued. While the total amount of outstanding green bonds has reached around USD 200 billion, they still account for only a very small proportion of financial flows (0.2% of the total number of bonds outstanding, ie USD 100 trillion). Among green bond investors, four major types of institutional investors may be identified. First are pure green investors, which are investors with green investing mandates, offering green bond funds. Second are socially responsible investors, who are investors with established socially responsible mandates, but who are not necessarily required to buy bonds designated as green. The third group are asset managers that report a positive impact on franchise value for green investments. Finally, investors classified as banks/corporate/insurance, the treasuries of which move towards socially responsible investing.

Fourth, with this type of green finance funding, there is a greater chance of accelerating research on new technologies and creating synergies to ignite a new business cycle and the win-win situation mentioned above. Reigniting growth through investment in low carbon technologies is most likely more sustainable from a macroeconomic and environmental perspective than any of the previous consumption-led and household debt-based recoveries.<sup>13</sup> This new business cycle would be most welcome. If it begins

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<sup>11</sup> Financial Stability Board (FSB), op cit, p v.

<sup>12</sup> See T Ehlers and F Packer, “Green bonds – certification, shades of green and environmental risks”, contribution to the G20 Green Finance Study Group, BIS note, August 2016.

<sup>13</sup> See L Pereira da Silva, “Rethinking development finance: towards a new ‘possible trinity’ for growth?”, remarks at the Atlantic Dialogues 2016, Marrakesh, December 2016, [www.bis.org/speeches/sp170221.htm](http://www.bis.org/speeches/sp170221.htm).



to take shape, supported by green financing sources at the very moment where the post-GFC recovery strengthens in advanced economies, it would be an important supportive element for the post-GFC policy normalisation.

Finally, fifth, last but not least, CC requires international cooperation, as it is a unique global problem. There has been uneven progress so far in mitigating CC. Collective action and stated commitments have flourished in multilateral conferences and internationally agreed commitments such as the COP21<sup>14</sup>. But it seems that we are still not on the right path to significantly reduce our GHG emissions, even if there are some small signs of improvement.<sup>15</sup> However, recently global debates have been dominated by a reaction against multilateralism, international cooperation and coordination. New recent sociopolitical developments favour populist, national responses, protectionism and a simplistic view of globalisation as a scapegoat<sup>16</sup> for all problems such as within-country income inequality to job losses and global financial crises and despite globalisation's recognised contribution to a substantial rise in living standards and falling poverty over the past half-century. This mindset obviously does not favour the efforts to combat CC as it delays collective action and reneges on some advanced economies accepting binding and challenging targets. However, and paradoxically, it has also triggered a wake-up call in many local communities that are committed more than ever to achieving their own objectives and working for the global common good.

As mentioned earlier, developing countries need to see that their support for action combating CC needs to take into account their lower stage of industrialization. Thus, CC actions require international cooperation between advanced and developing countries and the recognition of the need for technology transfers and increases in official development assistance to developing countries.

On balance, this might create more support and trigger the necessary impulse through debate. *"It is intensive public discussion that will [...] be the ultimate enforcement mechanism"*.<sup>17</sup> For us in the financial sector, this is certainly a contribution that we can make. Thus, the answer to the question of whether green finance can help combat climate change is yes. The financial sector can play a positive role: mapping and identifying CC-related risks; strengthening the process of labelling green finance instruments in a rigorous and credible way; fostering private sector investment in CC-related new technologies; accelerating research on new technologies and creating synergies to ignite a new business cycle; helping to engineer a virtuous new less carbon-intensive growth cycle; and being respectful of the challenges of international cooperation. These are a few among many elements that the BIS had in mind when accepting to co-organise this event with OMFIF, the Deutsche Bundesbank and the World Bank.

To conclude, we are today in Frankfurt, the city of one of the most remarkable schools of social theory and philosophy that encouraged combining the best in social sciences (economics, history, sociology, psychoanalysis, existential philosophy) to think about the possibility of an alternative path to social development, trying to avoid dogmatism/determinism and always promoting its "critical" and ethical components. There could be no better inspiration for our conference today.

Thank you very much.

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<sup>14</sup> The 2015 COP 21 United Nations Climate Change Conference, held in Paris from 30 November to 12 December 2015, following the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the Conference of the Parties following the 1997 Kyoto Protocol.

<sup>15</sup> The United Nations Environment Programme, *The emissions gap report 2016*, November 2016, notes that "GHG emissions continue to grow, and while the indications are encouraging that the growth rate of global CO<sub>2</sub> emissions from fossil fuel use and industry is slowing, it is still too early to say whether this is likely to be permanent."

<sup>16</sup> Bank for International Settlements, *87th Annual Report*, June 2017, Chapter VI, [www.bis.org/publ/arpdf/ar2017e6.htm](http://www.bis.org/publ/arpdf/ar2017e6.htm).

<sup>17</sup> See N Stern (2008), *op cit*, p 33.