SPEECH

“Know thyself” – avoiding policy mistakes in light of the prevailing climate science

Keynote speech by Frank Elderson, Member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the ECB, at the Delphi Economic Forum IX

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For centuries the oracle of Delphi guided those seeking advice on what the future might hold.[1] Perhaps the most famous prophecy originating here from the Temple of Apollo is the one delivered during the Ancient Greek era to Croesus, the King of Lydia. When he consulted the oracle about going to war with Persia, he was told that if he were to attack, “a great empire would fall”. Emboldened by this apparent foresight, King Croesus went to war. And an empire did indeed fall. But it was the Lydians, not the Persians, who were defeated. The oracle was right. Yet King Croesus had overlooked the considerable room for interpretation that the prophecy allowed, with significant implications for his assessment of the outlook and the consequences of his decisions.

Today, policymakers count not on prophecies and oracles but on facts and science when assessing the outlook so they can make informed decisions. But while facts and science leave far less room for interpretation and uncertainty than ancient prophecies, they cannot eliminate it entirely. The scientific method requires established knowledge to be scrutinised and reviewed, especially – though certainly not exclusively – knowledge that pushes the boundaries of modern science. So science-based models that are used to describe what happens in the real world need to be updated regularly, in terms of both their structure and their parameters. And we have to acknowledge that these models are subject to uncertainty, including statistical, measurement and policy uncertainty. These caveats are relevant whenever we use these models to describe what has happened in the past, and they are especially relevant when assessing how present day knowledge is used to project an outlook for the future.

At the same time, policy must remain robust in the face of this uncertainty and build on what is scientifically established. Policymakers need to identify and spell out those questions that, if resolved, would reduce uncertainty and increase the level of confidence with which decisions are taken.

Today I will discuss how the prevailing evidence from climate and nature science can inform the actions of public authorities, even those that are not responsible for climate and nature policy, such as central banks and supervisors.[2] These public authorities – just like companies and individuals – are increasingly taking decisions whose outcomes will be subject to the tangible consequences of the ongoing climate and nature crises. In fact, in a ground-breaking ruling earlier this week, the European Court of Human Rights,

explicitly referring to “the compelling scientific advice provided, in particular, by the Intergovernmental Panel on Climate Change”, established that States “need to put in place the necessary regulations and measures aimed at preventing an increase in greenhouse gas concentrations in the Earth’s atmosphere and a rise in global average temperature beyond levels capable of producing serious and irreversible adverse effects on human rights”.[3] So how can we ensure that decisions taken today reflect what we know about climate science while remaining robust in the face of uncertainty?

Fundamental challenges of failing to meet the goals of the Paris Agreement

Currently, the best assessment by climate scientists tells us that the world is not on a path to limit the increase in the average global temperature to 1.5 degrees Celsius above pre-industrial levels – the overarching goal of the Paris Agreement. We are not even on course to limit the increase to 2 degrees. In fact, last November the UN Emissions Gap Report concluded that the world is on track for an average increase of 2.9 degrees, and even that will only be achieved if all government commitments to mitigation measures are implemented.[4] In other words, without a full and prompt implementation of these commitments, we will see an increase of even more than 2.9 degrees. In any case – acknowledging the uncertainty – the world is currently heading for a temperature rise far above the Paris Agreement goals.

This raises a number of critical challenges for maintaining wellbeing as we know it. These go far beyond the economic challenges that may emerge and will be particularly relevant for central banks and supervisors. In a recent report, the European Environment Agency sent a dire message about climate risks, pointing out that “several climate risks have already reached critical levels” and observing that “[i]f decisive action is not taken now, most climate risks could reach critical or catastrophic levels by the end of this century”.[5] Global heating will have an impact on food, water and energy security and the health of the general population, and these effects will be aggravated by ecosystem degradation, which is itself worsened by global heating. Moreover, increasing climate and natural hazards can disrupt critical infrastructure, putting people’s livelihoods and even their basic needs at risk.

There may also be second-round effects that compound the direct impact of an increase in climate and natural hazards. One example of this would be changes in migration flows, which like other such second-round effects are generally not yet accounted for in models of the impact of climate change and nature degradation. But the more severe the climate scenario, the more likely it is that these flows will increase, and the greater the impact these increasing flows will have.[6]

In addition, the Intergovernmental Panel on Climate Change (IPCC) has been increasingly emphasising the risks of various tipping points. These are critical thresholds that, when breached, will lead to large, accelerating and irreversible changes to our climate system. According to the most recent IPCC assessment report from 2021, the risk of reaching these tipping points is already assessed as being high if the average global temperature increase amounts to between 1.5 and 2.5 degrees. And it is assessed as very high if global temperatures increase by 2.5 to 4 degrees.[7] Climate science can provide indications of

potential tipping points and what their consequences might be, like the melting of the Greenland ice sheet and the impact it would have on global sea levels. There is, however, no scientific consensus yet on the systemic changes that might occur after these tipping points are reached. Further research is therefore urgently required here, especially in light of the current trajectory for global heating.[8] Over the last 12 months, the global average temperature was already 1.5 degrees above pre-industrial levels.

Structural economic challenges

Let me now turn to the implications for the global economy if temperatures increase by significantly more than 2 degrees. The structural economic consequences will be profound, with impacts on both the supply and demand sides of the economy.

First, resources will have to be dedicated to protecting citizens and society from increased climate and natural hazards like wildfires, droughts and floods.

Second, to the extent that the increase in hazards can no longer be avoided, the economy will need to cater for the critical needs that the European Environment Agency identifies as being at risk. Specifically, maintaining adequate food production, water availability and health care will require substantially more resources than those sectors currently receive.

Third, beyond catering for these critical needs, the economy will undergo further structural transformation as both preferences and production possibilities change. Tourism is a case in point, with destinations that are currently popular no longer being similarly in demand or even accessible in the future. Another example is international trade, which may be forced to redevelop as existing routes and ports become unavailable and others open up. And there will also be a reallocation between sectors, with some losing out while others benefit, much like we have seen following the pandemic and the energy crisis.

Fourth, the economy needs to be made resilient to the increase in climate and natural hazards. The existing capital stock – including people's homes – will need to be upgraded and adapted, with all the increases in structural costs this entails. Achieving such resilience may even require physically relocating part of the capital stock to avoid proximity to areas that will be heavily exposed to hazards.

Any capital stock that is not made resilient to hazards will most likely see its economic lifespan shorten significantly. This will take the form of higher depreciation rates, which imply greater financial risks for anyone with exposures to the capital stock. It is particularly noteworthy that investments that are currently being made to green the capital stock may not be immune to this effect. For example, a hydroelectric power plant may become obsolete prematurely if a river runs dry or changes course. Resilience to the more disastrous climate and nature outcomes that are the consequence of failing to meet the Paris Agreement goals should, therefore, feature prominently in any decisions related to mitigation investment that are being taken today.

A key challenge for economic policymakers will be to ensure that the economy is suitably prepared to undergo these structural transformations. If it is not, there is a significant risk that economic and financial

factors will actually exacerbate the critical challenges we will face in a world that overshoots the goals of the Paris Agreement.

Against this backdrop, it will be crucial for economic policymakers to identify potential barriers to effective and efficient adaptation. First, a failure to coordinate may lead to investment being misallocated. Some investments may not materialise at all if the private sector fails to consider the benefits for society. And others may materialise but only inefficiently, for example if investment in cooling homes and offices takes place at the level of individual households and firms.

Second, structural adjustment in an economy requires the right combination of flexibility, education and social safety nets to navigate an inclusive and effective adaptation process.

Third, financial bottlenecks may emerge. Increased uncertainty due to potential climate and natural hazards may lead to an increase in risk premia, which in turn could hold back investment. And this situation could be exacerbated if it is no longer possible to obtain insurance against certain risks – or if it is only possible at a prohibitive cost.[9] Besides the greater frequency and impact of hazards, uninsurable risks occur when hazards become systemic – in other words, when a hazard would affect the entire population at once if it were to materialise. And when such risks are uninsurable, individuals and firms – as well as the financial institutions that finance them – need greater loss-absorbing capacity themselves. This self-insurance will mean that – all other things being equal – the aggregate propensity to invest decreases further.

Bottlenecks in the flow of finance that reduce investment or that lead to misallocation can be mitigated with a sound banking system and well-developed capital markets that bolster transparency and ensures climate- and nature-related risks are properly priced. Against this backdrop, there is an urgent need to complete the banking union and the capital markets union – as the ECB has previously called for – irrespective of the climate and nature scenario that ultimately materialises.

In areas where private investment bottlenecks cannot be resolved, governments may need to step in with increased public investment and safety nets. This would give rise to significant government contingent liabilities that are not yet appropriately reflected in credit ratings or in institutional economic governance frameworks.

The relevance for central banks and supervisors

Many of the challenges I have mentioned – both the critical and the structural economic challenges – fall to policymakers in other areas, rather than central banks and supervisors. But the challenges presented and the policy choices that are taken in response will have a bearing on the environment in which central banks and supervisors pursue their mandates to maintain price stability and ensure the safety and soundness of banks.

First, our objectives are even more important in a world that is facing increased climate and natural hazards. Price stability and sound banks provide an anchor that makes an economy – and therefore a

society – more resilient to shocks. The more frequent and intensive the shocks, the more important it becomes that the anchor doesn't break.

Second, while our tasks become more important when the world around us becomes more daunting, maintaining price stability and a sound banking sector becomes more complicated. And this is not just because shocks are more frequent and more intense. It also becomes more complicated to assess the type of shock that is hitting the economy, yet this is crucial to gauging the potential risk to price stability or to the soundness of banks, as well as the appropriate policy response. It could raise questions about whether climate and natural hazards can be fully captured in the traditional categorisation of demand, supply and financial shocks that are inherent in most macroeconomic models. For example, my fellow ECB Executive Board member Isabel Schnabel has suggested thinking about the impact of climate change on inflation using concepts that she has referred to as "climateflation", "fossilflation" and "greenflation".[10] The Basel Committee on Banking Supervision, meanwhile, has already established that climate-related risks translate into the traditional types of risk that banks consider.[11] This covers credit risk, liquidity risk, market risk and operational risk, including litigation risk.[12] However, the exact mechanisms of mapping actual hazards to risks still need to be analysed further to fully capture climate-related factors in quantifiable regulatory and supervisory requirements.

Third, climate and natural hazards limit the productive capacity of the economy. Some of the consequences may eventually fade – although they may well persist for quite some time – for example if supply chains are disrupted as a result of hazards materialising. Others may be permanent, for example if nature providing critical services – including land use and fisheries – becomes degraded. In both cases, the risk of the economy running into capacity constraints would be greater. Therefore, to properly assess the state of the economy and identify risks, central banks and supervisors need to further deepen their understanding of the supply side of the economy, just as we had to do after the pandemic and the energy crisis. This also means that we need to extend the horizon of our analyses well beyond the typical horizon considered today. Climate science gives us a window into the rest of this century. What we can see through this window should be taken seriously, including by central banks and supervisors as we identify and assess risks in the pursuit of our mandates. The time to think seriously about the long term is now.

Fourth, the combination of heightened uncertainty and a greater need for self-insurance could lead to an increase in the propensity to save in the private sector. This could create space for the investment that is so urgently needed and – in the absence of increased savings – would lead to an increase in the equilibrium real interest rate.[13] At the same time, if owing to coordination failures the increased savings are not channelled towards providing the investment needed, the equilibrium real rate of interest would instead be depressed. As this equilibrium rate is the interest rate that prevails when all shocks to the economy have dissipated and monetary policy is neither accommodative nor restrictive, it is an important yardstick for central banks. Thus, for monetary policy, understanding which of these effects ultimately dominates will be key.

Fifth, increasing financial risks arising from the climate and nature crises can impair the soundness of financial institutions and the stability of the financial system as a whole. Should these risks materialise – despite all our efforts to mitigate them – the transmission of our monetary policy could be affected. Monetary policy decisions would be transmitted through the financial system and the economy in a less orderly and less predictable manner, potentially making it more difficult for us to achieve our price stability objective.

More generally, the effectiveness and efficiency of our policies benefit from well-functioning markets. This holds true in terms of both our ability to maintain price stability and the need to avoid the risk of our monetary policy impulses unduly contributing to a misallocation of resources.

Concluding remarks

Let me conclude.

The Temple of Apollo in Delphi famously bore the inscription “Know thyself” – a maxim that is often understood to mean “know your limits”.

Know what you know and know what you don’t know – this is what I have sought to convey to you today. And act upon that knowledge in a way that is robust in the face of known and unknown uncertainties, to avoid making avoidable mistakes like that of King Croesus after he consulted the oracle of Delphi. This includes identifying and seeking answers to questions that reduce uncertainty and increase the scope of “no-regret” policy actions. This will require policymakers to engage with stakeholders beyond their own fields of expertise – just like the Bank of Greece is doing through the interdisciplinary Climate Change Impacts Study Committee, which recently announced the preliminary results of analytical work on the economic, social and environmental impacts of climate change in Greece.[14] Experts from all disciplines – including climate and nature scientists, biologists, economists, legal experts and sociologists, to name just a few – will need to work closely together in responding to the multifaceted challenges ahead. If ever there was an urgent need to pool knowledge and draw on different fields of expertise, it is now.

Let me be clear: my remarks today are by no means a signal that we should throw in the towel on mitigation. Quite the opposite. I hope that I have been able to show you why, in light of the prevailing climate science, no effort should be spared in working towards the goals of the Paris Agreement. The European Climate Law requires it, and the European Court of Human Rights has ruled that governments that fail to meet their climate commitments are violating human rights. Analysis by the ECB and other central banks and supervisors repeatedly shows that, from an economic perspective, an orderly transition is by far preferable to alternative scenarios of doing nothing or doing too little too late.[15]

That said, even though climate and nature policymakers are under a legal obligation to deliver on the goals of the Paris Agreement and even if they have committed to achieving these objectives, they still have a duty to prepare for risks that lie ahead as the entire world needs to live up to its obligations – and it is not a given that it will – and critical thresholds may have already been surpassed. The duty to prepare

for these risks also holds for central banks and supervisors in the pursuit of their mandates. We must both unwaveringly strive for the best and diligently prepare for what climate science tells us lies in store.

It is not a Delphic prophecy that is calling for action. It is facts and science.

Thank you for your attention.

1.

To my knowledge, there are at least three instances of central banks and supervisory authorities paying tribute to the ancient oracle. The semi-structural macroeconomic model of the Dutch economy that De Nederlandsche Bank uses for its projections is named DELFI. In ECB Banking Supervision we have developed a tool named Delphi that integrates market indicators and information from the media to better understand risk developments affecting banks in real time. And central banks have been described as giving "Delphic" forward guidance when communicating about how they intend to adjust policy in relation to incoming data.

2.

I have emphasised in other speeches that central banks are not climate and nature *policymakers*, but climate and nature *policy takers*. See, for example, Elderson, F. (2023), "Policymakers as policy takers – accounting for climate-related and environmental factors in banking supervision and monetary policy", speech at the Peterson Institute for International Economics, 21 April.

3.

European Court of Human Rights (2024), "Judgment Verein KlimaSeniorinnen Schweiz and Others v. Switzerland – Violations of the European Convention for failing to implement sufficient measures to combat climate change", press release, 9 April.

4.

United Nations Environment Programme (2023), *Emissions Gap Report 2023: Broken Record – Temperatures hit new highs, yet world fails to cut emissions (again)*.

5.

European Environment Agency (2024), *European climate risk assessment*.

6.

According to the World Bank, climate change could contribute to the movement of 216 million people within their own countries by 2050, unless concrete climate and inclusive development actions are taken. See Clement, V. et al. (2021), *Groundswell Part 2: Acting on Internal Climate Migration*, World Bank Group, Washington, D.C.

7.

Intergovernmental Panel on Climate Change (2021), *Climate Change 2021 – The Physical Science Basis*.

8.

The Central Banks and Supervisors Network for Greening the Financial System has previously developed scenarios to assess how economies might look on different climate policy paths. In future work it will prioritise the inclusion of non-linear elements – like climate tipping points – in its models (see Aerts, S., Spaggiari, M. and Stracca, L. (2023), "Climate scenarios: procrastination comes at high cost", *The ECB Blog*, 4 December). For it to achieve this, climate and nature science will be crucial in advancing its understanding of tipping points.

9.

Together with EIOPA the ECB has issued a discussion paper that outlines policy options to promote climate catastrophe insurance that could mitigate the effect of reduced insurability, see ECB and EIOPA (2023), "Policy options to reduce the climate insurance protection gap", *Discussion Paper*, April.

10.

Schnabel, I. (2022), "A new age of energy inflation: climateflation, fossilflation and greenflation", speech at a panel on "Monetary Policy and Climate Change" at The ECB and its Watchers XXII Conference, 17 March.

11.

Basel Committee on Banking Supervision (2021), *Climate-related risk drivers and their transmission channels*, April.

12.

On litigation risk, see Elderson, F. (2023), ""Come hell or high water": addressing the risks of climate and environment-related litigation for the banking sector", speech at the ECB Legal Conference, 4 September.

13.

See, for example, Schnabel, I. (2024), "R(ising) star?", speech at The ECB and its Watchers XXIV Conference session on Geopolitics and Structural Change: Implications for Real Activity, Inflation and Monetary Policy, 20 March.

14.

Bank of Greece (2023), "Preliminary results of the studies on the vulnerability assessment and the impact of climate change in Greece", 15 December.

15.

Emambakhsh, T. et al. (2023), “The Road to Paris: stress testing the transition towards a net-zero economy”, *Occasional Paper Series*, No 328, ECB.