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Abstract

The transition to a green economy is arguably the most important economic transformation of the next decades. To be completed it requires the mobilization of astounding resources, a flow of technological innovation and a whole series of new rules going from technical standards to financial regulation. Given the resources it needs, the transition, to be credible, requires a full engagement of the financial system. On this regard we analyze the policy set-up of Europe, the most advanced area on the issue. We identify a three-layer functioning of the EU project for transition. The first one ("green products") is fully compatible with the present financial system. A second layer entails changes in the business model and organization of financial operators but it can be phased in with minor overhauls. Finally, there is a third layer, largely incompatible with the present financial system, yet crucial to achieve transition. We show that, according to the same EU analysis, the transition needs a total change in the financial landscape and therefore it is, rebus sic stantibus, intrinsically unfeasible. We suggest ways to escape the dilemma that connects financial stability and green economy.

JEL Classification: G28, Q54
Keywords: climate change, sustainable finance, EU

1. *Introduction: the systemic dimension, finance and environment*[*]

The 2008 crisis marked a turning point in modern history, showing how mistaken were mainstream theories and ensuing policy prescriptions. For a moment the establishment was left in what Greenspan described as "a state of shocked disbelief" (Andrews, 2008). Although as soon as banking panic was tamed and markets regained their temper, the shock faded away and the old habits returned, some lessons have been learned. One of the most precious lesson is that systemic risk had been strongly undervalued (Stiglitz, 2010). It is now clear that banking concentration and financialization entailed a massive growth of systemic risk that was not intercepted by micro-prudential tools and mainstream models (Galati and Moessner, 2011). Systemic risk is now widely studied in its nature and many proposals are coming out on how to measure and to tame it (Acharya et al. 2010; Esposito, 2013; Zlatic et al., 2015), prudential requirements on globally systemic banks being an example of this trend (BCBS, 2014). In this framework, systemic risk has been analyzed also as a negative externality, so that, for instance, pigovian taxes on big banks have been proposed (Dia and VanHoose, 2013; de Mooij and Nicodème eds., 2014).

During the unfolding of the world financial crisis, we saw a growing awareness of another threat to the world economy: climate change (UNEP, 2011). If the crisis has shown the importance of ensuring financial stability, extreme weather events and climate change are emerging as another systemic risk for the world economy (WEF, 2017). Together financial stability and green transformation will be two of the main drivers of the world economy for the coming decades. In this context, there is a proliferation of studies on the transition to a green economy (OECD, 2015)[1]. What emerges from these analyses is a deep

[*] This paper has been developed at the Department of Economic Policy, Università Cattolica del Sacro Cuore, Milan. The authors wish to thank Andrea Molocchi and the participants to the seminar of the 26th October 2018 at the 59th Annual Conference of the Società Italiana degli Economisti (Bologna) for helpful discussions on these issues.
The views expressed by Lorenzo Esposito do not involve the responsibility of the Bank of Italy.

[1] From now on, by "transition" we mean the transition to a green economy.

connection between the two aspects ("green finance"[2]). Many studies try to assess how the financial sector can help the transition (ESRB 2016; G20 2016; PRA 2015). On a theoretical level, they are trying to analyse how the production and management of a public good (financial stability) can help the production of another public good (a healthy environment). In this paper we try to give a contribution to this aim analyzing the EU framework for sustainable finance, to assess if and how it helps the transition.

2. *The landscape: climate change, green economy, sustainable finance*

Although a structured discussion on climate change is a relatively recent issue (the First World Climate Conference was held in 1979, and the Second not until 1990) there are historical antecedents dating from the French scientist Jean-Baptiste Fourier who identified the greenhouse effect in 1827 (Evans and Steven, 2008). In the 50s the dangers of pollution became apparent, especially for some glaring episodes like the 1953 'killer smog' in London that showed how pollution could cause thousands of deaths in just a few days. However, the connection with a rise in the average temperatures was detected only thanks to the high-accuracy measurements of atmospheric CO_2 concentration, initiated by Keeling in 1958 that "constitute the master time series documenting the changing composition of the atmosphere" (Le Treut et al., 2007). The Keeling measurements at the Mauna Loa observatory in Hawaii showed an indisputable annual increase, revealing an average warming of 0.5-0.6C over the last 150 years (Harding, 2007). In the 80s other environmental issues came to the fore (acid rain and the 'ozone hole' over Antarctica, which led to the 1987 Montreal Protocol). In 1988 the Intergovernmental Panel on Climate Change (IPCC) was set up by the World Meteorological Organization and the United Nations Environment Programme (UNEP) to coordinate researches on global climate change.

[2] See, for instance, the website of the EC on the topic: https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance_en.

It is interesting to note that at the beginning, a strong and effective lobbying activity was directed against the IPCC; through the years, large companies understood that a green reputation was a good marketing strategy[3]. So at the end of the 90s, one after the other, they changed direction and in 2002 the GCCC, the umbrella lobby group against the IPCC, was disbanded (Evans and Steven, 2008). In 1992, the UN Framework on Climate Change (UNFCCC[4]) was adopted at the Rio Earth Summit. The framework called for action aimed at stabilizing atmospheric concentrations of greenhouse gases to avoid "dangerous anthropogenic (human-emitted) interference with the climate system". The UNFCCC came into force on 21th March 1994. In 1995 there was the first Conference of the Parties (COP for short) to review the implementation of UNFCCC; the first meetings (COP1) were held in Berlin, followed by subsequent conferences almost every year (Sinha, 2015, UNFCCC 1995). The proof of the new attitude by governments as well as firms and the public opinion was the 1997 Kyoto Protocol (COP3) that set binding targets for 37 industrialized countries and the European Union to reduce greenhouse gas emissions by roughly 5% below 1990 levels by 2012.

It is important to point out that "Kyoto was a battle between countries with different interests and priorities" (Evans and Steven, 2008). This was true not only between developed and developing countries but also among advanced economies, especially between the two shores of the Atlantic. In fact, although the Kyoto Protocol was signed by the US President Clinton, in 2001 President George W. Bush withdrew the United States from the Protocol due to concerns that limiting greenhouse gas emissions would harm the US economy. This was only the first of US about-turns on the issue. The last one was in June 2017, when President Trump announced his intention to withdraw the United States from the Paris Agreement (the COP21)[5], signed by President Obama, with the aim of keeping global warming below 2°C.

[3] For an example on how the financial system now deals with this marketing strategy, see VV AA, *Banking on Climate Change*, 2018.

[4] See the website: www.unfccc.int.

[5] See the UN website on the issue ttp://unfccc.int/paris_agreement/items/9485.php, see also http://www.cop21paris.org/about/cop21.

Nowadays, the problem is largely considered as one of the most if not the most important facing humankind. The scale of the task is immense: "The 2014 New Climate Economy Report estimates that some US$90 trillion will be needed between 2015 and 2030 to achieve global sustainable development and climate objectives" (GFT, 2018). A UNEP 2011 Report put the costs to world economy at US$6.6 trillion for 2008 that will grow to 28.6 trillion in 2050 (18% of the world GDP). But delaying action is even worse: "in the absence of further action to tackle climate change, the combined negative effect on global annual GDP could be between 1.0% and 3.3% by 2060. As temperatures could continue to rise to a projected 4°C above pre-industrial levels by 2100, GDP may be hurt by between 2% and 10% by the end of the century relative to the no-damage baseline scenario" (OECD, 2015). Some sectors and countries are going to pay more. For instance: "changes in crop yields and in labour productivity are projected to have the largest negative consequences" (ibid.).

This last observation is useful to make it clear that, besides the impressive absolute dimension of the problem, transition entails "distributive and intergenerational justice issues" (Cass, 2010). For instance, climate change will harm some areas more (typically Africa and Asia and coastal areas; OECD, 2015) while others could be even positively affected (FAO, 2017, pp. 39 and following). Should the latter compensate the former? There is no legal basis for this compensation. Secondly, there is a social redistribution effect due to pollution in general and to climate change in particular. For instance in Italy, households pay 70% more of the external costs they produce, firms 26% less and there are differences also among economic sectors (Molocchi, 2017). The scale of the problem and its multifaceted consequences explain why the UNEP was created, although without much power to act, so far.

An important part of the transition is how to engage the financial system, and in particular, the banking sector (Batten et al., 2016). The connections between finance and transition are manifold and sometimes complicated to detect. Anyway, the idea of sustainable finance is gaining traction with the idea of financing investments that take into account

environmental, social and governance considerations[6]. Banks can help to finance the transition and indeed they have to, because climate change also yields financial disruption. In fact, the importance of the topic has pushed central banks and financial intermediaries to analyse the "transition risk" that, if not tackled, could lead to a "climate Minsky moment" (Scott et al., 2017[7]). Connections between finance and transition confirm the wealth redistribution effects of climate change. For instance, a swift change in the energy mix of world economy would disrupt many economic sectors: decarbonization "would shift the economic balance of some countries and change the business models of several industries" (Covington, 2017). Should they be compensated or simply left going in default? The fact that the transition risk is completely undetected by equity markets can be explained either by the fact that markets are not efficient or by the fact they don't believe in a rapid transition (Silver 2017, Thomä and Chenet, 2017). Probably both explanations are true.

Besides the general topic of sustainable finance, due to the differences on how environment is changed by human activities, the UNFCCC proposed the idea of *climate finance* that is a framework where developed country parties are to provide financial resources to assist developing country parties in implementing the objectives of the UNFCCC[8]. The Paris Agreement established a financial mechanism to provide financial resources to developing country parties starting with a Green Climate Fund that has a present commitment of $3.7 billion[9]. How to fund the green economy will be a core aspect of international finance in the next years. Therefore sustainable finance is at the core of the transition.

Pollution is one of the most emblematic examples of negative externality (Stiglitz, 2000). Typically, governments tackle it using price mechanism (the "carbon tax"[10]). Sustainable finance is a different way

[6] See Rezende de Carvalho Ferreira et al., 2016 for a survey on socially and environmentally concerned investment practices.

[7] On transition risk see also Batten et al., 2016 and, for the Italian scenario, Bernardini et al., 2017.

[8] On the issue see: https://unfccc.int/topics/climate-finance/the-big-picture/introduction-to-climate-finance.

[9] See its website: https://www.greenclimate.fund/home.

[10] For an application to Italy, see Faiella and Cingano, 2015.

to change relative prices using funding costs as a lever. What is needed is a general policy to connect all these tools. A point in favor of using finance instead of taxes is that changing the relative price of funding green projects could prevent the externality to be produced; after all, no economic sector can exist without a proper funding by the banking system. This conclusion is also connected to legal consequences. In fact, there is a growing literature on the banks' environment responsibility (the so called *sustainable lending*, Bouma et al., 2001) that deals with the direct legal costs and with reputational risks coming from funding of controversial projects and firms (Ulph and Valentini, 2004; Aspromonte and Molocchi, 2014). The idea of "lender liability" is also part of many laws such as the US 1980 Comprehensive Environmental Response, Compensation, and Liability Act (Bearden, 2012, see also Wolford, 2014), the 1993 Lugano Convention (EC, 1993) and the UK 1995 Environment Act (Dechezleprêtre and Sato, 2014). Although in a negative way, these laws confirm the importance of the connections between the banking system and transition.

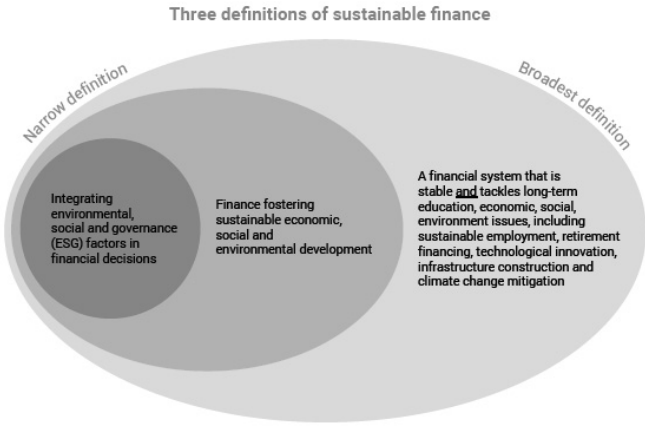
3. The three layers of EU intervention on sustainable finance

Europe is at the forefront of the fight against climate change, having put sustainability at the core of its development strategy. The starting point is the need to re-orientate public and private financial flows towards green and sustainable efforts. Tools like the European Fund for Strategic Investments (EFSI) or the Capital Markets Union Action Plan are already there, but much more is needed. To develop an overall vision of sustainable finance, European Commission decided to appoint a High-Level Expert Group "to help develop an overarching and comprehensive EU roadmap on sustainable finance". The Group produced an Interim Report in 2017 and a Final Report in 2018[11]. As it is clearly stated in them, Europe wishes to keep its leadership in sustainable finance. In fact, the EU also contributed to the development of the 2030 UN Agenda for Sustainable Development where financial issues are paramount and the European Commission released an Action Plan for a greener economy based on the recommendations of the Group (Press Release, 8th March 2018). Afterwards, the EC delivered the first

[11] From now on IR and FR.

concrete actions to enable the EU financial sector to help the transition (Press Release, 24th May 2018). Finance is an essential lever for achieving transition and the EU connects the transition to ambitious goals such as economic prosperity, social inclusion and environmental regeneration. Of course it is difficult to disentangle European institutions' genuine care for the environment from propaganda in an epoch of trade wars. After all, austerity has meant misery for tens of millions of European households and one can doubt about Europe's concern for the future of environment when it doesn't seem to care for the present poverty of its citizens. In its turn, misery yielded a worsening of pollution, especially in Greece (Fuller, 2016), therefore more austerity meant more pollution. Anyway, especially after the signature of the Paris agreement on 2015, EU put itself at the forefront of the shift towards a low-carbon society, with its pledge to reduce CO2 emissions by 40% in all economic sectors by 2030.

For the transition to be completed the full resources of society will have to be mobilized. The scale of the investment challenge in the EU analysis "is well beyond the capacity of the public sector alone" (FR, p. 2). This statement seems factual, but in reality it comes from a political choice. As the crisis has shown, if deemed important, public sector resources can be mobilized to the full to tame the storm, i.e. to save the banks. For instance, between September 2008 and December 2010 the Commission authorized aid for an overall drawable amount of €4.3 trillion that was almost a third of the EU GDP (Millaruelo and del Río, 2017), a sum even higher than what is needed to kickstart the transition. Clearly, for European authorities transition is not as important as saving big banks. Therefore, public resources available are tiny (for instance the EFSI has generated about €90 billion of investment into energy, environment and resource efficiency) and the transition will need financial markets. However, the financial system has proved to be quite reckless in the last decade, therefore, to lead the way in the transition, EU needs "no less than a transformation of the entire financial system, its culture, and its incentives" (FR, p. 2). The problem is the huge gap between this general proclamation on the importance of sustainable finance and the practical proposals coming out from the very same reports. In particular, we can detect three different layers of sustainable finance based on an assessment made by the very same EU experts, that, in the Interim Report, proposed this tripartite definition (IR, p. 12):



Basing ourselves on these different definitions of sustainable finance, we analyse the EU Reports to see their contradictory nature and to propose alternatives.

3.1. The good: rules and green products

The first most superficial level by which sustainable finance is connected to transition is what the IR calls "integrating environmental…factors in financial decisions". This means a series of rules to improve something that is already under way, for instance norms on disclosure, corporate governance, reporting and so on that have been for many years part of financial regulation. Basically all the "early recommendations" of the IR are in this layer. They are part of the re-regulation wave born to answer the 2008 crisis and they suffer from the same problem: they go in the right direction but not rapidly enough to prevent another crisis because they do not change the basic tenets of banks' business model (Mastromatteo and Esposito, 2016, p. 43).

One of these rules deals with green financial products. The proposal is that the EU should introduce an official Green Bond Standard and a Green Bond label to help the development of green products. The aim is to promote "green finance" that, in this context, is like a new product line as other "eco-friendly" commodities. It is a good marketing move

and it makes sense also on a regulatory basis. Banks and asset managers can sell green products without changing a thing to their business model exactly like a superstore can sell vegan food besides meat and poultry. This is not a secondary development: green economy funding gap is still conspicuous (OECD, 2011) not only in bank lending but also in securities, with less than 1% of global bonds labeled as green (G20, 2016, p. 3). Only for the EU, funding gap for the transition is estimated at around €180 billion per year (IR, p. 2). The reason why public institutions are proposing to mobilize the financial system is that, as we said, the dimension of the financial needs is considered beyond the capacity of the public sector. Authorities are thus creating a legal framework to sell green products. Data confirms that the green fad is well under way: "Over US$3.3 trillion of private climate finance has been mobilised to date; the global green bond market in 2017 reached US$155.4 billion new issuance in the year, compared to US$81.6 billion in 2016" (GFT, 2018, p. 11). The creation of benchmarks and market indices is also a boost to green products. The "concrete actions" proposed by the EC are based on HLEG recommendations and therefore are all well inside the layer 1 (taxonomy, disclosure, information to clients and so on[12]).

The rules on green finance products are used to help the development of the market or, to be more precise, the single national markets. Every nation is trying to promote its financial hub in a framework of strong international competition. This is very clear in the case of UK government that explicitly uses green finance to help the City (the GFT report links green finance goals to the "consolidation of UK leadership in green finance", p. 59 and following). So much for a cooperative effort to decarbonize the world.

3.2. The bad: a green business model

Green products help but they cannot change the landscape of the financial system. At least not rapidly enough. Superstores have sold eco-friendly products for decades but this did not change much in the consumers' behavior until the other products were prohibited or in some way strongly discouraged.

[12] http://europa.eu/rapid/press-release_IP-18-3729_en.htm.

This is also because consumers cannot pay too much for green products, especially in years of crisis, low wages and so on. Moreover, the emphasis on "information" is misplaced. It is not sufficient for consumers to be informed. For instance, smokers or heavy drinkers know that they are basically killing themselves and yet they keep on. By the same token, after the crisis, regulators gave a strong importance to financial education, but this cannot change much *per se*. The crisis was directly originated by the reckless behavior of big banks CEOs. Are we implying that Fuld, Schwartz or other top managers needed financial education in the 2000s? Education and information are important, but far from enough. Climate change needs much more and at much higher speed. We need green regulation able to change things. The second and deeper layer of sustainable finance is thus linked to a financial system able to foster a sustainable development. In practice, this means a regulatory framework able to change the banks' business model to comply with the aims of COP21.

For finance to be sustainable it needs specific actions by monetary policy and by banking regulation with obvious inter-linkages. The relation between monetary policy and the transition has been studied as far as growth (Barkawi and Monnin, 2015), rules for central banking operations (Matikainen et al., 2017) and interest rates setting (Rozenberg et al., 2013) are concerned. Before the crisis, monetary policy was confined to keeping inflation low. With the crisis, financial stability and growth have regained importance. The new role of central banks can be seen also in the dimension and composition of their balance sheets after many rounds of QEs. Assets connected to sustainable finance can be easily put into this picture. What is true for central banking is also true for banking regulation.

The same EU Reports emphasize the role of banking regulation to help the transition. The most important point is financial stability. After 2008 the importance of financial stability has been rediscovered (Dombret and Lucius eds., 2013). Besides more traditional factors that have been considered, it is now clear that climate change as well can derail financial stability because "climate systemic risk is a potential source of financial disruption" (Aglietta and Espagne, 2016), for instance by destroying the capital of the firm or provoking rapid portfolio reallocation (Dafermos et al., 2018). Regulation is also a defensive move because the strong uncertainty and the global nature of

the transition can hit particularly insurance and banking sector. For instance, it has been estimated that the European financial institutions are exposed to fossil-fuel firms for more than €1 trillion and to potential losses up to €400 billion (ESRB, 2016). The importance of fostering a new financial regulation to help transition is made more compelling by the fact that the crisis has reduced green economy investment in line with the general reduction of credit growth but also for specific reasons (Campiglio et al., 2017). Moreover, Basel III has been considered a specific cause for the funding gap of the green economy (Liebreich, 2013, and Narbel, 2013). All in all, financial barriers to the transition are mounting (Ghisetti et al., 2017). First of all, there is an issue of composition of assets that are distorted towards tangible assets that are easier to be pledged as collateral, thus increasing emissions (Andersen, 2017). Secondly, in a situation of credit crunch or at least risk aversion by banks, financing green economy can be considered too dangerous and the banks can play it safe funding more traditional technologies, entrenching technological lock-ins and old oligopolies (Ghisetti et al., 2015).

Although the importance of financial regulation is clear, so far the proposals have been poor (for instance a more structured corporate disclosure and a specific design of stress tests, Villeroy de Galhau, 2015; see also ICBC 2014, and Signorini, 2017, and on how to integrate sustainability into accounting standards, the IR). All these proposals can be considered layer 1 issues, because they are not able to change significantly bank's business model. What is needed to this aim is prudential supervision. In fact, European authorities are exploring how to incorporate sustainability factors into the Basel II supervisory review process. In order to help the transition, the creation of specific prudential tools has also been suggested, although the measures that have come out so far concerned reserve requirements, not prudential supervision (Campiglio, 2014, and Rozenberg et al. 2013). Suggestions on lowering minimum capital requirements for green assets are starting to emerge (IR, pp. 32 and 62 and the "green supporting factor" of the FR). Recently, Esposito, Mastromatteo and Molocchi (2018), proposed to modify the banks' assets weights used for capital requirements to internalize the pollution risk of the borrower. Thus prudential regulation would move from the present risk weighted assets to *environment-risk weigthed assets*. The proposal aims to allow financial regulation to take

into account important relationships between pollution and credit. ERWAs entails a deep change in regulation and therefore in the business model of the banks. It is an example of how it is possible to push the financial system to be functional to the transition although very gradually.

3.3. The ugly: a green world

Transition is such a momentous goal with repercussions on every aspect of economic and social life that it is impossible to over-estimate its importance. Reflections on its causes and consequences should change the way we look at the economy in general. As Mathur and Berwa (2017) put it:

"The capitalistic ideology of unabated growth leading to amelioration of the greatest ills of humanity – poverty – via the trickledown theory has ceased to bear fruit. The dismal condition of world's poor, rising global social unrest, mass exploitation of the ecosystem, global warming, depletion of natural resources and deterioration of environment, are causes of grave concern today. As we look ahead, we recognize the necessity to build the foundation of a new era of sustainability"

To bring about this new era, deep reflections on the present economy are needed. There are important observations in the Reports that hints at the scale of change needed to make the transition real and that go far beyond climate change issues. For instance: "Reflecting these concerns, building a fairer Europe and strengthening its social dimension have become a priority for the Commission…The financial system should be a vehicle for promoting these objectives by embedding social and other sustainability considerations into capital allocation, and by promoting more socially sustainable approaches to finance" (IR, p. 85). How this is compatible with the general economic policy that rules Europe is at least unclear. Anyway, the EU boldly identifies problems with the present financial system. In particular this is true for the core point of the time-life of investment. Transition implies long term investment. Unfortunately, financial markets are going in the opposite direction. This is an old theme dating at least since the discussion of the "beauty contest" in Keynes' *General Theory*. In fact, analyzing financial markets, Keynes observed that modern capitalism is based on the

separation of ownership and control of the enterprises. The separation implies that the capital markets have a key influence on investment and hence on business cycles, that are based on investment waves. Capital markets allow for a far wider funding of the firms, thus facilitating investment, but they also increase instability because they induce a continuous re-assessment of assets value. Therefore, institutional investors yield higher volume of credit at firm's disposal but also "short-termism" in the financial markets (Whalen, 2017). The frequent rotation of managers among firms also make corporate strategies more alike (Pasinetti, 2009). This means that green "sectors" or "firms" are more a marketing strategy than a true specific business model. All in all there is an increase in uncertainty and short-termism (Mazzucato and Penna, 2015) that plays against transition that is by definition a long term plan (because "sustainable finance is axiomatically linked to the long term", IR, p. 9).

Reports are aware of this fact: "Recent trends suggest that short-termism in the financial sector may have got worse, with the average holding period of market-traded assets becoming shorter" (FR, p. 46) and therefore: "The HLEG sees short-termism as a clear challenge and potential obstacle for the establishment of a sustainable financial system and has already highlighted the issue in its interim report" (FR, p. 47). This aspect can doom the whole project, so we would expect courageous measure to face it, but this is how concretely EU tackles the issue: "The policy priorities should therefore be to lengthen the time horizon and broaden the conception of risk" (IR, p. 19), of course but how? The reality is more sober: "There is no single parameter that could switch off 'short-termism' and move finance to the long term, aligning it with all the major economic challenges that demand a long-term perspective. Nevertheless, progress can be made through, first, *continued emphasis by policy-makers* that what is needed in particular is long-term finance" (IR, p. 20, emphasis added). Other suggestions are added (on financial literacy, social awareness, accounting issues on the IFRS 9), but how all this can confront short-termism is beyond any imagination. The Reports do not put up any feasible way to face the issue.

Financial markets are based on short-termism and this feature is unassailable, but there is an economic player that can be more interested in long term: the State. EU and others have endorsed the idea of a public-private partnership, although the content of this relation is

unclear to be polite. If we should base our judgment on the historical partnership between the State and financial operators the result would be even too obvious: the public takes the losses and the private takes the profits as it happened before and after the 2008 crisis. There are indications of the same game played in sustainable finance. For instance in 2012 the UK government created a Green Investment Bank that in 2017 was sold to private investors[13]. So much for long term.

The problem is that EU Reports (and more generally international reports on climate change) try to please everyone, thus confining themselves to mountains producing mice. They sell the general scenario of a green economy to the public opinion but the concrete proposals are safely inside the layer 1 to keep banks and large firms on board. In particular, if we look at the recommendations to single operators (banks, insurance companies, pension funds, etc.) they are all vague enough to be in the layer 1 (for instance "Asset managers should ensure that their governance, expertise and stewardship practices take account of sustainability in order to deliver the best possible investment outcome for clients"). They are ambitious ("Putting sustainability at the heart of the financial system", IR p. 5) but only in words.

3.4 Other Institutions' Recommendations

We criticized the EU ambiguity on sustainable finance and its causes but we must also observe that EU is far from being alone in this attitude. Let's see three of the more important examples.

The FSB-G20 Task Force on sustainable finance in its Final Report, developed recommendations around four thematic areas that represent core elements of financial intermediary organizations: governance, strategy, risk management, and metrics and targets (TCFD, 2017, pp. 13 and following) but they are simple disclosure proposals of no effect whatsoever. For instance, for strategy the Report states: "Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material". All well inside layer 1 to say the least.

[13] See the announcement of UK government: https://www.gov.uk/government/news/uk-governments-sale-of-green-investment-bank-completed.

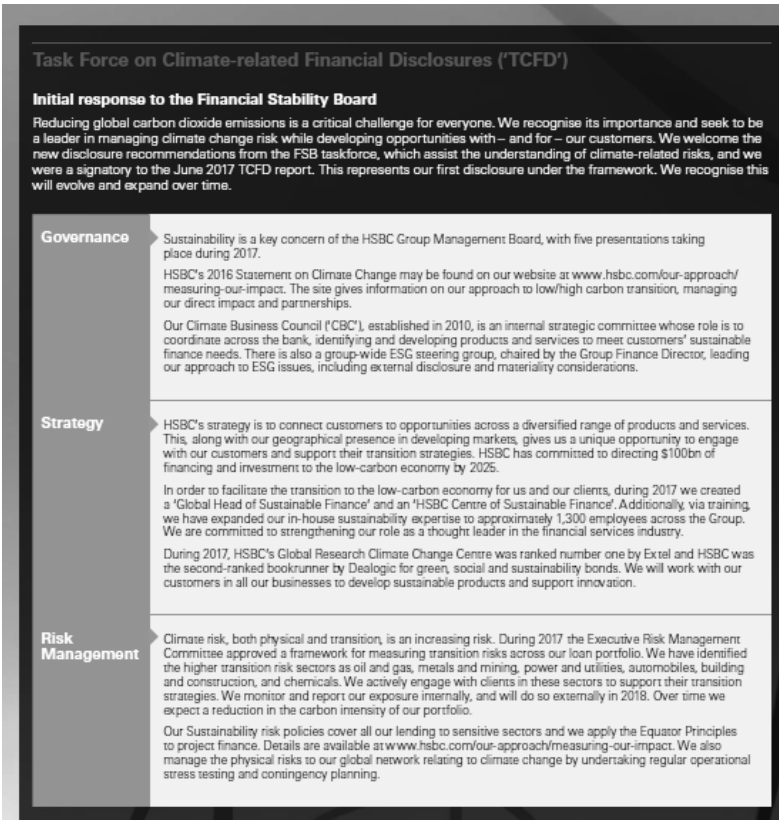
The UK Commission on the issue (the Green Finance Task Force) in its report to government, has proposed vague recommendations (GFT, 2018, pp. 21 and following) that basically aims at fending competition against UK financial system. For instance: “Government and the City of London should establish a new Green Finance Institute brand under which strengthened and rebranded Green Finance Initiative capacity is established”, although it cites “More ambitious reforms for the future”, this refers to the relationship of the country with the EU after Brexit.

The UN Environment Programme has issued a Green Finance Progress Report (UNEP and MELS, 2017) with 7 options all in the layer 1; for instance option 4 (“Support the Development of Local Green Bond Markets”) and option 5 (“Promote International Collaboration to Facilitate Cross border Investment in Green Bonds”).

The EU reports at least show contradictions because they try to overcome the simple recipes of layer 1.

3.5 Commercial banks and climate change

Many commercial banks have put the transition at the centre of their marketing and organizational efforts. For instance this is the case of Industrial and Commercial Bank of China (2014) and of HSBC (2018). It is interesting to observe that these banks not only make proposal in terms of sustainable finance services and products (layer 1) but also in terms of changes needed in their organization, hinting at layer 2 issues (for instance as far as credit risk stress testing for specific industries, risk management and governance are concerned). However, besides product differentiation, the emphasis is basically on reputation and marketing and it is difficult to detect what is the real endeavor towards transition. For instance, HSBC describes in its Annual Report all its projects on sustainable finance summed up in the following table (HSBC, 2018, p. 27):



Task Force on Climate-related Financial Disclosures ('TCFD')

Initial response to the Financial Stability Board

Reducing global carbon dioxide emissions is a critical challenge for everyone. We recognise its importance and seek to be a leader in managing climate change risk while developing opportunities with – and for – our customers. We welcome the new disclosure recommendations from the FSB taskforce, which assist the understanding of climate-related risks, and we were a signatory to the June 2017 TCFD report. This represents our first disclosure under the framework. We recognise this will evolve and expand over time.

Governance	Sustainability is a key concern of the HSBC Group Management Board, with five presentations taking place during 2017. HSBC's 2016 Statement on Climate Change may be found on our website at www.hsbc.com/our-approach/measuring-our-impact. The site gives information on our approach to low/high carbon transition, managing our direct impact and partnerships. Our Climate Business Council ('CBC'), established in 2010, is an internal strategic committee whose role is to coordinate across the bank, identifying and developing products and services to meet customers' sustainable finance needs. There is also a group-wide ESG steering group, chaired by the Group Finance Director, leading our approach to ESG issues, including external disclosure and materiality considerations.
Strategy	HSBC's strategy is to connect customers to opportunities across a diversified range of products and services. This, along with our geographical presence in developing markets, gives us a unique opportunity to engage with our customers and support their transition strategies. HSBC has committed to directing $100bn of financing and investment to the low-carbon economy by 2025. In order to facilitate the transition to the low-carbon economy for us and our clients, during 2017 we created a 'Global Head of Sustainable Finance' and an 'HSBC Centre of Sustainable Finance'. Additionally, via training, we have expanded our in-house sustainability expertise to approximately 1,300 employees across the Group. We are committed to strengthening our role as a thought leader in the financial services industry. During 2017, HSBC's Global Research Climate Change Centre was ranked number one by Extel and HSBC was the second-ranked bookrunner by Dealogic for green, social and sustainability bonds. We will work with our customers in all our businesses to develop sustainable products and support innovation.
Risk Management	Climate risk, both physical and transition, is an increasing risk. During 2017 the Executive Risk Management Committee approved a framework for measuring transition risks across our loan portfolio. We have identified the higher transition risk sectors as oil and gas, metals and mining, power and utilities, automobiles, building and construction, and chemicals. We actively engage with clients in these sectors to support their transition strategies. We monitor and report our exposure internally, and will do so externally in 2018. Over time we expect a reduction in the carbon intensity of our portfolio. Our Sustainability risk policies cover all our lending to sensitive sectors and we apply the Equator Principles to project finance. Details are available at www.hsbc.com/our-approach/measuring-our-impact. We also manage the physical risks to our global network relating to climate change by undertaking regular operational stress testing and contingency planning.

Looking at the table, efforts seem conspicuous but other sources depict a different scenario. In the recent report *Banking on Climate Change*, HSBC is shown as one of the "biggest backsliders", that is banks that instead of committing to real reductions, drastically increased their extreme fossil fuel financing from 2016 to 2017 (VV AA, 2018, p. 9). The Report points out that "If banks like… HSBC continue at these levels of financing for extreme fossil fuel projects and companies, they must reckon with their complicity in the increased social and economic impacts of climate change" (ibidem, p. 20). This is the difference between marketing and the real world.

4. An alternative perspective on public guidance

The essence of the EU framework for sustainable finance is to convince banks and financial markets to endorse transition: private investors are considered the key to transition. This is the legacy of decades of laissez-faire and deregulation that are not put aside, financial crisis notwithstanding, even when discussing how to tackle climate change. However, we have showed hints of a different road that can be taken.

The acceleration in the trends of financialized globalization after the 80s meant also a different role for the State. No more direct production of goods but the role of monitoring of what private producers were doing. State-owned firms were privatized, the supply of welfare state duties were put on private shoulder (pension funds, private healthcare, insurance companies and so on). The EU Reports keep this general scheme: public authorities set the rules and financial markets fund the projects and make the money.

As we observed, the crisis should have disposed of this set-up or at least should have put it into question and should have opened the way for a debate on a new role of the State.

In fact, States have already played a prominent role during the crisis. This brings us to the first point of this discussion: is the transition "too expensive" to be State-funded? The GFT estimate we already mentioned put the financial need at around $90 trillion for 15 years, that is around $6 trillion a year (UNEP, 2016, had similar figures). It seems an astounding sum, but it should be compared with what the States and central banks put up to stop the financial panic after the collapse of Lehman Brothers. Calculating the overall intervention is very difficult but all the estimates are striking: they go from 6 to 14 trillion (Atkinson et al., 2013) and "between USD 60 trillion and USD 200 trillion", (Dombret, in Dombret and Lucius eds., 2013). Only in the US, the federal State put at Wall Street disposal almost 24 trillion, 150% of the GDP (Johnson and Kwak, 2010). This money was given immediately and basically with no string attached. The different rounds of QEs in the US, EU, UK, Japan etc., have confirmed the commitment of public authorities to financial stability with no limitation or, to use Draghi's words "whatever it takes".

The post-2008 events not only show that if the reason is deemed important, trillions of public money are mobilized in no time, but also

that the idea that public debt is bad and private debt is good was unilateral to say the least, especially because private debt rapidly end like a public problem during crises. Moreover, financial intermediaries have proved not particularly able to appraise the actual risk of an asset. It is not clear why it should be different with green assets. On the other hand, central banks were forced to buy financial assets that were uncommon in their balance sheets before the crisis, they could well buy 400-500 billion of green bond a year with no increase in the overall riskiness of their business model, so to speak.

If dimension and ownership of transition-related financial assets are not an issue, one could consider private funding superior for efficiency reasons. However, also on this count, traditional wisdom has been seriously undermined. First of all, the role of private investors in innovation has been proved negligible until the very end, when the technology is marketable. Putting aside the fanfare on venture capital, momentous innovations that create an industry from scratch are too uncertain for private investors: even venture capitalist are not so risk-loving and they typically enter the scene when the idea is already at a pre-commercial testing stage (Mazzucato, 2013, pp. 40 and following). We can predict that also for sustainable finance the pattern will be the same: private funds will flow only when reliable profits will be at hand. Patient capital means public investment: the long-term approach is the only way to create new economic sectors, thus stimulating band-wagoning by private firms and investors.

Secondly public investment is fashionable again exactly because after the crisis private funding is scant. Even “the G-20 has called for ramping up public investment to raise long-run economic growth” (IMF, 2015). Of course, not all public investments are created equal and “the economic and social impact of public investment crucially depends on its efficiency” (ibid.) but it is easy to argue that funding the transition is a very efficient use of public money.

Besides these points, there are other important reasons that suggest public authorities should lead the funding of transition. First of all, pollution and climate change do not affect countries and people in the same way. There are very different interests and visions on the issue as it is clear during related negotiations (Kyoto, Paris, etc.). Only the States can find fair solutions to these different needs. Financial markets are rightfully not interested in the issue.

Secondly, financial markets are ruled by institutional investors that are not in the business of long-term investment: "To exaggerate only slightly, *there are no long-term stockholders anymore*" (Crotty, 1990). If other business opportunities come out, private investors could withdraw at least partially their support to the transition while the overhaul of productive system connected to the transition requires a stable flow of investment for decades, nor it is thinkable to raise yields of transition-related financial assets to retain private investors.

Thirdly, there is a general economic reason why it is totally implausible that a sufficient amount of resources will be mobilized privately. Climate change is a pervasive negative externality and therefore it entails a deep price distortion of most of goods (financial products included) having an international market. Carbon taxes and other well-known fiscal tools are important. Also taxation based on the "polluter pays" criterion is useful in order to incorporate environmental externalities into price-setting mechanisms, as indicated in the Declaration of Rio de Janeiro Conference on Environment and Development (1992)[14]. However, market tools are not enough to fund transition and to change the productive processes in the scale and speed needed.

Moreover, transition means a wider use of renewable energies. Given that the sun or the wind are not owned by anyone, differently from oil and gas, this could hamper the transition. This is the problem behind the discussion of the Coase theorem. Unclear property rights are another good reason to rely on public investment.

Waiting for this public commitment, "Currently, the EU is not on track to deliver the €11.2 trillion required to meet its 2030 energy policy targets. The latest estimates put the annual investment gap at around €177 billion between 2021 and 2030, totalling €1.77 trillion" (IR, p. 13).

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[14] In particular, according to the principle 16: "National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment" (http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm). On the application of the "polluter pays principle" to the general issue of environmental taxation, see Serrano, 2007; for an application to the Italian scenario, see Molocchi, 2017.

This gap will not be filled voluntarily by private investors unless their return and (implicit) public guarantees on the investment are very high. All in all, transition requires an alternative path, with a strong direction in the strategy of public intervention, able to deeply change the economic landscape in the production strategies.

5. Conclusions: what is missing? How to take transition seriously

> *Halfway measures simply delay the inevitable disaster* – Laudato Sì', Pope Francis

The green transformation of industrial production and of the economy as a whole will be one of the most important trends of the century. Everybody formally acknowledges it, in particular EU institutions, but as we observed, they are not willing to draw the consequences from it, although they have at least formally proposed a structured framework to deal with the transition.

As far as theoretical aspects are concerned, EU framework's contradictions are linked to two main points: which role for the State vis à vis the markets and, connected to the first, the short vs the long term. Before the crisis, in mainstream economics the State was bad: public investment, public rules, economic policies were useless relics of the past. Laissez-faire the financial markets was the name of the game. After financial markets were saved by public resources for trillions, the appraisal has become more balanced. But although now public investment is cool again, the point is the different role of public vs private funds. For instance, transition is a very uncertain business and institutional investors dislike uncertainty. Not by chance in Europe a pioneering role has been played by public banks: "The first ever green bond was issued by the European Investment Bank (EIB) in 2007; between 2010 and 2014, as the largest climate financier globally, the EIB provided more than €90 billion for climate action projects" (IR, p. 11). The same is true for the ESFI but their bond issuing is still low.

At the same time, the EU Reports point out that the scale of the interventions is beyond the capacity of the public sector alone. However, this is not a "factual" statement as we observed. For instance, the ECB has expanded its assets by more than €2 trillion due to the QEs. No one has predicted this expansion before the crisis. Was the bailing-out of the

European banking system “beyond the capacity” of the public sector? It is the importance of the goal that decides the commitment of public sector resources. Avoiding a financial meltdown was evidently considered important enough. The relative weight of public and private funds is therefore a political decision and the same is true for the use of these funds. It is clear from the EU Reports that public investment will be used for the Juncker Plan (infrastructures) “with a particular focus on the ‘Central and Eastern Europe’ macro area – since that area accounts for the majority of the infrastructure investment gap” (FR, p. 38). The general idea is that public fund will prepare the road for private investment: “Public support could be key to further foster a societal move to adopt sustainable clean technologies”, (Boulatoff and Boyer, 2017). Therefore, public funds will be used to improve the productivity of the German industrial backyard, or to test new technologies until they are profitable. After all, we are dealing here with negative externalities, and therefore we know that private investors will under-invest in the sector unless there are public incentives. This is the very typical public-private partnership and unfortunately transition is not going to be used to change the situation.

It is interesting to note that here and there in the International Reports there are hints of a different perspective. For instance, in the UNFCC Document on the Adoption of the Paris Agreement we can read of “non-market approaches to sustainable development” (2015, p. 6). Moreover, it is widely acknowledged that transition implies a redesign of a far wider social context starting from inequality. The same document states: “Emphasizing the intrinsic relationship that climate change actions, responses and impacts have with equitable access to sustainable development and eradication of poverty” (p. 21). The fight against climate change is also a fight against poverty. We can find the same analysis in the FAO appraisal of climate change (FAO, 2017, Ch. 4) and it quantifies investment needed for low-income countries in roughly 2 percent of global GDP (2017, p. 126). Lacking any viable alternative, the only way to find these resources is giving incentives to private investors, as it was done to give low-income Americans a house, thus giving roots to the subprime bubble.

In a nutshell, if financial markets rule the roost in sustainable finance, they will mold it according to their features. This means, above all, short-termism. The IR (p. 5) states correctly: “In the aftermath of the

financial and sovereign debt crises, sustainable finance could provide the best opportunity for the EU to reorient its financial system from short-term stabilization to long-term impact" but how can it be done if financial markets are left in command?

EU Reports are aware of this contradiction. For instance, we can read: "Reflecting these concerns, building a fairer Europe and strengthening its social dimension have become a priority for the Commission" (FR, p. 85). The problem is that the statement comes from the institutions that, for instance, imposed a draconian austerity to Greece. What kind of "social dimension" has been worked out for the Greek population? We can sum up the situation concluding that those Reports show a considerable level of confusion. We can read: "The financial system should be a vehicle for promoting these objectives by embedding social and other sustainability considerations into capital allocation, and by promoting more socially sustainable approaches to finance" (ibid.) but also "Sustainability cannot develop in a context where investment is dominated by short-term considerations" (FR, p. 45). Which one, then, is the political road to be pursued?

We see the discussion wandering among layers, that is, between helping the creation of new financial products and proposing? A different role for finance. At the core of the matter, the point is governance, that is a different balance of forces between the State and financial markets, or -to be more direct- how to avoid governments taking orders from big banks. Financial re-regulation after the crisis will not change it. Although many new rules go in the right direction (especially as far as liquidity risk and macro-prudential supervision are concerned), as we noted the overall business model of big banks has not been seriously affected (CFGS, 2018). Sustainable finance could be the last chance to regain public control of financial markets, but the chance is being dissipated. The fulcrum of the contradiction we are analyzing is that a political issue is treated as if it was a technical problem. For sure, pollution and climate change in particular have a very sophisticated technical aspects to be dealt with, but the core choices are political and must be taken democratically. The problem is that democracy is uncertain in its results and, as we noted, uncertainty is bad for financial markets. Technocracy is more reassuring: let the experts decide, they know what to do, citizen participation is not needed, we only need "ecological modernisation" governed by technocracy and big business

(Cadman ed., 2013, p. 18). The overarching role of technocrats, starting with central bankers, is the political side of financialization and the rule of financial markets on world economy. Once again, nothing lets us suppose that sustainable finance will be able to significantly change the situation.

EU Reports are full of good intentions, but good intentions are not enough. Transition is immensely important for the future of humankind. A total change in the financial landscape implies a strong guide in the strategy of public intervention, which should be based on new rules, different behavior and a different general attitude towards the environment. Either there is a serious commitment to transition -which will imply major changes- or it stays only a formal gesture -and the threat of climate change will not be dealt with as it should. When humankind realizes this, it could be too late.

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