‘Financing the Future’
Presentation of Italy’s ‘National Dialogue On Sustainable Finance’ report

The Financial system, environment and climate: a regulator’s perspective

Welcome address by the Deputy Governor of the Bank of Italy

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Rome, 6 February 2017

Good morning ladies and gentlemen. I am delighted to welcome you all here to the Bank of Italy in Rome for today's presentation of Italy's 'National Dialogue On Sustainable Finance' report.

Environmental issues, and climate change in particular, are among the greatest challenges that we face. The *Global Risks Report 2017* published by the World Economic Forum lists extreme weather events, major natural disasters and the failure of climate change mitigation and adaptation among 'the most prominent global risks' and warns that climate change 'ranks among the highest' risks in terms of likelihood and impact.[1] The evidence tells us that the world is warming, that this trend is clear and primarily the result of human activities,[2] and that extreme weather events such as heat-waves, heavy rainfall and floods are increasing in frequency and intensity because of this warming.[3] Globally, 2015 has been the warmest year since 1880: since 1986 the global temperature anomaly has been consistently positive and the years after 2000 are the warmest of the time series.

Italy is no exception. The average temperature in 2015 was the highest since 1961.[4] Climate change can exacerbate the natural fragility of our country. With its unique geological and geomorphological characteristics, Italy is particularly susceptible to hydrogeological instability and the impact of weather and climate factors are often amplified by human activities.[5]

But why should financial regulators, who are not environmental watchdogs, care about these issues? Because the effects of climate-related natural events (as well as an abrupt transition to a low-carbon economy) have potentially far-reaching consequences for the economy and the financial system.[6]

This issue is already on the agenda of international financial regulators.

In September 2015 the Financial Stability Board (FSB) held a public-private sector meeting to consider the implications of climate-related issues for financial stability. The discussion identified three types of risk: **physical risk**, deriving from direct damage to property or trade disruption; **liability risk**, which could arise if parties that have suffered damage seek compensation from those they hold responsible; **transition risk**, the financial risks arising from the transition to a low-carbon economy.

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[1] World Economic Forum, *Global Risks Report 2017*. The report surveyed some 750 experts on the perceived impact and likelihood of 30 prevalent global risks as well as 13 underlying trends that could amplify them or alter the interconnections between them over a 10-year timeframe.

[2] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014 Synthesis Report Summary for Policymakers*. See, in particular, p. 2 of the report: 'Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history'.

[3] L. Alfieri et al. (2015), 'Global warming increases the frequency of river floods in Europe', Hydrol. Earth Syst. Sci., No. 19, pp. 2247–2260.

[4] ISPRA (2016), *Gli indicatori del clima in Italia*.

[5] ISPRA (2015), *Dissesto idrogeologico in Italia: pericolosità e indicatori di rischio - Rapporto 2015*.

[6] The material effects of climate-related events can affect the long-term growth rate of the economy and a central bank that does not properly take these effects into account could misjudge developments in the output gap and inflationary pressures. See Batten S., Sowerbutts R., and M. Tanaka (2016), 'Let's talk about the weather: the impact of climate change on central banks', Bank of England, Staff Working Paper No. 603.

One example of the importance of **physical risk** is the exposure of households and businesses to hydrogeological risk, such as floods and landslides. Between 2009 and 2011 in Italy there was an average of 82 events each year, affecting more than 2.3 million people, with estimated economic damages of approximately €2.7 billion per year.[7] According to the most recent data, 15.2 per cent of the population and 18.3 per cent of local businesses are exposed to flooding risk; 3.2 and 3.4 per cent respectively, are located in areas classified as 'very high hazard'.[8]

These events can impact the economy in various ways, by destroying physical capital (dwellings, plants, infrastructures), and by forcing households, businesses and local and central governments to use financial resources to rebuild. A back-of-the-envelope calculation put the costs of the 2015 floods at €3.1 billion.[9] Most of this financial loss was uninsured.

Aside from damaging the economic activities of businesses and households, floods and landslides also reduce the collateral value of bank loans as a result of the material damage to the collateralized assets and, in turn, influence borrowing and lending propensities.[10]

An ongoing study at the Bank of Italy investigates how hydrogeological risk can spread to the banking sector.[11] Preliminary econometric evidence shows that a reduction in flooding risk is associated with an increase in outstanding loans to small and medium-sized enterprises.

Physical risk can be mitigated both by prevention and risk-reduction measures, such as the climate proofing of buildings and infrastructures, and/or by increasing insurance coverage on properties. The two may reinforce each other. Parallels can be drawn with earthquake risk, another constant concern in this country in terms of physical and human risk. Although one third of Italy's population lives in seismic areas, the insurance industry association estimates that less than 1 per cent of dwellings have private earthquake coverage. In a recent Parliament testimony on public finance I suggested that one way of mitigating these risks would be to promote insurance to protect households and enterprises and provide incentives to reduce physical risks.[12] Given the nature of catastrophic risks, such a scheme would require some form of interaction between the public and private sector.[13] The experiences of other countries can help.[14]

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[7] Faiella I. (2013), 'Uso sostenibile del suolo in Italia: analisi e proposte', conference paper, *Calamità idrogeologiche: aspetti economici* - Accademia dei Lincei, Rome.

[8] Flooding risk levels are based on the estimated frequency and damage of an event over a long time horizon: in the high-risk scenario floods occur on average once in 20-50 years.

[9] Ispra (2016), *Annuario dei dati ambientali 2016*, Table 1: General traits of flood events.

[10] A US study finds that when local credit demand increases after natural disasters, credit in unaffected but connected markets declines to compensate for the additional lending in affected areas. Cortés K. and P.E. Strahan (2015), 'Tracing Out Capital Flows: How Financially Integrated Banks Respond to Natural Disasters', Federal Reserve Bank of Cleveland, Working Paper No. 14-12R.

[11] Faiella I. and F. Natoli (2017), 'Catastrophe risk and bank lending', Bank of Italy, mimeo.

[12] Signorini F. (2016), 'Audizione preliminare all'esame della manovra economica per il triennio 2017-19', November 2016.

[13] For private insurers it is hard to cover events that can have extensive consequences or that are correlated. This can be solved if they join forces with the public: the public commits to sharing part of the losses while they are in charge of pricing, selling, and administering policies. Molk P. (2016), 'The Government's Role in Climate Change Insurance', *Boston College Environmental Affairs Law Review*, Vol. 43, No. 2, pp. 411-426.

[14] In the United Kingdom, the insurance industry and the government have established a reinsurance mechanism (Flood Re) that enables insurers to offer affordable insurance to households facing higher levels of flood risk. Its operations are funded through a levy collected from UK insurers. In the US the communities that adopt measures to reduce flood risk

With the Paris Agreement the international community committed to stabilizing the atmospheric concentration of greenhouse gases, holding the increase in the global average temperature to well below 2°C above pre-industrial levels. This 'carbon budget'[15] will influence the fraction, or the rate at which, fossil fuel reserves can be extracted and used;[16] this in turn will affect the value of proven reserves and fossil-fuel-related infrastructures.

The critical situation of the coal business – coal is the most carbon-intensive fossil fuel – illustrates this point very clearly.[17] A substantial portion of the assets in the global coal industry are held by companies that are either in bankruptcy proceedings (in the US, companies producing nearly half of the country's coal are currently under bankruptcy protection)[18] or are financially distressed.[19] Any further drop in the value of energy reserves and related infrastructures would negatively impact energy company profitability and value, raising concerns in financial markets.[20]

Climate policies such as carbon pricing systems (a carbon tax on energy products or a cap-and-trade system) or renewables subsidies charged to consumers in energy bills, involve difficult tradeoffs as they will impact production and consumer prices. Because energy demand is inelastic, at least in the short-to-medium term,[21] a steep rise in energy prices can increase the financial vulnerability of businesses and households.

Improving the assessment of long-term environmental risk is therefore important and, in order to avoid being caught by the 'tragedy of the horizon',[22] we shouldn't underestimate it. Markets are probably underpricing climate-related risk because they think that its effects will materialize only in the long term. The 2007 financial crisis reminds us of the economic and social costs of underestimating and underpricing risk.

One way of assessing climate risk accurately may be to develop climate intelligence. This means increasing the availability of data on the carbon intensity of industries and on the exposure of financial institutions to

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can participate in the National Flood Insurance Program (NFIP), a federal scheme that makes flood insurance available to the communities' members.
For seismic insurance public-private partnership schemes exists in New Zealand, Japan, California and Turkey (http://www.ania.it/export/sites/default/it/pubblicazioni/monografie-e-interventi/Danni/Terremoto-come-si-assicurano-i-paesi-piu-a-rischio-27.08.16.pdf).

[15] Under the current trend in global emissions, the carbon budget will be exhausted before 2040, and greenhouse gases concentration will rise to a level compatible with global warming of at least 3.5°C.

[16] McGlade C and P. Ekins (2014), ''Un-burnable oil: An examination of oil resource utilisation in a decarbonised energy system', Energy Policy, No. 64, 102–112.

[17] World demand for coal fell in 2015 for the first time since the late 1990s and this is mainly the effect of an increased share of gas and renewables in the power mix determined by a combination of costs reduction and stricter environmental regulations. In a 2-degree scenario the share of coal in the global power mix would drop to 35 per cent in 2040 (from 61 per cent in 2014). See IEA (2016), *World Energy Outlook*, Chapter 5.

[18] IEA (2016), *ibidem*.

[19] Fickling D. (2016), 'Coal's Stranded Assets', https://www.bloomberg.com/gadfly/articles/2016-05-10/coal-s-stranded-assets.

[20] In 2014 the outstanding debt of the oil and gas sector amounted to roughly $2.5 trillion, up from $1 trillion in 2006. "Domanski, D., Kearns, J. Lombardi, M., and H. Song Shin (2015), 'Oil and Debt', BIS Quarterly Review, March.

[21] This is as true for electricity and heating as it is for liquid fuels. Schulte and Heindle find that in Germany own price elasticity is −0.43 for electricity and −0.50 for space heating. For Italy Faiella and Cingano estimate that the average elasticity for liquid fuels households' demand is -0.56. Schulte I. and Peter Heindl P. (2017),'Price and income elasticities of residential energy demand in Germany', *Energy Policy*, Vol. 102, pp. 512-528; Faiella I. and F. Cingano (2015), 'La tassazione verde in Italia: l'analisi di una carbon tax sui trasporti', *Economia Pubblica*, No. 2, pp. 45-90.

[22] Carney M. (2015), 'Breaking the tragedy of the horizon - climate change and financial stability', http://www.bankofengland.co.uk/publications/Documents/speeches/2015/speech844.pdf.

carbon intensive industries, and developing conceptual frameworks in order to process this information in connection with economic and financial models.[23]

An important step in this direction was the FSB's decision to establish a Task Force on Climate-related Financial Disclosures (TCFD), an industry-led group that has the objective of promoting effective financial disclosure of climate-related risk. The TCFD has recently released the draft of its final report, which contains many interesting suggestions on disclosure steps and an innovative (but challenging) use of '2°C' scenarios to assess the risks and opportunities arising from climate change and climate policies.

I believe that the 'National Dialogue on Sustainable Finance' can be regarded as another important step toward improving climate intelligence by establishing a knowledge network of people from different backgrounds and cultures with the ultimate goal of reaching a greater understanding of the complex interlinkages between our planet's ecosystem and today's global financial system. On behalf of the Bank of Italy let me welcome you to the presentation of this report. I look forward to what will undoubtedly be a lively and productive debate.

[23] Some authors are using 'Climate value-at-risk' models to assess the extent of transition risk. See Dietz S., Bowen A., Dixon C. and P. Gradwell (2016), "'Climate value at risk' of global financial assets", *Nature Climate Change*, No. 6, pp. 676–679.

Designed and printed
by the Printing and Publishing Division of the Bank of Italy