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What role for financial regulation to help the low-carbon transition?

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The Institute for Climate Economics (**I4CE**) is a think tank with expertise in economics and finance whose mission is to support action against climate change. Through its applied research, the Institute contributes to the debate on climate-related policies. It also publicizes research to facilitate the analysis of financial institutions, businesses and territories and assists with the practical incorporation of climate issues into their activities.

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Executive Summary

Given the urgency of the fight against climate change, there has been a mounting pressure on financial institutions to better finance the transition to a low-carbon economy. Already in 2015, the Paris Agreement was calling for "making finance flows consistent" with the low-carbon transition. At the same time, financial regulators have become increasingly concerned by the climate risks that financial institutions are facing and consider it is time to address them.

The objective of the report is to look at the role that financial regulation should play to contribute to an effective alignment of the private financial sector with the Paris Agreement's objectives.

The insufficient financing of low-carbon transition by the financial sector

There is still an important financing gap between the financing needs of transition and the current level of financing supporting this transition. Public finance will not have the capacity to fill this gap and the private financial sector has an important role to play.

Over the last decades, numerous bottom-up initiatives of financial actors have been taken to promote 'responsible investment' and 'sustainable finance'. And it is indisputable that Green/Sustainable Finance has rapidly developed and has been progressively taking more ambitious objectives. But it is also fair to acknowledge that the impacts on the financing of low-carbon transition are far from being at the level that is required by the fight against climate change. In short, the greening of the financial sector through bottom-up market initiatives has been "too little and too late".

Several factors explain this situation:

- they relate first to the real-economy environment: lack of clear and stable policy orientations vis-à-vis low-carbon transition, climate externalities preventing a proper pricing and the lack of green projects to be financed;
- but other factors are related to financial sector market failures which are particularly detrimental to transition financing: financial actors short termism, constrains coming from fiduciary responsibility and the lack of adequate financing instruments.

Thus, the conclusion is clear: without a conducive investment and policy framework, the financial sector will not be able to smoothly finance the low-carbon transition.

The key role of financial regulation against climate change

Against this background, financial regulation should play a role in helping the financial sector to swiftly address climate change challenges. The question is what could be the objectives of using financial regulation to support the financing of low-carbon transition, with which instruments and timeline?

Regarding the **traditional objectives of financial regulation**, *i.e.* proper market functioning and financial stability, **there is now a broad consensus among financial regulators that climate change needs to be integrated into the regulatory framework.** Indeed, there are compelling reasons to support this position:

- Among the reasons explaining why market-led initiatives have been insufficient for financial institutions to fully tackle climate challenges, several directly fall in the remit of financial market regulation aiming at ensuring a proper market functioning: environmental externalities, market transparency, financial actors' short termism and fiduciary responsibility.
- Regarding financial stability, there are now numerous financial regulators considering that climate-related risks (physical, transition and liability risks) could potentially endanger the stability of the financial sector. And in many jurisdictions, it is acknowledged that financial regulators and supervisors can address climate risks within their current financial stability mandate.

On the contrary, **there is still a dissensus as to whether financial regulation should also be used as an economic policy instrument**.

Ensuring a proper market functioning (*e.g.* through disclosure and reporting) and reinforcing the resilience of financial actors (*e.g.* through a better assessment of climate risks) indirectly helps channel financial flows toward green activities which tend to be, on average, less risky and more profitable on the medium-long term than brown activities. However, this indirect impact might be seen as insufficient in the context of urgent action needed against climate change. Therefore, the question is whether financial regulation could and should also have macro-policy objectives such as channeling financial flows away from brown activities toward green ones.

This is quite a controversial debate. But several elements justify carrying on this discussion:

- Financial regulation has already been extended into policy areas in many developed countries (notably consumer protection and financial inclusion);
- Financial regulation might currently have unintended consequences on the financing of low-carbon transition (*e.g.* higher capital requirement for long-term credits under Basel III agreement) which need to be corrected;

- The existence of climate externalities and financial market failures might justify financial regulation to be used to tackle climate change. There are various examples of such policies in emerging market economies. However, in developed economies central banks and financial regulators typically consider that financial regulation should not be used to substitute or compensate the weaknesses of economic policies and environmental regulations.

A variety of regulatory instruments are available to integrate climate change challenges

These instruments can be regrouped in 6 categories:

- Increase financial actors' **awareness** and help understand the implications of climate change (*i.e.* signaling to the financial sector, engaging with financial actors, setting supervisory expectations, carrying research on climate-related risks);
- Ensure **disclosure** of environmental and climate-related information in a meaningful and comparable way for both non-financial corporates and financial institutions;
- Integrate climate change into **fiduciary responsibility** to expand the concept of 'fiduciary duties' beyond the short-term maximization of financial returns;
- Strengthen **micro-prudential stability** by reinforcing climate risks management and individual actor's resilience. For instance, for banks, this could mean integrating climate-related risks into prudential regulation – Pilar I (such as capital requirements, leverage ratio, liquidity requirements or prudential credit rules). In addition, climate-related risks could be integrated into Pilar II tools, notably the Supervisory Review Process (*e.g.* through the implementation of climate stress tests carried out by banks);
- Safeguard **macro-prudential stability.** This could require using new macro-surveillance instruments such as climate macro stress tests. But it could also require using regulatory tools, either micro-prudential tools (*e.g.* conservation capital buffer, caps on loan-to-value ratio) or specific macro prudential tools (*e.g.* Countercyclical Capital Buffer or sectoral exposure rules);
- Promote **investment allocation** according to economic policy objectives through various instruments: State-directed Priority Sector Lending program (*e.g.* India), incentive schemes (*e.g.* Bangladesh), Sectoral Credit limits, Green Finance Guidelines (*e.g.* China) or National Sustainable Finance Roadmaps.

In the report, we review these instruments and identify the implementation challenges and necessary pre-conditions to use them.

Implementation challenges and priorities for integrating climate change into financial regulation

The discussion on how to integrate climate change into financial regulation should consider several aspects.

Regarding the **traditional objectives of financial regulation**, two points need to be highlighted:

First, it is necessary **to use both the tools to improve transparency and disclosure** (market discipline) **and those to enhance financial stability** (prudential regulation). Improving climate-related information disclosure provided by corporates and financial institutions is key and several ways exist to strive for meaningful and comparable disclosure. However, better disclosure will not suffice to make the financial sector finance the low-carbon transition. Regulatory provisions should encourage financial actors to use climate related information into their governance and risk management process.

Second, **fully integrating climate-related risks into financial regulation will take time**. It is therefore key to differentiate regulatory tools which should be used in the short-term from those which need more time to be implemented.

- The measures that could be taken in the short-term (e. g. increase awareness, set supervisory expectations, enhance disclosure, strengthen the supervisory process) should be prioritized and initiated without any further delay. They can be carried out at the national level when there is no European or international benchmark. However, for some of them (*e.g.* enhancing disclosure), cooperation between supervisors is necessary.
- Some regulatory measures should be among the priorities of supervisors but are not ready yet to be implemented. For instance, climate stress-tests are only being developed by a few leading supervisors who are still at the initial development stage.
- Other measures will need more time. More challenging is integrating climate-related risks into rule-based prudential regulations such as banks' capital requirements. This will require widely accepted risk metrics and robust risk assessment methodologies to address the 'radical uncertainty' of climate change (and the associated lack of historical data) as well as some level of international cooperation to implement them (at least at the European level).

The report provides a tentative timeline for regulatory actions.

The use of financial regulation for allocating investments is far more controversial, at least in developed economies. To a large extent, it raises questions which are as much "political" as 'technical'. In order to make the debate going forward, it is necessary to address a series of questions:

- What is the **rationale** for using financial regulation to target economic policy objectives? The idea that financial regulation should substitute to appropriate economic and fiscal policies is very debated. Instead, the right question might be whether financial regulation could usefully complement economic policy measures to address specific market failures.
- How could potential **conflicts of interests** between traditional objectives (*i.e.* proper market functioning and financial stability) and policy objectives be tackled?
- Should financial regulator **mandate** be modified to allow them to follow economic policy objectives in addition to traditional ones? Contrary to some emerging economies where the central bank has in its mandate promotional objectives (including sustainability and climate change), the room for maneuver in financial regulators' mandates of developed economies to use regulatory measures to channel financial flows toward transition needs to be assessed on a case by case basis.

This is clearly a domain for further research in order to better inform this debate.

The report does not aim to recommend specific measures versus some others. It aims to clarify the challenges at stake, describe the expected outcomes and implementation difficulties of available regulatory instruments and stress the short-term priorities for financial regulators. The report has identified several regulatory areas which will require further research.

WHAT ROLE FOR FINANCIAL REGULATION TO HELP THE LOW-CARBON TRANSITION?

3 Objectives of Financial regulation	6 Categories of instruments	Several Expected impacts on low-carbon transition
TRADITIONAL OBJECTIVES PROPER MARKET FUNCTIONING FINANCIAL SECTOR STABILITY	**1. INCREASE AWARENESS**	
	1.1 Signaling	Increase awareness of financial institutions' governance.
	1.2 Supervisory Engagement	Initial assessment of climate risk exposures and monitoring by FIs.
	1.3 Research	• Initial assessment of sectoral climate risk exposure; • Financial regulators to contribute to the collective learning curve.
	2. ENHANCE DISCLOSURE	
		• **Non-financial corporates:** help correct market failures; • **Financial institutions:** enhance market discipline.
	3. INTEGRATE CLIMATE CHANGE INTO FIDUCIARY RESPONSIBILITY	
		Lead asset managers and asset owners to integrate climate change in their investment decision process.
	4. ENSURE MICRO FINANCIAL STABILITY	
	4.1 Pilar 1 - Bank prudential rules	Banks to integrate climate risks into their risk management systems and increase their resilience.
	4.2 Piliar 2 - Climate stress tests and supervisory review	• Banks to assess their resilience vis-à-vis climate change under stressed scenarios; • Allow banks' supervisory review to integrate climate change risks; • Provide forward looking scenario analysis.
	5. ENSURE MACRO FINANCIAL STABILITY	
	5.1 Macro testing	Assess potential systemic risks resulting from climate change.
	5.2 Countercyclical capital buffer	Enhance banks' capital to mitigate the build-up of systemic risk and reinforce bank's resilience to systemic risk.
ECONOMIC POLICY OBJECTIVE	**6. CHANNEL CREDIT FROM BROWN TO GREEN ACTIVITIES**	
		• Help financial players to be aligned with the transition to a low carbon economy; • Incentivize allocation of capital on green activities.

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Introduction

The sense of urgency regarding the fight against climate change is rising. Civil society has been mobilizing to put pressure on governments and corporates to take actions. All stakeholders are increasingly turning to financial institutions, both public and private, to fill in the investment gap. At the same time, financial institutions need to prepare themselves to adapt to climate change challenges. Most financial regulators are increasingly concerned by the risks financial institutions face due to climate-related risks and consider it is time for financial institutions to address these challenges. In the absence of appropriate transformation and adaptation, the financial sector will not be able to play its expected role in a smooth and efficient way.

In this context, this report analyzes one key dimension to help finance the transition toward a low-carbon and resilient economy: what role should financial regulation play to contribute to an effective alignment of the private financial sector with the Paris Agreement?

In 2015 when the UNEP Inquiry published its first report[1], the priority was to convince financial regulators that they needed to consider climate-related risks. Many events have happened since then (the least of which being the Paris Agreement) and today the majority of the supervisory community is convinced (as demonstrates the rapid growth of membership of the Network For Greening the Financial System) and has started to take action. The question regarding the role of financial regulation has thus changed in nature: the issue at stake is no longer to involve financial regulators, but to determine to what extent they should intervene, to clarify the objectives they should pursue, to review the regulatory and supervisory tools which are available, and to assess the challenges ahead for implementing them.

The report addresses these questions, taking into consideration the issue of time horizon: given the urgency, actions need to be taken rapidly. Therefore, it is crucial to differentiate between the actions that financial regulators could take in the short term - building on relevant experiences and practices - and the issues which will need to be addressed over a longer period.

Financial regulation is too often considered as too a complicated and technical issue to be in the public debate. As such, the report aims to clarify the stakes and the challenges to address in order to facilitate the public debate; it aims to provide public and private decision markers with analytical insight to feed the dialogue going on between all stakeholders on financial regulation[2].

It focuses only on the transition toward a low-carbon and resilient economy (mitigation and adaptation), noting that this will occur as part of, but putting the broader ecological/ environmental transition aside for the time being.

The report is organized as follows. Section 1 shows that the financial sector is insufficiently financing the low-carbon transition and looks at why the market-led approach has not been fully successful so far. Section 2 discusses the key role of financial regulation to support the financing of the transition and highlights differences between emerging market and developed economies. Section 3 describes the regulatory instruments which are available and looks to what extent they could be made 'greener'. Section 4 presents the challenges and priorities to integrate climate change into financial regulation.

1 UNEP Inquiry, "The Financial System We Need: Aligning the Financial System with Sustainable Development."
2 The report was drafted as a contribution to a European project funded by Climate KIC to help develop the network of Financial Centres For Sustainability (FC4S). It aims to help these centres to assess their situation and develop their strategy

1. The financial sector has insufficiently addressed low carbon challenges

It has long been recognized that 'finance' had a role to play in the transition toward a low-carbon economy. This was confirmed and reinforced in the 2015 Paris Agreement that set a specific goal for country parties on finance among its 3 overarching objectives in Article 2 (c): "Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development". While the goal may appear quite general as it refers to financial flows without any more precision, this broad scope simply reflects the reality that all financial flows need to be made 'consistent' given the magnitude of the existing gap of financing including the necessary rebalancing from 'brown' activities to 'green' ones. In addition, the variety of financing needs will require mobilizing both public and private finance.

The need for private finance to support the low-carbon transition is largely agreed upon now, at least in Europe. And private financial players have every reason in theory to do so: accompanying their clients, finding new business opportunities, following their Corporate Social Responsibility and Responsible Banking or Investment commitment, protecting their reputation and, finally, adequately managing climate-related risks. Still, the financial sector has not been so far up to low carbon challenges.

1.1. The existing financing gap of the low carbon transition

A variety of calculations have been made regarding the financing needs to support the low-carbon transition. Among those, one may note:

- The European Commission estimated in June 2019 that the yearly additional investment necessary to achieve the EU's climate and energy targets by 2030 amounted at EUR 260 billion[3].
- In its 2018 report[4], the Global Commission on the Economy and Climate estimated that the overall global investments for infrastructure will amount to USD 90 trillion up to 2030, more than the outstanding amount as of today. The challenge regarding climate change is to make these infrastructures sustainable.
- In its 2014 report, the Intergovernmental Panel on Climate Change - IPCC evaluated at €5.410 million the total amount of investment needed every year to reach a 2°C pathway. In the 2018 report on 1.5°C, the yearly investments in the energy sector alone were estimated at USD 2.38 trillion (mean value).
- The Global Commission on Adaptation[5] considers that the annual cost of adaptation will be in the range of USD 140-300 billion by 2030 according to the best available estimates.[6]
- According to HSBC, the world needs to invest $6-8 trillion per year by 2030 to keep the global temperature rise below two degrees Celsius, while current levels only amount to $1 trillion per year at the very best.[7]

Countries have committed to address climate change and public finance has an important role to play to meet these significant estimated investment needs and these are for the climate component of sustainable development alone. In developed economies, public finance – national government, public companies, domestic public financial institutions, local authorities – is key to finance public infrastructure projects as well as private projects which need public support to attract financing. For instance, in France public financing covered or helped drive almost 50% of the total of the "climate investments" in 2018[8]. In developing economies, the Multilateral Banks and other Development Financial Institutions as well as international funds (*e.g.* Green Climate Fund) have a key role to play to both mobilize domestic and international sources of public and private capital.

But, the need for mitigation and adaptation concerns also private activities (businesses, households). They should be mainly financed by the private financial sector given their magnitude and significant increase. Therefore, private finance must be mobilized as well.

1.2. The role of private finance

If there is no doubt as to whether the private financial sector has an important role to play in both shifting finance from non-Paris Agreement consistent activities[9] and in turn providing additional financing to support the low-carbon transition, there is still a debate regarding the type of role it is expected to play.

The traditional approach regarding the role of private finance vis-à-vis the real economy considers that financial actors have a somewhat passive role: they respond to the demand

3 European Commission, "United in delivering the Energy and Climate Action – Setting the foundation for a successful clean energy transition" COM (2019) 285 final
4 The New Climate Economy, "Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times."
5 GCA -UNEP FI, "Driving Finance Today for the Climate Resilient Society of Tomorrow."
6 UNEP, "The Adaptation Finance Gap Report."
7 Klier, "Green finance is still stuck in the slow lane after New York Climate Week."
8 Hainaut, Cochran, and Maxime Ledez, "The Landscape of domestic climate investment and finance flows."
9 I4CE has proposed a framework for defining activities 'aligned' with the Paris Agreement in Cochran & Pauthier "A framework for Alignment with the Paris Agreement: why, What and How for Financial Institutions?"

of financing expressed by the real economy (corporates, households, public entities). In turn, financial actors (banks, asset managers, institutional investors, insurance, etc.) should provide financing under different forms of products and services (*e.g.* loan, debt instrument, equity, underwriting, guarantee). Under this approach, financial flows respond to the demand expressed by the real economy. Therefore, the role of the financial sector is demand driven - to finance green activities or projects (*i.e.* activities and projects which are consistent with a pathway toward a low-carbon economy) which need financing.

However, one key aspect of financing low-carbon transition will be the necessary shift of financial flows from financing 'brown' activities (*i.e.* activities which are not consistent with the low-carbon transition) toward 'green' activities. The purpose is not only to increase low carbon investments, but also to decrease and progressively stop financing harming activities and help corporates to adapt to the transition. 'Shifting the trillions' does not simply mean stopping new financing of 'brown' companies and divesting from former 'brown' investment. In many cases, it will mean accompanying and financing corporates' transformation of their business from 'brown' activities toward 'greener' activities. In this regard, the financial sector is seen as playing a very different role in going beyond demand-driven activities to accompanying real-economy actors in the transformation of the economy.

There are diverging views on the extent to which the financial sector should play these different roles in financing a low-carbon, resilient economy. Does the financial sector simply wait for the real economy demand of 'green financing'? Or should it be more proactive and exert active pressure on corporates to push them to align their activities with the Paris Agreement objectives[10] such as for example the Climate Action 100+ initiative[11] or the development of 'sustainable instruments' linking financing conditions to ESG performance?

1.3. The development of 'Sustainable' Finance through market initiatives

Over the last decades, numerous private and public bottom-up initiatives of financial actors have been taken to promote 'responsible investment' or 'sustainable finance'. Increasingly, the support for low-carbon resilient transition is seen as a front-runner issue of the broader sustainable finance discussion. The most recent initiatives came up at the UN Climate Action Summit in New York in September 2019 (*e.g.* 130 international banks committed "to act for the achievement of the Paris Agreement goals" or investors gathered in the Net Zero Asset Owner Alliance committed that "by 2050 it will move to carbon free investments and begin to make sure the companies in which they invest are lowering their carbon footprint" or the launch of the Principles for Responsible Banking).

Beyond these recent initiatives, Sustainable Finance has transformed itself in various phases over the last decades. For example, Schoenmaker[12] has identified three stages of sustainable finance (based on the type of value privileged and the time horizon chosen); the UNEP Inquiry report[13] presented 4 'waves' in sustainable finance based on the successive primary focuses of sustainable finance:

- Mitigating reputational risk (2000);
- Responsible investing/ Environment and social risk-based finance (mid-2000s);
- Sustainable finance/investing (from 2012);
- Sustainable and SDG aligned financial institutions (from 2015).

It is indisputable that Green/Sustainable Finance has transformed itself in the last decades towards taking on more ambitious objectives. This pathway has been marked by important milestones:

- Setting of principles: *e.g.* Equator Principles (2003), Principles for Responsible Investment (2006), Principle for Sustainable Insurance (2012), Principle for Responsible Banking (2019);
- Creation of coalitions or networks of private actors such as Carbon Disclosure Project, Global Sustainable Investment Alliance or Net Zero Asset Owner Alliance.

Although some of these principles or coalitions gather a very high number of participants and cover very large amounts of assets[14], there is a broad consensus that the resulting impact of 'Sustainable Finance' on the real economy is insufficient compared to the urgency of actions required by climate change. Most importantly, these impacts of Sustainable Finance on the financing of low-carbon transition are complex to measure and appear rather limited.

Green Bonds are a case in point. They have received a great deal of attention in the past decade and the total green bonds issuance has amounted to near USD 1000 billion.

10 A similar debate is taking place regarding corporate commitments toward ESG/CSR (*e.g.* Business Roundtable which released in August 2019 a Statement on the Purpose of a Corporation or the companies gathered in the UN Global Compact which committed at the UN Climate Summit in New York in September 2019 to manage their businesses for achieving the climate targets).

11 Climate 100+ is an investor initiative to ensure the world's largest corporate GHG emitters take necessary action on climate change. Launched in December 2017, the initiative assesses now the performance of 161 of the most emitters corporates and aims at facilitating structured engagements with corporates on climate change.

12 Schoenmaker, "A Framework for Sustainable Finance."

13 UNEP Inquiry, "The financial system we need: From momentum to transformation." 2nd edition

14 For instance, more than 2,000 institutions with an excess of $80 trillion in assets have now signed the Principles for Responsible Investment (PRI)

However, this is still less than 1.0 per cent of total cumulative global bonds issuances[15]. In addition, there is an on-going debate regarding their additionality. Another example is provided in the Report published in 2017 by the Asset Owners Disclosure Project -AODP[16] which shows that if 25% of investors invested in green assets, these ones only represented 0.5% of their portfolios. A final example relates to the Net Zero Asset Owner Alliance whose creation in September 2019 was much praised: a group of global asset managers with combined assets under management (AUM) of US$4 trillion committing to align their portfolios with 1.5ºC by 2050. While this is a positive step, the investors being currently involved represent only 6% of the assets managed by the top 400 global asset managers[17].

1.4. The limitations of the market approach to reach the needed level of ambition

Comparing the observable impacts of the Sustainable Finance agenda with the necessary level of transformation of the economy suggests that market-led initiatives alone are insufficient. Several works on infrastructure demonstrate that increasing the financing of low carbon and resilient infrastructure requires an appropriate investment and policy framework to be in place[18] [19]. The same conclusion goes for the financing of the low-carbon transition as a whole. Indeed, an appropriate policy framework needs to address the main obstacles to a smooth financing of the transition.

Several factors are very often put forward to explain this inability of the financial sector to achieve the 'greening' of its activities[20] [21] without public interventions. These factors can be gathered in 6 categories that span both the real-economy investment environment as well as the capital market failures that hinder the functioning of the financial system itself, and are particularly relevant to explain the transition investment gap:

Real-economy investment environment:

- **Lack of clear and stable policy orientations.** Governments have the responsibility to raise awareness and design a credible strategy toward a low-carbon and resilient economy. They must implement the appropriate economic and fiscal policies to provide clear orientations and adequate incentives for economic agents to embark swiftly in the low-carbon transition. If there is a perceived lack of credible actions, the pathway that will eventually be taken is seen as uncertain and it will be then difficult for the private sector to take important decisions away from current activities toward new ones.
- **Market failures – Climate externality[22].** Economic activity often generates negative environmental externalities which arise from the lack of property rights for the majority of natural resources and environmental services provided by nature. Therefore, many economic agents contribute to climate change and generate negative impacts/costs on third parties without bearing these costs. The difficulty in pricing environmental externalities, positive or negative, make their integration into financial markets more complicated. As a result, environmental externalities are not properly taken into consideration by financial markets and associated risks are not correctly assessed and priced. Consequently, financial actors keep investing on 'brown' activities which will be riskier than deemed and less profitable than expected. On the contrary, 'green activities' suffer from unattractive risk-adjusted returns[23] (due to perceived high risks and/or small financial returns). In that respect, one may say that "the financial system is biased against green investments"[24]. Some of these environmental externalities can be internalized by private actors but others require some form of government intervention to be addressed.
- **Lack of green projects.** Last, a lot of financial actors complain about the lack of 'green projects' (and more specifically large enough projects as very often green projects are too small and so not attractive to investors or banks). In an economic world where money is abundant, financial actors argue that the problem is less that of a lack of money than a lack of good and profitable 'green projects'. Of course, some 'green projects' are not attractive enough given their level of risks and low profitability; these will need public support (guarantee and/or financial incentives) to become attractive. Others, however, are initiated in sectors where the level of maturity and profitability is high enough and should easily find financing. But the argument goes that a proportion of the private sector (notably SMEs and households) and the public sector (such as local authorities or municipalities) lack the awareness and technical expertise to develop adequate 'green projects'. This is all the more true when

15 IRENA "Renewable energy finance: Green Bonds" Brief 03 - January 2020 International Renewable Energy Agency, Abu Dhabi
16 AODP, "Global Climate Index 2017: Rating the world's investors on climate related financial risk."
17 Curran, Stern, and Robbins, "Climate ambition depends on finance and finance follows ambition - Grantham Research Institute on climate change and the environment."
18 Corfee-Morlot *et al.*, "Towards a Green Investment Policy Framework: The case of a low-carbon, climate-resilient Infrastructure."
19 OECD, The World Bank, and UNEP, "Financing Climate Futures: Rethinking Infrastructure."
20 UNEP Inquiry, "The Financial System We Need: From momentum to transformation." 2nd edition
21 Frankfurt School and UNEP, "Delivering the green economy through financial policy."
22 Another approach is to consider that climate is a public good or a common good and thus cannot be reduced to an externality. This approach leads to the conclusion that climate should not be left to the market even if better regulated.
23 Campiglio, "Beyond Carbon Pricing: the role of banking and monetary policy in financing the transition to a low-carbon economy"
24 Kapoor, "Internalizing climate mitigation for financial policy-makers. In Greening China's Financial System"

these projects concern adaptation (rather than mitigation) which is a domain less known by financial actors.

Capital market failures:

- **Short termism.** Anecdotal evidence and numerous studies[25] show that for most financial actors, even those who are investing on the long term, short term perspective prevails. There is a permanent pressure from financial markets to maximize short-term results; asset managers give priority to short term returns to meet financial market expectations. Short termism – which is not specific to climate change but is particularly detrimental to the financing of low-carbon transition- is another negative externality (often referred to the "tragedy of horizon" since Mark Carney's speech of 2015). There is also a general preference for short term and liquid assets[26] which is detrimental to many green assets. In addition, some features of financial regulation (Basel III for banks, Solvency II in Europe for insurance) may reinforce this preference for short term horizon (see discussion in section 3.4). The same may be said about some provisions of the international accounting standards (*e.g.* IFRS 9).
- **Fiduciary responsibility.** The vast majority of asset managers still consider that their main fiduciary responsibility vis-à-vis the asset owners is to maximize risk-adjusted financial returns. The debate has thus focused on the relative scale of returns of green/ sustainable investments compared to that of traditional ones. If there are strong arguments to expect a better risk-adjusted returns for sustainable investments in the long term, there is no compelling evidence that it holds true for shorter horizons of investment. Therefore, many asset managers claim they cannot go as far as they would like toward investing in green activities as they must deliver high (short term) returns. In the same vein, all financial actors feel the same constraint vis-à-vis their shareholders: even those supporting a Corporate Social Responsibility strategy (which takes into consideration all stakeholders), must give priority to the financial returns provided to their shareholders.
- **Lack of proper financing instruments.** This is the case to finance early-stage project development as the majority of 'Sustainable Finance' products often do not provide support to the early phase of project development. Typically, institutional investors are willing to become involved in infrastructure projects after planning and development risks have been managed. Therefore, there is a continued lack of interest and suitable financial instruments (such as risk sharing mechanisms) to help channel needed capital to early-stage project development and construction phases. But this is also the case for funding new technologies which require equity funding (coming from investors with a longer-term horizon) rather than bank lending (banks being concerned with funding intangible innovation with little low collateral value in case of failure)[27]. The nature of funding might matter beyond this innovation aspect. Thus, De Haas and Popov show that equity markets tend to better support the transition to a low-carbon economy[28]. Indeed, financial systems with higher equity market shares seem to better perform than other to decarbonate the economy.

The **figure 1** below summarizes the 6 reasons why the financial sector is unable to green its activities without public intervention.

It is interesting to mention that the relevance of these factors depends to some extent on the level of market sophistication. Most common barriers come across all markets (*e.g.* those related to real-economy investment environment) whereas others are more specific to advanced markets (*e.g.* those related to market development).

Nevertheless, all these factors help understand why Sustainable Finance – based on market-led and bottom up initiatives - struggles to have a strong impact on the channeling of financial flows toward a low-carbon and resilient economy. And at the same time, financial actors are accused of 'greenwashing' *i.e.* pretending that the impacts of their investment decisions are greater than they actually are. This accusation results partly from the lack of confidence on the very nature of green investments or products which support the need for green labels and taxonomies.

Although this bottom-up approach has an important role to play to mobilize and increase awareness of private actors, it is fair to conclude that it will not suffice to shift investment from brown to green activities and contribute to financing the extra investment needed in the timespan required. As Mark Carney put it, "like virtually everything else in the response to climate change, the development of a more sustainable financial system is not moving fast enough for the world to reach net zero"[29].

There is a need for a policy top-down intervention: without a conducive investment and policy framework, the financial sector will not be able to smoothly and efficiently finance the low-carbon transition. Against this background and given the importance of regulation for the financial sector functioning, there is a key role for financial regulation to play[30].

25 2° Investing Initiative and Generation Foundation, "All swans are black in the dark: how the short-term focus of financial analysis does not shed light on long term risks."
26 Kapoor, "Internalizing climate mitigation for financial policy-makers. In greening China's Financial System"
27 Luis de Guindos "Implications of the transition to a low-carbon economy for the euro financial system" Speech European Savings and Retail Banking Groupe Conference Brussels
28 R. de Haas and A. Popov "Finance and decarbonization: why equity markets do it better" Research Bulletin No. 64 ECB
29 M. Carney "TCFD: strengthening the foundations of sustainable finance" Speech - Tokyo TCFD Summit
30 UNEP Inquiry, "The financial system we need: From momentum to transformation."

1. THE FINANCIAL SECTOR HAS INSUFFICIENTLY ADDRESSED LOW CARBON CHALLENGES

FIGURE 1

THE LIMITATIONS OF THE MARKET APPROACH TO GREEN ITS ACTIVITIES

Source : I4CE

2. Financial regulation has a key role to play in addressing climate change challenges

As shown in section 1, bottom-up market initiatives will unlikely allow the financial sector to play its necessary role in supporting the low-carbon transition. The question is no longer whether financial regulation could play a role in supporting the financial sector to finance the transition. It is clear now it has a key role to play. Rather, the question is: what are the objectives to be pursued when using financial regulation against climate change?

We will first look at the traditional objectives of financial regulation and how climate change could be integrated in these objectives. We will then address the question as to whether financial regulation should go beyond its traditional objectives and pursue as well economic policy objectives regarding the fight against climate change.

2.1. The traditional objectives of financial regulation

There is no unique definition of **financial regulation** (see for instance the 'financial policy tools' defined by Krogtrup et al, the 'green finance policies' defined by Dikau and Volz or the 'financial market regulation' defined by the Frankfurt School-UNEP Center[31]). The report covers regulations which set rules and norms for financial actor behavior (banks, insurance, asset managers, institutional investors) and financial markets functioning (disclosure, transparency, fiduciary duty, etc.). It goes beyond the prudential rules to encompass all rules which have a bearing on financial actors 'behavior. It, however, does not cover regulatory measures relating to corporate governance or accounting. Nor it covers other policy instruments that have an impact on financial actors' decisions - such as monetary policy or economic policy instruments (fiscal policy, financial incentives, public investments, intervention of public finance institutions, etc.). Thus, the report tries to cover a broad definition of financial regulation (including that under central bank' s responsibility) but it does not cover all central bank's activities.

The report recognizes that different authorities across countries play the role of financial regulators and supervisors, setting the financial regulations as defined above and supervising financial institutions. Depending on the national policy framework that varies among countries, different institutions play this role – such as ministries of finance, financial market supervisors, bank and insurance supervisors and central banks in their capacity of regulator and/or supervisor. The interaction between these responsibilities and other responsibilities of these institutions (*e.g.* monetary policy within central banks) will not be addressed in this report (see **Box 1**).

BOX 1 - FINANCIAL REGULATORS AND SUPERVISORS

Financial regulators are the authorities setting the standards (not mandatory) or the regulations (mandatory):

- international level: several groupings play the role of international standard-setting bodies (Basel Committee for Bank Supervision-BCBS, International Association of Insurance Supervisors-IAIS, International Organization of Securities Commissions-IOSCO);
- regional level: at the European level, the Commission and the European Supervisory Authorities-ESA set the regulations. The ESAs are the European Banking Authority (EBA), the European Securities and Market Authority (ESMA) and the European Insurance and Occupational Pensions Authority (EIOPA);
- national level: different authorities are financial regulators depending on the national policy framework (*e.g.* ministries of finance, financial market authorities and central banks).

Financial supervisors enforce the implementation of financial regulations by supervised institutions:

- international level: there is no international body in charge of supervising financial institutions;
- European level: the Single Supervisory Mechanism (SSM) - the European Central Bank (ECB) in coordination with national supervisory authorities - is the European supervisor for banks. There is no European supervisor for financial market and insurance activities;
- national level: depending on the national framework, different authorities can play this role such as Ministries of Finance, central banks, single authorities or specialized authorities (for banks, insurance, market, etc.).

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31 Krogtrup *et al.* (IMF WP/19/185) ; Dikau and Volz ("Central bank mandates, sustainability objectives and the promotion of Green Finance" Department of Economics WP 232 SOAS University of London January 2020) ; Frankfurt School-UNEP Center "Finance Fit for Paris Tracker"

The traditional objectives of financial regulation are related to the response to market failures and so are based on the idea of maintaining the financial system's well-functioning. In a market economy, according to the classical economic theory, there is no need for public intervention except to correct market failures (see **Box 2**).

BOX 2 - THE THEORETICAL RATIONALE OF FINANCIAL REGULATION

The idea of obtaining market efficiency through the proper allocation of resources dates back from 1776 when Adam Smith developed the role of the "invisible hand" in the economy. According to Smith the market is driven by an invisible force which guarantees its well-functioning. Each individual allocates his capital in a way to obtain the best value in return, either in money or other goods, and so leads the industry to have an efficient production. By seeking always to increase their own profits, the individuals save and invest to obtain not only current, but also future benefits. In short, Adam Smith's theory claims that individuals have no intention of pursuing the interest of society but in the end, they promote public interest and make the overall economic system efficient [(a)].

Market economies are today theorized to function as if guided by the "invisible hand" on the basis of decentralized markets. Markets are responsible to set prices, wages, interest rates, and cost of finance contrary to the economies relying on centralized mechanisms (*e.g.* planification process). Within the current dominant doctrine of thought, in a market economy regulation and public intervention should be only used when **market failures** occur, *i.e.* when markets are not able to achieve by themselves the economically efficient outcomes.

Financial regulation is then a mean to correct the financial market failure resulting from asymmetries of information, negative externalities, public goods (positive externalities), imperfect competition and behavioral biases in consumer decision-making [(b)]. In recent history, the 'market failure' argument has supported the development of financial regulation to protect financial stability from a crisis-prone financial sector.

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(a) John Hartwick and Nancy Olewiler, *The economics of natural resource use*.

(b) John Armour *et al.*, *Principles of Financial Regulation*.

Financial regulation is then intended to correct market failures that could result in a financial crisis or other suboptimal outcomes. Financial regulation cannot prevent by itself all crises, but it aims at reducing their probability of occurrence and limiting their incidence and impact.

The traditional objectives of financial regulation can be divided into two major categories: proper market functioning and financial stability.

2.1.1. Proper market functioning

It includes transparency of information, efficiency of the market, investor protection, consumer protection, promoting competition and preventing financial crimes.

- **Transparency** means assuring that all information related to the stock exchanges is publicly available on a real-time basis. Regulation must guarantee information regarding bids and offers, and that prices as well as volumes of all transactions are made accessible to all players in the market. [32]
- **Market efficiency** needs being promoted by making sure that markets are informationally efficient. In other words, when all relevant information is publicly available, the market price functions as a timely and widespread present value of the firm's future revenues and all assets are being adequately valued by investors. [33]
- **Investor protection** is key for investors to invest in financial assets. Investor protection is obtained by giving investors proper and clear information regarding the potential risks they are exposed to and the expected rewards when making an investment. [34] Investors should also be protected by the regulation from any misleading, manipulative or fraudulent practice [35] ('conduct regulation').
- **Consumer protection** aims at protecting consumers (retail investors, deposit holders, insurance policy holders, etc.) from asymmetry of information in the market and the exploitation of their biases and misjudgments. [36]
- **Fair competition** is key for the market to function properly. Regulation must promote competition, for example by developing cross-border markets, ensuring the level-playing field among market participants or removing any anti-competitive practice. However, it must be recognized that regulation is often a barrier to entry and thus is also a barrier to competition.
- **Prevention of financial crimes** aims to prevent the financial system from being used to create negative externalities that harm society (*i.e.* using the financial system to hide assets from tax authorities or use of the system for terrorist means). [37]

32 IOSCO, "Objectives and Principles of Securities Regulation."
33 John Armour *et al.*, *Principles of Financial Regulation*.
34 John Armour *et al.*
35 IOSCO, "Objectives and Principles of Securities Regulation."
36 John Armour *et al.*, *Principles of Financial Regulation*.
37 John Armour *et al.*

In addition, financial regulation must consider the way **fiduciary responsibility** is defined. Fiduciary responsibility has not been historically defined by financial regulation. In Anglo-Saxon countries where it was born, it is mainly a civil law concept defined under the aegis of courts. However, it is becoming increasingly clear that it has an important impact on decisions made by investors when they have to balance different and potentially conflicting objectives.

2.1.2. Financial sector stability

Ensuring financial stability requests to address financial risks both at the institution and the system levels. Instability may derive from individual institution's failure occurring domestically or globally as the failure of one institution can generate a domino effect that affects the entire financial sector and may have impacts on the worldwide economy.

Ensuring financial stability thus requests two types of supervisory actions:

- **Micro prudential supervision:** financial regulation must aim at preventing individual institutions from failing (micro prudential regulation) by setting rules regarding the entry into the industry, governance and risk management, and prudential requirements (such as capital and liquidity requirements) in order to enhance individual institution's resilience in case of adverse shocks.
- **Macro prudential supervision:** regulation needs also to ensure the stability of the entire financial system. There was a twofold lesson drawn from the recent world financial crisis. On the one hand, individual supervision is not sufficient to ensure financial stability and needs to be complemented by macro prudential supervision to mitigate systemic risks. On the other hand, macro prudential supervision needs to be not only protective but also preventive to address systemic risks early on (see **Box 3**).

2.2. Introducing climate change in the traditional objectives of financial regulation

Historically, financial regulation has been designed at a time when climate change was not considered as a major challenge. Therefore, until very recently, it did not integrate climate change.

However, there are now compelling reasons to integrate climate change into the traditional objectives of financial regulation. The first one is that regulators' intervention could support and accelerate the integration of climate change challenges to preserve a proper market functioning given the insufficiency of the market-led bottom up approach on its own to provide enough financing to the low-carbon transition. The second one is that financial regulation should integrate climate-related risks to ensure financial stability at the institution level and the system-wide level. There is now a broad consensus in the financial regulatory community on the necessity to integrate climate-related risks.

BOX 3 - THE EXTENSION OF FINANCIAL STABILITY AFTER THE GLOBAL CRISIS

The 2007 financial crisis stressed the necessity to extend the financial stability approach from the micro to the macro prudential level in order to guarantee the whole financial stability. Prior to the financial crisis, it was considered that protecting individual banks from failing, and consequently ensuring market confidence and protecting financial system's clients, would entail financial stability [(a)]. However, "after the financial crisis it is widely recognized that the macro perspective was lacking." [(b)] Previously, systemic risk was mainly viewed as a contagion of a failure of one financial institution to the others. After the crisis, it was realized that financial institutions were as fragile collectively as they were individually, and so rational individual decisions might have a domino effect on the entire financial sector. Hence it was necessary to adopt a new macro prudential approach to sustain financial stability.

"This [new approach] should enable the relevant authorities to gain better insight into the development of imbalances, such as asset prices bubbles or vulnerabilities stemming from financial innovation, as well as the degree to which the financial system itself is capable of absorbing such shocks" [(c)].

The adoption of a new macro prudential approach after the crisis also included the introduction of time-varying aspects. Basel III, developed as a response to the crisis, requires regulators to have not only a protective but also preventive action towards the stability of the financial system. The new macro prudential measures should be forceful enough to avoid over heating in a certain sector, but sufficiently targeted to avoid harming the growth of the economy. Examples of preventive measures are the countercyclical buffer and capital conservation buffer [(d)].

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(a) John Armour *et al.*
(b) Schoenmaker, van Tilburg, and Wijffels, "What Role for Financial Supervisors in Addressing Systemic Environmental Risks?"
(c) Schoenmaker, van Tilburg, and Wijffels.
(d) John Armour *et al.*, Principles of Financial Regulation.

2.2.1. Support and accelerate the integration of climate change to ensure a proper market functioning

Among the reasons mentioned earlier to explain why market-led initiatives have so far failed to bring the financial sector to fully tackle climate change challenges, three directly fall in the remit of financial regulation:

Market failures need to be addressed if one wants the financial sector to play fully its role and, as already mentioned, this is a traditional rationale for setting financial regulation in a market economy. Environmental market failures are not any different and they require the intervention of financial regulators, for instance through disclosure and transparency regulations. Information asymmetries regarding climate-related risks also impact the financial flows to innovative environmental solutions and are one more reason put forward for an intervention to guarantee mandatory disclosure of climate related information.[38]

Short termism has an important bearing on the decisions made by financial actors, particularly regarding climate change whose horizon is medium and long term. Although one may argue that short termism has very numerous and diversified roots, it is clearly within financial regulators responsibilities to ensure there is an appropriate balance between short-term and long-term horizons when financial actors make their investment or management decisions regarding the low-carbon transition and the management of climate-related risks. This is also clearly their responsibility to ensure that prudential regulation is not unduly favoring short term investments at the detriment of useful long-term ones such as green investments.

Fiduciary responsibility is an important factor taken into account by asset managers when making their investment decisions regarding climate change as explained in Section 1. Therefore, it is now financial regulators' responsibility to ensure that climate change stakes are properly integrated by asset managers in their clients' interest.

2.2.2. Integrate climate-related risks into financial stability

A dramatic change has occurred since 2015 and notably in the last couple of years during which many developed economy financial regulators decided to make climate change a topic of concern and action. Indeed, financial regulators have come to realize that climate-related risks were a new source of risks for the financial sector which were threatening not only the safety of individual institutions but potentially the whole financial system stability.

Financial actors face three types of risks related to climate change:

- **Transition risks** come from the deep transformation that economic agents have to go through to adapt themselves to the low-carbon economy. This deep transformation will result in 'stranded assets' (*e.g.* fossil energy reserves which will not be exploited) and losses for the economic agents not prepared enough to face this transition which will in turn have negative financial impacts both on the assets or revenues of financial actors.
- **Physical risks** come from the occurrence of climate change related extreme (*e.g.* floods, droughts, typhoons) or chronic hazards (*e.g.* average heat increase, rise of sea level) resulting in financial losses for corporates, households or public entities and which may cause financial impact on the assets or revenues of financial actors.
- **Liability risks** come from litigation actions undertaken on the basis of climate change to engage the legal responsibility of corporates or public entities. These actions may result in financial costs for parties whose responsibility would be engaged. These liability risks which were initially considered in isolation tend now to be integrated into physical and transition risks.

The first major regulator to acknowledge the existence of these risks was Mark Carney, Governor of the Bank of England and Chairman of the Financial Stability Board, in a seminal speech before the Lloyd's in September 2015[39]. Following this bold statement, there has been a growing consensus to consider that financial regulation could help increase banks' resilience to climate-related risks and better stabilize the financial system. Thus, the Network for Greening the Financial System (NGFS) was created by 8 central banks and supervisors in December 2017. The NGFS considers that "*climate change may result in physical and transition risks that can have system-wide impacts on financial stability and might adversely affect macroeconomic conditions".*[40]

It is now clearly acknowledged in most jurisdictions that financial regulators and supervisors need to look at climate risks within their current mandate. One can even say that the financial stability mandate, strengthened after the world economic crisis, provides solid ground for financial regulators and supervisors to address the potential impacts of climate change on the financial sector.[41] This is no longer a question for debate. Still, we will see thereafter (Section 3.4.1) that the specificities of climate change make quite challenging the integration of climate-related risks into financial regulation. Chenet *et al.*stress that the 'radical' uncertainty of climate change makes impossible to assign probabilities based on historical data or hypothesized scenarios to measure the

38 Céline Bak *et al.*, "Toward a Comprehensive Approach to Climate Policy, Sustainable Infrastructure and Finance."
39 M. Carney "Breaking the Tragedy of the Horizon – climate change and financial stability" Speech at the Lloyd's of London
40 NGFS, "A call for action: Climate change as a source of financial risk."
41 Schoenmaker, van Tilburg, and Wijffels, "What Role for Financial Supervisors in Addressing Systemic Environmental Risks?" Sustainable Finance Lab working paper

exact level of climate-related risks[42]. In addition, standard risk tools and supervisory instruments face difficulties to capture the medium and long-term horizons of climate-related risks. This should lead to using scenario analysis and stress-tests.

The push for an institutional action to integrate environmental sustainability into financial regulation has thus progressively increased. It is important to stress that ensuring a proper market functioning (for example through disclosure and reporting) and reinforcing the resilience of financial actors (for example through a better assessment of climate risks) indirectly helps channel financial flows toward green activities which tend to be, on average, less risky compared to brown activities. However, this indirect impact might be seen as insufficient in the context of urgent action needed against climate change and given the prevailing strong externalities. Therefore, beyond the traditional objectives of financial regulation, the question is whether financial regulators should also have macro-policy objectives such as channeling the financial flows away from brown sectors toward green ones.

2.3. Going beyond traditional objectives: a debated change of paradigm

To achieve the transformative change towards a more sustainable economy and mitigate the impact of the climate change, governments have a variety of economic policy options at their disposal. Instruments such as environmental regulation (*e.g.* energy efficiency standards or climate-friendly building standards), carbon price, cap-and-trade system of emission allowances, fiscal policies (*e.g.* subsidies for green activities or elimination of subsidies to carbon intensive activities) have a key role to incentivize the market to engage toward the transition in changing current market decisions and customers' behavior.

The question is whether financial regulation could be used to support a rapid and structural change in the financial system to decarbonize the economy, as advocated by some authors[43]. Using financial regulation for pursuing economic policy objectives is quite controversial. It is regarded by some authors as "financial repression" and is associated with distortive side-effects. For instance, Jafarov *et al.*considers that financial repression distorts market functioning and induces losses from inefficiency and rent-seeking[44]. However, several elements justify to better inform the discussion.

2.3.1. The current extension of financial regulation into policy areas

There is a current debate as to whether financial regulation should integrate non-financial objectives (*e.g.* social objectives). The advocates of such a policy argue that we have already observed the extension of financial regulation objectives into policy areas. This is currently the case in many countries regarding financial inclusion and consumer protection which have still some links with financial stability. Moreover, there are examples of financial regulation being used as a policy instrument in some emerging market economies but also in some developed economies: these policies were rather frequent until the 1970s but some examples of support for specific sectors (notably small and medium size enterprises and real estate) are still in place (see **Box 4**).

Given these examples of extension, some authors wonder whether the urgency of action to fight against climate change provides a rationale for financial regulators and supervisors to be asked to go beyond their financial stability responsibility.

There are two main questions that need to be answered if such a more proactive approach is warranted.

42 H. Chenet *et al.*"Climate-related financial policy in a world of radical uncertainty: towards a precautionary approach" UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP-WP 2019-13)
43 Emanuele Campiglio *et al.*, "Climate change challenges for central banks and financial regulators" Nature Climate Change Vol 8
44 E. Jafarov *et al.* "Financial repression is knocking at the door, again. Should we be concerned?" IMF Working Paper/19/211

BOX 4 - THE OBSERVED EXTENSION OF FINANCIAL REGULATION OBJECTIVES INTO POLICY AREAS

The extension of financial regulators' objectives beyond financial stability has already taken place in some jurisdictions. The domains of extension depend according to national circumstances.

In many developed and emerging economies, objectives have been given to regulators beyond their financial stability mandate but in domains which have some links with financial stability[a]. For instance, Anti Money Laundering and the fight against Terrorism Financing (AML-FT) belong to the responsibilities of most financial regulators and supervisors worldwide. More relevant to this research are the examples of financial inclusion and consumer protection (for financial services) where the links with financial stability, although existent, appears less important. Indeed, regulators have been tasked with these responsibilities for fair competition objective as well as for social considerations. In the UK, the Financial Conduct Authority was created in 2013 with the overall objective of ensuring that financial markets function well; one of its 3 operational objectives is to protect consumers[b]. Another example is France where the Central bank has 3 main missions[c]: monetary strategy, financial stability and the provision of economic services to the community; as part of the last mission, Banque de France provides services to people in distressed financial situation (by handling cases of household over-indebtedness and giving access to basic banking services defined by the law). The French prudential supervisor for banks and insurance (ACPR) is also in charge of protecting the customers of the entities it supervises[d]. As a Cambridge report puts it: "the increasingly mainstream focus of banks and banking regulators on topics such as financial inclusion sets a precedent for greater involvement of financial institutions and their regulators in finding solutions to societal problems".[e]

Beyond, financial regulation has been used as a policy instrument in some emerging market economies. These were often "macro prudential quantitative policies aimed at mitigating systemic risk, giving central banks the capability of orientating credit creation towards the sectors considered as strategic for country development."[f] In other cases, we find examples of financial regulations designed to help allocate more credit to specific sectors (*e.g.* Green guideline in China or Risk management guideline in Bangladesh)[g].

But there are also examples of financial regulation being used as a policy instrument in developed economies. As U. Volz points out, "in fact historically, the central banks of most countries – including European central banks as well as the US Federal Reserve – have played a crucial role in economic development by supporting targeted sectors, be it industry or finance"[h]. These policies have been common until the 1970s and have then disappeared following the deregulation and monetary policy change that occurred worldwide in the 1980s. However, there are various examples of developed economy central banks still supporting the financing of specific sectors through various instruments [i][j]. These countries include the UK, Korea, Japan, USA and the European Union with the introduction of a SME Supporting Factor in banks capital requirements in 2014[k]. Benefiting sectors are often the SME sector and some segments of the real estate.

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(a) Penelope Hawkins, "Design Options for a Sustainable Financial Sector" Inquiry WP
(b) FCA, "Financial Conduct Authority (FCA)."
(c) Banque de France, "Les missions de la Banque de France."
(d) ACPR, "Présentation de l'ACPR."
(e) UNEP Finance Initiative, UNEP Inquiry, and University of Cambridge - Institute for sustainability leadership, "Banking & Sustainability -Time for Convergence: A Policy Briefing on the links between Financial Stability and Environmental Sustainability."
(f) Campiglio, "Beyond Carbon Pricing: the role of banking and monetary policy in financing the transition to a low-carbon economy" LSE Research Online
(g) Kapoor, "Internalizing climate mitigation for financial policy-makers."
(h) U. Volz "On the Role of Central Banks in Enhancing Green Finance" UN Inquiry WP
(i) U. Volz
(j) Kapoor, "Internalizing climate mitigation for financial policy-makers."
(k) Berenguer, Cardona, and Evain, "The integration of climate-related risks into banks' capital requirement."

2.3.2. Addressing unintended consequences of financial regulation

The first one relates to unintended consequences of financial regulation. The current financial regulation might discourage green finance due to investment limits, capital adequacy, liquidity requirements and other instruments which do not facilitate the funding of sustainable investments. Therefore, the question is whether regulators should address these possible unintended impacts?

Section 3 will provide examples of regulatory provisions (regarding the treatment of long-term credit for capital requirements) that are considered by some as having negative impacts on green investment. But these provisions have prudential background (*i.e.* higher prudential capital

is required on longer term credits given their higher level of historical default rate). Therefore, addressing unintended consequences may need to arbitrage between conflicting objectives.

2.3.3. Using financial regulation to directly channel financial flows towards low-carbon transition

The second much more far-reaching question is: should financial regulation be used as well as a policy tool to directly orientate financial flows towards a low-carbon economy?

Some authors consider that the existence of externalities and market failures request financial regulation to take on other objectives than their traditional objectives. We have already described in Section 1 environmental externalities and short termism of financial markets. Volz[45] or Campiglio[46] broaden the perspective by considering the provision of credit by banks to socially undesirable activities – such as carbon intensive or polluting businesses – as a credit market failure because of the misalignment between the private decisions of commercial banks and a society's development objectives. With an even broader perspective, Nicholas Stern considers that "climate change is the greatest market failure in human history"[47].

Since financial regulation is meant to address all market failures and given the urgency to fight against climate change, why should regulators not be required to intervene to reduce environmental externalities and help the system to achieve a higher social welfare and eventually social optimality?[48]

Today, this is a quite controversial question.

Developing and emerging economies, such as China, Brazil, Bangladesh or Indonesia, have already taken actions to integrate sustainability issues into financial regulation. Emerging economies often lack awareness, information and human capacity to establish voluntary environmental and sustainable development practices. Therefore, setting sustainable financial regulation ensures a level of sustainable practices for all players in emerging markets and supports collaboration and capacity development. Unlike industrialized countries, these countries usually receive financial support from international multilateral organizations and development finance institutions. When receiving external financial support, they have to comply with environmental conditionalities and sustainability guidelines aiming to transform their financial system into a more sustainable one, as occurred in Nigeria for example. Another motivation to make emerging economies' financial regulation more sustainable is the high environmental impacts of core industries. In Bangladesh for instance the absence of strict environmental policies to diminish investments on carbon intensive and polluting activities raised the need to use financial mechanisms to support environmental-friendly practices. Other countries like Brazil, Colombia and Peru consider the creation of new business opportunities as the main driver to adopt a more sustainable financial regulation. Last, the adoption of sustainable practice regulations by one powerful economy may as well force a change on regional neighbors. This was the case of Colombia and Peru that saw a new opportunity for their economies when Brazil implemented guidelines and regulations to have a more sustainable financial sector.[49]

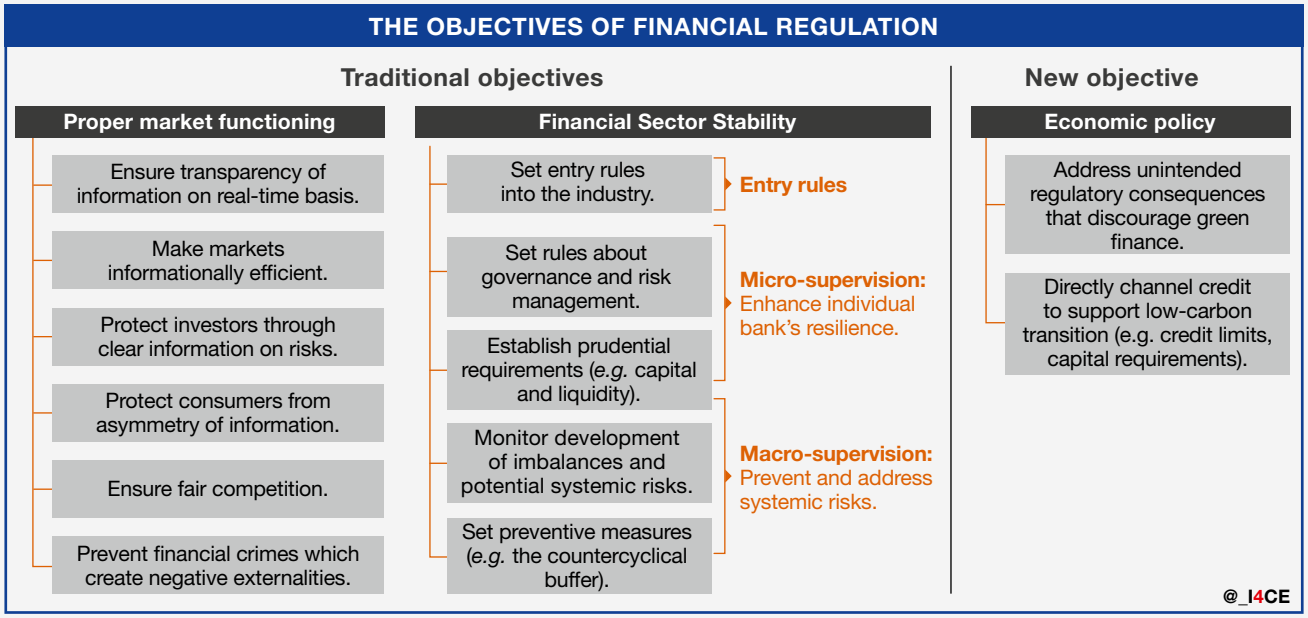
In developed economies, central banks and financial regulators typically consider that financial regulation should not be used to substitute or compensate the weaknesses of economic policies and environmental regulations. They believe financial regulation should support the efficient and sustainable allocation of capital, but not promote sustainable development.[50] They consider it is not within financial regulators' mandate and that such policy could create conflicting objectives. Thus, most regulators in developed economies strongly oppose such a change of paradigm in financial regulation, particularly that which could result in lowering prudential regulation requirements. As an example, DNB, the Netherlands' central bank, - which is nevertheless one of the leading central banks in integrating sustainable finance in supervision – stated in 2017: "*Like all other types of finance, green finance involves risks. Therefore, we believe that supervisory rules should not be relaxed to promote sustainable finance… We take the view that capital requirements must not be lowered to realize social objectives*."[51]

Overall, this section shows there is a strong rationale to integrate climate change challenges into financial regulation to pursue its traditional objectives (proper market functioning and financial stability) and at least an open debate as to whether financial regulation could also be used for economic policy objectives (see **Figures 2** - the traditional and policy objectives of financial regulation).

45 Ulrich Volz, "On the Role of Central Banks in Enhancing Green Finance."
46 Campiglio, "Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy,"
47 Nicholas Stern, "The Stern Review", Cambridge
48 Adeboye Oyegunle and Olaf Weber, "Development of Sustainability and Green Banking Regulations Existing Codes and Practices."
49 Adeboye Oyegunle and Olaf Weber
50 Adeboye Oyegunle and Olaf Weber
51 Regelink *et al.*, "Waterproof? An exploration of climate-related risks for the Dutch financial sector."

FIGURE 2

TRADITIONAL VS NEW OBJECTIVES OF FINANCIAL REGULATION



Source : I4CE

The following section will review the regulatory tools which could be possibly used in these different perspectives.

3. The available regulatory instruments to integrate climate change challenges

There are a variety of instruments available for financial regulators encompassing the functioning of financial markets at large and financial stability both at micro and macro levels (prudential regulations)[52] [53]. They differ by nature, ranging from raising awareness through supervisory practices up to regulations. These regulations can be soft, principle-based or rule-based regulations.

This continuum of supervisory actions and regulations must be considered globally rather than in isolation because they all aim directly at modifying financial actors' behavior and they interact.

The following description builds on several academic surveys (Dikau and Volz[54], D'Orazio and Popoyan[55]; Krogstrup and Oman[56]) and on supervisory experiences (IAIS-SIF 2018 Issues Paper[57] and NGFS 2019 first report[58]).

The scope of this section is the entire financial system; some instruments are available for all financial regulators, others are relevant to different financial sectors (banks, insurance, investment…). This is specified in the following developments.

3.1. Increase the awareness on climate change and understand its implications by research

The first available instrument at the disposal of **all financial regulators** is their capacity to frame the agenda in the financial industry. They can do so through several ways.

Signaling to the financial sector: First, it is a well-known reality - confirmed by academic research - that central banks and more generally financial regulators have a strong signaling power toward the financial sector: they have the capacity to draw the attention of financial actors' management when they talk about specific issues and express concerns. This applies for monetary policy but more broadly to all financial issues including tech innovation and cybercrime. Applied to climate change, it means they have the capacity to increase the awareness of financial actors on these issues. They can do so by acknowledging the materiality of climate risks[59]. In most cases, it is done though financial regulators' speeches, participation into conferences, regular publications, etc. It can also be done through the commitment of central banks to manage their own portfolios according to responsible investment principles with a specific focus on climate issues. Such commitments have an important signaling effect and therefore have been an important aspect of the NGFS work[60].

Engagement and Agenda Setting: Second, they can engage with the financial industry, with an impact on the prioritization of topics by the financial community (see **Box 5**). Using their supervisory position (even when they are not backed by hard regulations), they can engage dialogue and ask financial actors how they assess and address climate-related risks in their governance and management processes (through surveys or bilateral meetings).

In this respect, the involvement of financial regulators in OECD countries, initiated by the Bank of England, followed by a series of Governors' speeches and reinforced by the creation of the NGFS, a network of central banks and financial supervisors[61] willing to address climate-related risks, was a real game changer for the financial industry. Suddenly, climate change was no longer a question of reputation vis-à-vis green activists dealt by CSR departments, but a more serious issue taken on board by Risk departments.

BOX 5 - A SHORT HISTORY OF CLIMATE-RELATED ENGAGEMENT

Some emerging economy financial supervisors have started to engage with supervised institutions in the early 2010s (China is a case in point).

In several developed economies, bank or insurance supervisors have been actively engaging with supervised entities more recently in different ways:

52 Reserve requirements are not considered in the report, as these tools are primarily a monetary policy instrument. Although they are used in some emerging market economies as a macro prudential instrument, they should not be analyzed separately from the other monetary policy tools with which they interact.
53 The report does not address the facilitating role of financial regulators to address the problem of missing markets and the creation of new asset classes such as Green Bonds.
54 Dikau, Simon and Volz, Ulrich (2018) "*Central Banking, Climate Change and Green Finance*". ADBI Working Paper No. 867, Tokyo: Asian Development Bank Institute
55 D'Orazio and Popoyan "Fostering green investments and tackling climate-related financial risks"
56 Krogstrup *et al.*"Macroeconomic and Financial policies for climate change mitigation: a review of the literature" IMF Working paper 19/185
57 IAIS-SIF "Issues paper on Climate Change risks to the insurance sector"
58 NGFS "A call for action: climate change as a source of financial risk"
59 UNEP Finance Initiative, UNEP Inquiry, and University of Cambridge - Institute for sustainability leadership, "Banking & Sustainability -Time for Convergence: A Policy Briefing on the links between Financial Stability and Environmental Sustainability."
60 NGFS "A sustainable and responsible investment guide for central banks' portfolio management" NGFS Technical document
61 Central Banks and Supervisors Network for Greening the Financial Sector – NGFS created by Banque de France and 7 other entities in Paris in December 2017

- engaging a **supervisory dialogue** with supervised entities: *e.g.* in the UK (the Prudential Regulation Authority-PRA as from 2015), in Australia (Australian Prudential Regulation Authority-APRA), France (Autorité de Contrôle Prudentiel et de Résolution-ACPR) or in the Netherlands (De Nederlandsche Bank-DNB);
- running **pilot analysis** using internal data and communicating the aggregated results back to their constituency (*e.g.* California Insurance Commissioner, Swiss FINMA, Dutch DNB, UK BoE-PRA, European Agency EIOPA). Such pilots have a signaling and engagement effect; they also build up internal capacity and can prepare if deemed necessary informed regulatory changes;
- officially setting **supervisory expectations**. Some supervisors decided to do it through regulation. This is for example the case of the Prudential Regulatory Authority in the UK which issued in April 2019 a supervisory statement[(a)] to supervised institutions that set out 4 expectations regarding governance, risk management, scenario analysis and disclosure. These are still high-level principle expectations, but it is clearly a first step toward integrating climate-related risks into financial regulation. Other supervisors may consider they lack adequate legal ground to do so. However, even in such a situation, the soft-law approach can be used (*e.g.* the publication of report by supervisors on good practices observed among financial actors).

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(a) Bank of England, "Enhancing banks' and insurers' approaches to managing the financial risks from climate change."

Research and Expertise on New Topics: Third, financial regulators have generally at their disposal human and financial resources as well as technical expertise available to work on emerging issues well ahead of any regulatory change. As monitors of financial stability, they have the responsibility to address any topic relevant to the stability of the financial industry and devote resources to better understand it. Clearly climate change is a major issue they need to better understand. Doing so, they will help the financial community make progress.

In this respect, the first step can be an initial assessment of the extent to which one sector is exposed to climate-related risks (insurance, bank, etc.) through a survey (on governance, level of exposures, risk management systems, etc.). These surveys allow supervisors to better understand risks in the financial industry and financial institutions to be better aware of the existence of these risks at the system level[62]. One difficulty of these surveys is to aggregate data which are not necessarily consistent and have not been thoroughly checked by supervisors. In some cases, supervisors have built on these surveys to quantify the level of exposure of the financial industry or one specific sector (insurance or bank).

Another key topic that needs to be addressed by financial regulators including central banks is the methodologies and tools to help understand the climate-related risks and assess their economic and financial implications[63]. This task needs to be undertaken both at the macroeconomic level (by integrating climate change into macroeconomic models) and at the micro level (by helping develop methodologies fit to better assess climate-related risks at the actor level).

It is important to note that in most countries, financial regulators are many (Minister of Finance, central bank, bank supervisor, insurance supervisor, financial market supervisor, etc.). All of them have not necessarily the same level of awareness regarding the climate change challenges for the financial sector. It is therefore key to ensure that all of them are embarked and committed to act at the appropriate pace toward the right direction. There is also a need to develop new collaboration between financial regulators and other stakeholders (*e.g.* Ministry of environment, Environment agency, climate change experts).

3.2. Ensure disclosure of environmental and climate-related information

The second available instrument for financial regulators is the **disclosure** of environmental and climate-related information. In particular, **financial market regulators** have the possibility to set disclosure rules for all issuers (companies listed on financial markets and bond issuers) as well as information requirements for 'green' financial products (investment funds, Green Bonds, structured products, Green Securitization, etc.) which are proposed to professional investors[64]. **Other regulators**, such as banks regulators, have the possibility to set disclosure rules for a specific category of supervised financial entities (*e.g.* banks).

62 ACPR « Le changement climatique: quels risques pour les banques et les assurances ? » Autorité de Contrôle Prudentiel et de Résolution
63 Emanuele Campiglio *et al.*, "Climate change challenges for central banks and financial regulators.
64 Financial regulators can also set transparency rules for financial actors (insurance, banks, asset managers) to correctly inform their retain consumers.

The low level of awareness of investors and companies is still a challenge to achieve the transition to a low-carbon economy. In order to increase the awareness and help the market to have a better understanding of environmental and climate risks, it is highly important that non-financial companies, banks and investors provide to other market participants consistent and reliable information disclosure. In a survey conducted by Morgan Stanley of over 100 assets owners, 23% of the interviewed declared that the availability of quality sustainability data is their biggest challenge when adopting sustainable investment practices.[65] Ultimately, transparency could help the market improve the pricing of climate risks and integrate climate in its actions.[66]

Enhancing reporting and disclosure

The Task Force on Climate-related Financial Disclosures (TCFD), set up in 2015, aims to encourage the voluntary disclosure of climate-related risks and opportunities for corporates. The TCFD developed four main recommendations related to governance, strategy, risk management and metrics and targets, as a framework applicable to organizations across sectors and jurisdictions as detailed in **Figure 3**[67]. These recommendations are complemented by specific recommendations for the financial sector and the more exposed economic sectors (energy, transportation, agriculture, etc.).

FIGURE 3

RECOMMENDATIONS AND SUPPORTING DISCLOSURES

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organization's governance around climate-related risks and opportunities.	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.	Disclose how the organization identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
Recommended Disclosures	**Recommended Disclosures**	**Recommended Disclosures**	**Recommended Disclosures**
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	a) Describe the organization's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	b) Describe the organization's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

*Source : TCFD**

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* TCFD Recommendations of the Task Force on Climate-related Financial Disclosures

65 Morgan Stanley, "Sustainable Signals: Asset Owners Embrance Sustainability."
66 William Oman and Signe Krogstrup, "Macroeconomic and Financial Policies for Climate Change Mitigation: A Review of the Literature."
67 TCFD, "Recommendations of the Task Force on Climate-related Financial Disclosures."

In its June 2019 Status Report, although the number of signatories to its recommendations has been growing rapidly, the TCFD stressed key challenges associated with implementing the recommendations and expressed concerns "that not enough companies are disclosing decision-useful climate-related financial information"[68]. Thus, one may doubt this voluntary approach alone will be enough to improve the information flow and ensure market transparency. In particular, it is uncertain whether a voluntary approach will provide meaningful and comparable information.

At the national level, France has been a step ahead when compared to other developed economies in terms of disclosure requirements for corporates[69]. The Article 173-VI of the French Energy Transition Law (2015) was a major step forward: it requested financial investors to provide information regarding climate-related risks and their impact on climate change. If it has led to improved disclosure on climate change, it was based on 'a comply-or-explain principle' and significant effort remains necessary to reach comparable and meaningful disclosure (see for instance the assessment of the implementation carried out by I4CE[70] or by the French regulators and supervisors[71]).

The EU Commission updated in June 2019 the Guidelines on non-financial reporting to improve the reporting of climate-related information, notably to integrate the TCFD recommendations; however, these guidelines remain non-binding[72].

Climate disclosure is only a mandatory requirement in a limited number of emerging economies (India, Indonesia, Nigeria, Pakistan and Vietnam)[73]. As a result, in a large majority of countries, most companies do not provide sufficient information (*i.e.* when material) on how are their business models exposed to environmental risks. Thus, consumers and investors do not have access to transparent information to make optimal decisions. If the market fails to make this type of information public, there are strong reasons to consider that regulators should require such disclosure.

In addition, disclosed information must be comprehensive, meaningful and comparable between all market participants. Therefore, in addition to qualitative information (on governance, strategy, decision-making processes, etc.), some authors consider that a mandatory standard with well-defined and forward-looking metrics established by regulators could be a valuable instrument to avoid the proliferation of approaches with low quality, biased or misleading information[74]. It is also important to remember that disclosure of information needs to be done by all economic sectors. Some also expect central banks to disclose information on their portfolios[75].

Concerning banks, Pillar III of the Basel framework sets provisions regarding market discipline. CISL explains that Pilar III "largely relies on developing a set of disclosure requirements which allow market participants to assess relevant information about a bank's capital, risk exposures, risk assessment processes, and hence the capital adequacy of the institution". The paper concludes: "Pillar III's market discipline framework should be considered as another lever to enhance the bank's governance framework with respect to systemic environmental risks"[76].

Other instruments to enhance transparency

Beyond disclosure standards, there are other instruments which can improve market transparency, notably taxonomies and green standards or labels.

It is worth stressing that a common taxonomy allowing to differentiate 'green' from 'brown' activities is key in delivering meaningful and comparable disclosure (see **Box 6**). Although setting taxonomy is not part of financial regulation as defined in this report and rather belongs to the broader environmental policy, this is a topic that cannot be disregarded by financial regulators.

BOX 6 - TAXONOMY

A taxonomy is not a financial regulation tool per se but it is certainly a useful mechanism when adopting several of the instruments reviewed in this report.

A common taxonomy is a key element to have a meaningful and comparable environmental disclosure and to guide the choices of market participants to climate-friendly activities. Such a taxonomy sets minimum standards which allow financial institutions (FIs) to classify their assets according to their impact on the environment. The standards help FIs to

68 TCFD "Task Force on Climate-related Financial Disclosure: Status Report"
69 Initial non-financial disclosure requirements for French corporates were put in place early on, with the 2001 Law on New Economic Regulation and the 2010 Law on National Commitment for Environment ("Grenelle II")
70 J. Evain *et al.*« Article 173: Overview of climate-related financial disclosure after two years of implementation" I4CE
71 *« Bilan de l'application des dispositions du décret n°2015-1850 du 29 décembre relatives au reporting extra-financier des investisseurs » Juin 2019 Ministère de la Transition Ecologique et Solidaire, Ministère de l'Economie et des Finances, Autorité des Marchés Financiers et Autorité de Contrôle Prudentiel*
72 European Commission "Guidelines on non-financial reporting: Supplement on reporting climate-related information – Communication from the Commission Official Journal of the European Union
73 D'Orazio and Popoyan, "Fostering green investments and tackling climate-related financial risks."
74 Campiglio *et al.*, "Climate change challenges for central banks and financial regulators."
75 Campiglio *et al.*
76 CISL and UNEP FI, "Stability and Sustainability in Banking Reform: Are Environmental Risks Missing in Basel III?"

efficiently allocate the financial resources to green projects and assets, to analyze their exposure to environmental risks, and to develop new green products that could be offered based on a common reference[(a)]. Moreover, it can also serve as a monitoring tool for FIs to assess the level of 'greenness' of their portfolio and their alignment with environmental policies over time. By fostering environmental disclosure, a taxonomy also helps to limit problems such as greenwashing and green marketing.

Given the expected benefits and with the expansion of the green bonds' market, several countries have started to develop their own taxonomies. Each framework is elaborated to help financial markets and institutions to better align with environmental and climate policies. China established the Green Industry Guiding Catalogue which has a focus on pollution prevention and control, and developed the Green Bond Endorsed Project Catalogue to boost investments toward projects with environmental benefits through the Green Bonds market[(b)].

The European Union Taxonomy covers *"a list of economic activities which can make a substantial contribution to climate change mitigation, and criteria to do no significant harm to other environmental objectives. It also presents a framework for evaluating substantial contribution to climate change adaptation."* The EU believes that a taxonomy can enable capital markets to identify project opportunities that contribute to environmental policy objectives and consequently allocate finances towards a low carbon economy[(c)].

The Standards Council of Canada is working currently as well on a made-in-Canada definition of green. The taxonomy under development seeks to include in the classification several Canadian natural-resource sectors as being green or specially in transition, so they are not excluded from green and sustainable finance global markets[(d)].

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(a) EBF, "Towards a Green Finance Framework."
(b) Climate Bonds Initiative, "Comparing China's Green Bond Endorsed Project Catalogue and the Green Industry Guiding Catalogue with the EU Sustainable Finance Taxonomy."
(c) EU Technical Expert Group on Sustainable Finance, "Taxonomy technical report."
(d) Canadian Standards Association, "Sustainable Finance-Defining Green Taxonomy for Canada."

Green or Sustainable labels or standards are also quite useful instruments to improve transparency. For instance, the existence of Green Bond standards helps investors better assess the nature of this asset class. They were initially developed through voluntary Principles by market initiatives (*e.g.* Climate Bonds Initiative) or the market industry (International Capital Market Association). Financial regulators have also developed standards (*e.g.* Chinese Green Bond Guidelines in 2015 or the upcoming EU Green Bond Standards). In the same vein, labels for investment funds (*e.g.* SRI and GreenFin labels in France, LuxFlag labels in Luxemburg) help institutional investors as well as retail investors to make better informed decisions.

3.3. Integrate climate change into fiduciary responsibility

This is a question to be addressed in priority by **financial market regulators** as fiduciary responsibility has become a key element of the behavior of asset managers and asset holders (*i.e.* pension funds or sovereign funds).

As explained in the UNEP-PRI report[77] of 2015, "fiduciary duties exist to ensure that those who manage other people's money act in the interest of beneficiaries, rather than serving their own interest". The most important duties are loyalty ("fiduciaries should act in good faith in the interest of their beneficiaries") and prudence. The report noted that "many investors continue to point their fiduciary duties and to the need to deliver financial returns to their beneficiaries as reasons why they cannot do more on responsible investment".

The legal context varies across countries. In common law jurisdictions, fiduciary duties play an important role as they are the main limits of investment managers' discretion – under courts' auspices - apart from contractual or regulatory obligations. In civil law jurisdictions, fiduciary duties are "set out in statutory provisions regulating the conduct of investment decision-makers and in the governmental and other guidelines that assist in the interpretation of these provisions".

With the development of 'responsible investment', the question as to whether the integration of ESG criteria into the investment process was legitimate vis-à-vis fiduciary duty has been going on. The response brought by the 2015 report was quite clear: "failing to consider long-term investment value drivers, which include environmental, social and governance issues, in investment practice is a failure of fiduciary duty".

Five years later, this report's assessment is still broadly valid. The common approach of fiduciary duty (*i.e.* for asset managers and asset owners to act in the 'best interest' of their clients) remains too often to simply maximize the financial

77 Rory Sullivan *et al.*, "Fiduciary Duty in the 21st Century."

returns of clients assuming this is their main 'interest'. This stems largely from the perception that ESG factors, and notably climate change, are non-financial and therefore outside of the scope of fiduciary duties. In addition, as market participants have a short-term bias, this maximization of returns is mostly considered as a short-term objective.

Over the recent years, considering the pervasive narrow interpretation of fiduciary duties among investors, several publics authorities have decided to take initiatives to push financial institutions to take ESG issues, including climate change, into consideration in their investment decisions (see **Box 7**).

BOX 7 - EXAMPLES OF REGULATORY MEASURES RELATED TO FIDUCIARY DUTY

1/ In the UK

The Pension Regulator clarified in 2016 and 2017 guidance that ESG material issues should be taken into consideration by pension fund trustees[(a)] [(b)] The legislation was then changed and as of October 2019, UK pension funds have a legal responsibility[(c)] to integrate ESG issues into their investment approach. They have to disclose how they take account of ESG issues and their approach to stewardship, and how they integrate member preferences on sustainability impacts.

Another step was taken with the UK Stewardship Code 2020[(d)] published late 2019 by the Financial Reporting Council. The new code sets a clear benchmark for asset managers and asset owners regarding the creation of long-term values for clients and beneficiaries. In particular, the code sets expectations as how material ESG factors – including climate change - are integrated in their investment decisions. Organizations willing to become signatories of the Code are required to disclose information regarding the way they have implemented the Code.

2/ In Canada

In 2017, the Canadian Association of Pension Supervisory Authorities (CAPSA) published a new advisory guideline[(e)] mentioning environmental, social, and governance (ESG) issues among the risks to be evaluated by pension plan administrators.

A new step was achieved with the publication in June 2019 of the Final Report of the Expert Panel on Sustainable Finance[(f)]. One of the 15 recommendations aimed at clarifying that fiduciary duty cannot be seen any longer as an obstacle to consider ESG issues such as climate-related risks or potential stranded assets. It recommended that the Minister of Finance issue a statement to clarify that "climate factors are within the remit of fiduciary duty".

3/ In the EU - Action Plan on Sustainable Finance (March 2018)

One action aimed at clarifying institutional investors' and asset managers' duties regarding sustainability considerations and requiring them to be integrated in their decision-making process. Given that current EU rules on fiduciary duties were not clear enough, the Action Plan considered that institutional investors and asset managers did not sufficiently integrate sustainability factors and risks in the investment process. In addition, the information provided to their clients regarding the way they did it was not sufficient. Therefore, final investors do not receive appropriate information and, as a result, they do not sufficiently take into account the impact of sustainability risks when assessing the performance of their investments over time.

In the following months, the EU Commission has tabled various legislative proposals:

- a regulation to set disclosure obligations on how institutional investors and asset managers integrate ESG factors in their investment decisions and risk management process (Regulation adopted end 2019);
- proposals to clarify how asset managers, insurance companies, and investment or insurance advisors should integrate sustainability risks in their management process.

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(a) The Pensions Regulator, "Investment guidance for defined benefit pension schemes."
(b) The Pensions Regulator, "A guide to Investment governance."
(c) Secretary of State for Work and Pensions UK, The Pension Protection Fund (Pensionable Service) and Occupational Pension Schemes (Investment and Disclosure) (Amendment and Modification) Regulations
(d) Financial Reporting Council, "The UK Stewardship Code 2020."
(e) CAPSA/ACOR, "Guideline No. 4: Pension Plan Governance Guideline."
(f) Macklem T. "Final Report of the Expert Panel on Sustainable Finance – Mobilizing Finance for Sustainable Growth"

These examples demonstrate that integrating ESG factors into fiduciary responsibility has several dimensions:

- Integrating these ESG factors into asset managers and asset owners' management processes and investment decisions;
- Providing clear information to the clients on how this integration is carried out;
- Identifying the objectives of clients who may have other objectives (or 'interests') than short term profit maximization. Managers should then ask their clients what their objective interests are and in case of competing interests, what their ranking is. This leads to another difficulty for asset managers facing different client preferences when they need to take decisions that affect all retail investors (a typical case is provided by pension funds).

If there is a growing consensus – at least in Europe – to consider that investors and asset managers should include sustainability in their objectives, there are still issues regarding how to do it and to what extent. For instance, how could they manage the tension between sustainability and profit maximization objective?

Finally, there is the question of how can sustainability be best included in fiduciary duty? Should we assume this will naturally be done by market participants (*e.g.* through financial industry's initiatives) or should the financial regulation impose the integration of sustainability objectives into fiduciary responsibility? The example of the UK and Canada show that even in common law jurisdictions, there is a role to play for public authorities and for financial regulation. It is even more the case in the European Union where fiduciary duties are already defined by various legislations.

The question is then how financial regulation should address fiduciary duty. Should all ESG factors be treated in the same way or should climate change be specifically addressed? To what extent non-financial factors should become intrusive in the decision process vis-à-vis financial criteria?

Aligning the fiduciary duties of financial institutions with sustainability considerations is clearly a key challenge. This is a complex and far-reaching debate which goes beyond the sole financial sector and is relevant for retail investors as well (they need to express their investment objectives and ESG preferences, and they need to be well informed to take decisions in this domain). This is clearly an area where further research would be useful.

3.4. Protect micro prudential stability

This issue is relevant for **all financial regulators** which supervise individual financial institutions (banks, insurance or asset managers).

There are two avenues to reinforce micro-prudential stability *i.e.* the soundness of each individual financial actor. The first is to promote **the integration of climate-related factors in the risk management process** of individual financial institution[78]. The second one is to **set prudential regulations** to impose climate-adjusted requirements to ensure the soundness of individual financial actors subject to supervision. For regulated entities (banks, insurance, asset managers, etc.) which form the majority of financial actors, both avenues are available. And in most countries, both are used in order to improve overall banks' resilience. For instance, banks – in most OECD jurisdictions – are required to implement appropriate risk management systems under the control of bank supervisors and are at the same time subject to micro prudential requirements (capital level, liquidity, large exposures, etc.). However, in a few cases, the approach through the risk management process has been privileged (*e.g.* the case of Peru which has set rules to require banks to carry out due diligence "to more deeply analyze the underlying social, environmental and economic risks related to the loan" (UNEP FI-CISL 2015).

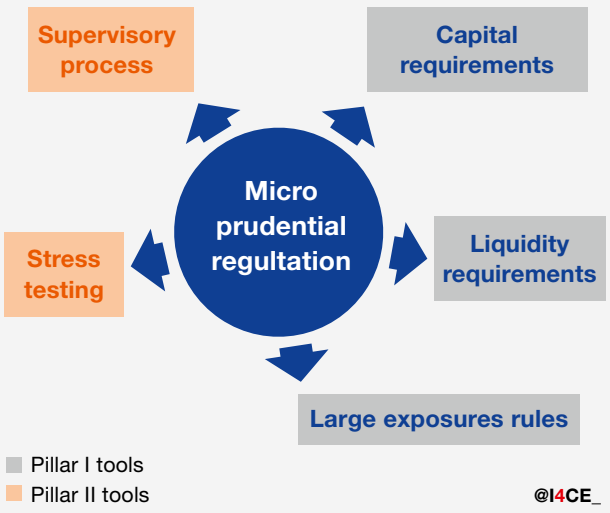
The report will focus below on the example of banks and assumes that prudential requirements play a leading role on the design of banks' risk management systems. Further research would be needed to confirm this assumption**. It should be necessary as well to expand the analysis to other supervised entities such as insurance companies for which relevant instruments are available** (for an overview of supervisory practices for insurance, see the IAIS-SIF 2018 Issues Note already mentioned).

78 UNEP Finance Initiative, UNEP Inquiry, and University of Cambridge - Institute for sustainability leadership, "Banking & Sustainability -Time for Convergence: A Policy Briefing on the links between Financial Stability and Environmental Sustainability."

The following analysis looks at available micro prudential tools to protect banks from climate-related risks. It also identifies those which might be adverse to the financing of transition. These tools can be regrouped in Pillar I and Pillar II tools[79] (see **Figure 4**).

FIGURE 4

MICRO PRUDENTIAL TOOLS TO PROTECT BANKS FROM CLIMATE-RELATED RISKS



Source: I4CE

3.4.1. Micro prudential regulation - Pillar 1 tools

The most recent Basel Committee Accord (known as Basel III) has integrated in the bank regulatory framework the lessons drawn from the Global Financial Crisis. Most notably, capital requirements have been strengthened and liquidity rules have been put in place. But despite this comprehensive overhaul of the international regulatory framework - which has mobilized bank regulators around the world for years- climate-related risks remain absent of the framework. The CISL notes: "The current Basel Capital Accord does not take explicit account of, and therefore only marginally addresses, these [environmental risks] issues"[80]. More specifically, the report notes: "Pillar 1 […] does require banks to assess the impact of specific environmental risks on the bank's credit and operational risk exposures, but these are mainly transaction-specific risks […]. These transaction specific risks are narrowly defined and do not constitute broader macro prudential or portfolio wide risks for the banks[81]."

It goes on: "by failing to address systemic environmental risks, Basel III is arguably overlooking an important source of risk to the financial system and broader economy, despite its overriding objective of guaranteeing banking stability". Since this report (2014), a large part of the international regulatory community has become aware of this situation and envisaged to act. However, given the divergence of views within members on the priority to give to climate change, the Basel Committee itself was not considered to be a possible avenue to address this 'regulatory failure'. To some extent, the setting of a new 'informal club' of central banks and supervisors willing to address financial stability challenges resulting from climate change (the NGFS) was an alternative solution to this situation. However, the NGFS is not a standard setting body and will have limited room for maneuver without the Basel Committee involvement (see Section 4.3.1).

The main Pilar 1 tools are capital requirements, the leverage ratio, liquidity requirements and by extension credit limits.

Capital requirements set rules for banks to calculate the minimum level of capital they must hold against their assets. These rules cover both the definition of 'capital' and the calculation of the minimum capital required. The latter is based on the amount of 'risks' to which each bank is exposed. It is calculated with either the Basel III standard model (based on 'risk factors' applied to different type of assets) or the bank's internal model using its own historic default and loss data. Basel III has set a minimum capital and a capital conservation buffer calculated on the risk weighted assets (there is also a countercyclical capital buffer which can be applied by national authorities when macro prudential circumstances warrant – see Section 3.5).

The first question is whether these rules are adverse to green activities. Many authors consider it is the case given the more rigorous treatment of long-term loans (7 years or more) in terms of capital requirements compared to shorter term loans (long term loans are considered riskier, all things being equal). For those authors[82], this regulatory provision impacts the financing of low-carbon transition which requires many green infrastructure projects that are also long-term projects by nature. However, other authors challenge this view and consider that in most countries the majority of the green financing will go through short-term lending; in addition, they argue that capital requirements have a marginal effect on lending decision regarding infrastructure projects which are primarily influenced by political and economic risks[83]. Further research would be needed in this domain.

79 The notion of "Pillar" was introduced into the Basel Committee Accord of 1999 (Basel II): Pillar 1 set the minimum capital requirements for banks, Pillars 2 set the principles for conducting the Supervisory Review Process and Pillar 3 set the rules for market discipline and enhanced disclosure. Basel III further strengthened minimum capital requirements and complemented Pillar 1 with liquidity requirements and an extra capital charge for Systemically important financial institutions (SIFIs). It also strengthened the principles for sound stress tests as well as the supervisory role to assess them.

80 CISL and UNEP FI, "Stability and Sustainability in Banking Reform: Are Environmental Risks Missing in Basel III?"

81 "These (risks) are mainly transaction-specific risks that affected the borrower's ability to repay a loan or address the 'deep pockets' doctrine of lender liability for damages and cost of property clean-up. For example, paragraph 510 of Basel II and III (Pillar 1) requires banks to 'appropriately monitor the risk of environmental liability arising in respect of the collateral, such as the presence of toxic material on a property'

82 See D'Orazio and Popoyan, "Fostering green investments and tackling climate-related financial risks.", for a review of some of these authors.

83 CISL and UNEP FI, "Stability and Sustainability in Banking Reform: Are Environmental Risks Missing in Basel III?"

The second question is to see how these regulatory tools could be made 'greener'. In this regard, it has been proposed by some authors to use capital requirement to deal with climate-related risks[84]. More specifically, a climate adjustment factor could be used to modify the 'risk weight factor' of assets depending on their impact on the transition to a low-carbon economy (*e.g.* to decrease the risk weight factor applied to 'green assets' in the case of a Green Supporting Factor and/or increase that of applied to 'brown assets' in the case of a Brown Penalizing Factor).

This proposal has been largely debated regarding its technical feasibility, its effectiveness on credit allocation and its possible unintended consequences on banks' soundness. In order to clarify this debate, it is key when looking at integrating climate-related risks into capital requirements to distinguish between two different approaches: **the risk approach** – which seeks to increase banks' resilience to climate-related risks and thereby ensure financial stability – and **the economic policy approach** – which aims to use capital requirements as a policy tool to channel financial flows toward a low-carbon economy (M. Berenguer *et al.*2020).

Different regulatory solutions have been proposed (see **Box 8**). But specific challenges would need to be addressed before implementing any of these measures which depend on the objectives to pursue:

- If the objective is to adjust capital requirements to the real risk level of assets, one needs to accurately measure the level of climate-related risks of each category of assets. This is a major challenge given the radical uncertainty associated to climate change – which prevents from using probabilistic data - and the short-term horizon of standard credit models compared to the medium-long term horizon of climate-related risks.
- If the objective is an economic policy one (*i.e.* channeling more credits toward low-carbon transition away from 'brown' activities), the difficulties to measure the accurate level of risk of assets is no longer a key problem. The question is rather to find a metric allowing to differentiate among activities based on their contribution to a low-carbon economy. But still they are challenges to meet. The first one relates to the effectiveness of adjusting banks' capital requirements to decrease or increase specific categories of credit; so far, the empirical evidence to support this effectiveness is rather weak (this raises the issue of a proper calibration of the measure). The second challenge is that such an economic policy tool should not endanger financial stability. The key issue would then to ensure the 'capital neutrality' of such a policy to ensure that banks' soundness will remain not affected over time (*i.e.* maintaining banks' capital base at the level required today according to current prudential rules). In addition, a common taxonomy would be a pre-condition under this approach (a 'green' or a 'green and brown' taxonomy depending on the instrument chosen).

Finally, it is important to stress that pursuing the risks and the economic policy objectives in parallel can create tensions in designing the capital requirement adjustment. At some point, it is necessary to give preference to one objective, probably to the detriment of the other.

BOX 8 - HOW TO INTEGRATE CLIMATE RISKS INTO BANKS' CAPITAL REQUIREMENTS? [(a)]

In December 2017, commissioner Valdis Dombrovskis announced that the European Union's Commission would take a closer look into implementing a supporting factor to reduce capital requirements for certain climate-friendly activities and with it boost green investments and loans [(b)] This is the idea behind the so called Green Supporting Factor (GSF), a provision that would lower the 'prudential risk weight' of green assets and consequently would make them more profitable to banks than non-eco friendly assets. Conversely to the GSF, the Brown Penalizing Factor aims at discouraging brown activities that contribute to climate change. The BPF would increase the 'risk weight' of brown assets and increase the prudential capital required to banks, making these loans less attractive for them.

The idea of using either a GSF or a BPF is controversial and the option of combining both to overcome the weakness of each instrument was developed. This combination would create a bonus and penalty factor at the same time, with the aim of shifting credit allocation from brown to green activities. The objective of the combination is to better reflect the risk of all underlying exposures, both to green and brown activities.

In the same vein, French bank Natixis has developed an 'in-house' methodology called the Green Weighting Factor (GWF): it allocates internal capital according to the climate and environmental impacts of each financial transaction. Natixis assesses all its assets according to the GWF methodology and according to the resulting score a different internal capital allocation is applied. Another methodology, the Environment-risk Weighted Asset (ERWA), applies a pollution coefficient to the current RWA. It functions as a policy tool to orient the allocation of capital from more pollutant to less pollutant activities.

(a) Berenguer, Cardona, and Evain, "The integration of climate-related risks into banks' capital requirement ." March 2020 Institute for Climate Economics – I4CE
(b) Dombrovskis, "Greening finance for sustainable business: Speech by Vice-President for the Euro and Social Dialogue, Financial Stability and Financial Services Valdis Dombrovskis."

84 Schoenmaker, van Tilburg, and Wijffels, "What Role for Financial Supervisors in Addressing Systemic Environmental Risks?"

Nevertheless, all mechanisms mentioned above possess advantages and disadvantages that should be carefully analyzed before any decision making. For example, the GSF might in theory help fill the green investment gap (provided it has the expected impact) but if calibrated inadequately it can also reduce banks' capital and generate future financial instability. Conversely, the BPF would reinforce banks' resilience against climate-related risks; but it could be difficult not to penalize corporates engaged in transforming their business from brown to green activities. In addition, as a punishing tool, it might have less political acceptance.

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Another type of capital requirement is available: **the leverage ratio**. Introduced in the international framework by Basel III, this tool aims at limiting the overall bank's leverage. It sets a ratio between bank's capital and its total exposures (both on and off-balance-sheet exposures without risk weighting). P. d'Orazio *et al.* propose to complement it with a Sectoral leverage ratio imposing a more stringent leverage ratio on carbon-intensive assets. They consider this SLR would set similar incentives for banks than the maximum credit ceiling[85]. Assessing the effectiveness of such an instrument compared to banks' capital requirements and credit ceilings, and its implementation challenges would require further research.

Liquidity requirements are another regulatory requirement that could be used. Under Basel III, banks are subject to a Liquidity Coverage Ratio (requiring banks to hold a certain level of short-term assets) and a Net Stable Funding Ratio (requiring long-term assets to be funded with more than one-year duration instruments). As for capital requirements, these liquidity requirements are deemed by some analysts to play against the funding of green activities arguing that "Basel III liquidity rules are likely to make long-term financing more expensive, which will particularly affect 'patient' green investments…"[86]

It could be envisioned to differentiate these liquidity requirements to take into consideration climate change in order to give a preferential treatment to green assets compared to brown assets. Again, such a proposal should be considered differently according to the objective followed:

- From a risk perspective, there is no evidence that the liquidity risk of green assets or their need of stable funding is less important than that of the other bank' assets; therefore, a preferential treatment for green assets is not supported by empirical evidence. However, turning to "brown assets", it is more convincing to consider that some of these could face a very high liquidity risk (*e.g.* "stranded assets"). This is an area where more research should be carried out in order to prevent banks from liquidity strains, particularly should the transition be disorderly.
- From a policy-perspective, one may argue that a differentiated treatment for green and brown assets could facilitate the financing of green activities (which would benefit from less stringent liquidity requirements) and slow down the financing of brown activities. In particular, it has been proposed the "introduction of a lower required stable funding factor" under certain conditions to support 'green' assets[87]. Putting aside the question of the taxonomy needed to identify green and brown assets, there is a lack of evidence to support the effectiveness of such a policy (*i.e.* to which extent a sole differentiated treatment in terms of liquidity requirements would be efficient to channel credit away from brown to green activities). Again, this seems to be a topic for further research before taking a firm stance. And, finally, as for capital requirements, it would be key to find appropriate mechanisms to ensure the neutrality of such a tool on the overall liquidity of banks.

Prudential credit rules constitute a last group of tools that could be considered here, although they do not belong to Pilar 1 tools. These rules are large exposure rules and concentration limits set for each bank (minimum credit floor and maximum credit ceilings – which are not considered as primarily prudential instruments - are analyzed later in the report as "credit limits").

- Large exposure rules set limits (usually a given percentage of the own funds) that individual loans cannot exceed
- Concentration limits set limits (usually another given percentage of own funds) that that the total amount of large loans cannot exceed.

Prudential credit limits are primarily prudential rules. Their objective is to force banks to diversify their loan portfolio to be able to better withstand the failure of a large individual corporate or of a group of large corporates. Some authors consider them as one of the "most appropriate supervisory instruments to deal with material risks related to climate change". They propose to apply concentration limits to the "overall investment in carbon-intensive assets that are highly vulnerable to an abrupt transition to the low-carbon economy"[88]. P. d'Orazio considers the implementation of such tool would require a clear definition of "carbon-intensive assets", appropriate disclosure by corporates and a delicate calibration of the limits[89].

85 D'Orazio and Popoyan, "Fostering green investments and tackling climate-related financial risks."
86 D'Orazio and Popoyan.
87 D'Orazio and Popoyan.
88 Schoenmaker, van Tilburg, and Wijffels, "What Role for Financial Supervisors in Addressing Systemic Environmental Risks?"
89 D'Orazio and Popoyan, "Fostering green investments and tackling climate-related financial risks."

It is rather difficult to see how these prudential credit rules could be differentiated for green and brown assets without conflicting with their primary prudential objective. However, some authors propose to use them as a policy-oriented instrument only focused on brown assets. Further research is therefore needed in this domain.

3.4.2. Micro prudential regulation - Pilar 2 tools

As already mentioned, the report will focus below on the case of bank regulation. A parallel discussion of instruments relevant to insurance would be required.

Pillar 2 sets the principle for the Supervisory review that allows supervisors to review the general bank's governance and to follow an Internal Capital Adequacy Assessment Process (ICAAP). This review is carried out at a broad portfolio level and allows supervisors to consider an overall approach to assess the adequacy of capital vis-à-vis the level of risks. Based on the ICAAP, supervisors can adjust the calculation of minimum capital and liquidity requirements resulting from the Pillar 1[90].

The "fundamental principle of sound capital assessment" put forward in Pillar 2 of Basel III requires banks to address all "material risks" identified. As for Pillar 1 tools, the Basel Committee has not aimed at addressing environmental risks; again this 'regulatory failure' is hampering the international regulatory framework to correctly address this new category of risks and is slowing down supervisors' actions in this domain. It needs to be addressed at the international level.

However, one could argue that nothing really prevents supervisors at the national level from considering that climate-related risks are 'material'. Thus, although climate-related risks or environmental risks are not explicitly mentioned in Basel III, supervisors could deem these risks are 'material' and ask banks to take them into account. One of the first supervisors to use this possibility was Brazil in 2014 (CISL report); since then, other supervisors -mostly in Europe- have followed the same path to encourage banks to better assess their individual exposures to climate-related risks. However, it could be difficult for supervisors to request banks to hold additional capital without a more solid regulatory basis (supervisors' decisions might even risk to be challenged in courts by banks).

Stress testing is one tool that supervisors can use in this review process. In order to verify the adequacy of banks' capital, supervisors ask them to run through their internal models, macroeconomic scenarios assuming very deteriorated conditions for instance in growth, financial market prices, real estate prices, exchange rates, etc. ('stressed scenarios'). Applying these macroeconomic shocks to banks' portfolio allows to measure the deterioration of credit and financial assets quality resulting from these stressed macro-economic conditions, and the impact on banks' profit & loss statement and balance sheet. Supervisors[91] have started to prepare 'climate stress tests' with some of them having already carried out preliminary exercises (DNB and PRA). There is a distinction to be made between two different types of exercises:

- **Climate stress tests**: these would be based on macro-economic models capable of integrating climate change in order to determine its impact on macroeconomic variables. Such exercise will require a difficult modelling given the complexity of links between climate change, climate impacts, socio-economic conditions and level of CO^2 emissions[92]. And the calibration will be particularly difficult given the lack of historic statistical data about the effects of climate change.
- **Sensitivity analysis**: these are less comprehensive and ambitious exercises. They test the sensibility of banks' profit & loss account and balance sheet vis-à-vis a few selected parameters. The level of these parameters is not resulting from a macroeconomic model. The 'stress tests' that were carried out by the PRA look more like sensitivity analyses. This more pragmatic and less ambitious approach could be privileged by supervisors in the short term.

Climate stress tests and sensitivity analyses face difficult challenges:

- Both tools should cover transition and physical risks. But so far, more emphasis has been put on transition risks in most cases (in the banking sector contrary to the insurance sector).
- A key challenge is related to the definition of scenarios to be stressed: they need to be plausible but severe enough, meaningful for all financial institutions within a jurisdiction (for comparability sake) or at the international level (for level playing field), and they need to stress the relevant risk drivers (the channels through which climate risks will impact the counterparts of the financial institutions).
- Another difficulty is the discrepancy between the short-term horizon of usual stress test exercises and the medium-long term horizon of climate risks.

Once these exercises provide reliable assessment of climate change impacts, the question is whether they could be used by supervisors in the Pilar 2 supervisory process to require additional capital for banks with a high profile of climate-related risks.

90 CISL and UNEP FI, "Stability and Sustainability in Banking Reform: Are Environmental Risks Missing in Basel III?"

91 It is worth mentioning here that climate-related stress-testing has been initiated mostly by insurers that are historically more sensitive to natural catastrophes and have therefore developed stress-tests of weather-related natural disaster events – see the IAIS-SIF Issues Paper for a detailed presentation of insurance climate stress testing

92 Colin, Vailles, and Hubert, "Understanding transition scenarios - Eight steps for reading and interpreting these scenarios." I4CE

3.5. Safeguard macro prudential stability

This issue is relevant to **all financial regulators**. The report will focus below on the example of banks.

Macro prudential policy became a concern for regulators across countries after the 2007 financial crisis which made clear that micro supervision was not sufficient to ensure the stability of the whole financial sector (see Section 2.1). Its objective is twofold: strengthen the banking sector's resilience and dampen the financial cycle booms and busts. A variety of macro prudential instruments have been used in the last decade and the Basel III framework has set specific provisions to provide a "macro prudential overlay" (see **Box 9**).

As regulators have recognized the potential systemic risk stemming from climate change, it is fair to look at whether macro prudential instruments could be used in this context in addition to the prudential tools aiming at protecting banks' soundness at the individual entity level. Dikau considers that a green macro prudential policy, in addition to the standard financial stability and procyclical objectives, could have an allocative impact and incentivize a transition to a low-carbon economy[93].

3.5.1. Climate macro stress tests

An effective surveillance framework of systemic risks is critical for public authorities in charge of macro prudential policy. Among a large array of risk indicators, macro stress testing plays a critical role. For years, national supervisors and the IMF have run stress-tests at the level of the whole financial sector (or banking sector) of a given country in order to measure the systemic impact of deteriorated macroeconomic conditions. Building on stress tests developed for individual institutions, these macro stress tests aim at taking into account the impact on individual institutions as well as market dynamics and the 'domino effect' (contagion effect) which can exacerbate the financial impacts (see for instance the domino effect triggered by Lehman's Brothers default). They also take into account the interactions between financial system distress and the real economy.

In order to better monitor the climate-related systemic risk, it is necessary to integrate the impact of climate change into these macro stress tests. A few exercises have already been carried out. Thus, researchers from the Dutch national central bank (DNB) have tested the impact of a selected transition scenarios on the Dutch financial sector and concluded the impact was material[94]. In another research, Battiston has shown that the indirect climate exposures of financial players (through exposures on other financial players) could be materially significant for financial stability. For instance, the indirect exposure of pension funds to highly carbon emitting sectors (through equity shares of investment funds or holding of bonds and loans to banks) is similar to their direct exposures (through direct holding of bonds and equities)[95].

3.5.2. Counter Cyclical Capital Buffer

Numerous instruments have been used for macro prudential purposes (see **Box 9**). When considering the way to use these instruments against climate change, the most relevant ones might be those that directly target credit growth (*e.g.* capital buffers applied to risk weighted assets) or credit sectoral allocation (*e.g.* large exposure rules applied to potential stranded assets). Instruments targeting specific categories of credits (*e.g.* caps on loan to value ratio or debt-to-service ratio) could also be envisaged but their impact would be limited by definition to a specific sector (real estate in these examples). In the same vein, the leverage ratio could be considered as a macro prudential instrument; however, the effectiveness of limiting the leverage of banks on credit growth should be compared to that of setting capital buffers.

Against this backdrop, the countercyclical capital buffer set by Basel III appears as an interesting instrument to be considered. As one of the key objectives of Basel III was to prevent a new systemic crisis, it introduced new prudential tools to provide authorities in charge of monitoring financial stability at the national level with appropriate tools. Among these new tools, the Countercyclical Capital Buffer allows regulatory authorities to set additional capital buffers for banks whenever they deem necessary to "reinforce financial institutions defenses against the build-up of systemic vulnerabilities and serve as a cushion during the contractionary phase of a credit cycle"[96]. Indeed, the experience shows that banks tend to take more risks at the peak of the economic cycle and accelerate credit distribution instead of preparing the upcoming recession phase that will inevitably deteriorate the overall credit quality of their clients. This countercyclical capital buffer has a twofold objective: it reinforces banks' resilience before the upcoming economic downturn and at the same time it mitigates the peak level of the economic cycle through the slowdown of credit distribution (which is normally expected when capital charges are increased). This tool has only been used recently and in a limited number of jurisdictions, at least in developed economies; therefore, there is a lack of evidence regarding its effectiveness to limit credit growth. In addition, as it applies to all banks' assets, its allocative power is questionable.

93 S. Dikau, N. Robbins and M. Täger "Building a sustainable financial system: the state of practice and future priorities" in Banco de Espana Financial Stability Report, Issue 37
94 R. Vermeulen *et al.* "An energy transition risk stress test for the financial system of the Netherlands"
95 Battiston *et al.*, "A climate stress-test of the financial system."
96 D'Orazio and Popoyan, "Fostering green investments and tackling climate-related financial risks."

Some authors propose to use it "to favor financial stability in the transition process from the high-carbon to the low-carbon economy as it is meant to help banks to lean against the build-up phase of the carbon intensive credit cycle" [97]. This proposal is based on an analogy between financial bubbles and a so-called 'carbon bubble' although some features differentiate these phenomena. In particular, standard financial bubbles go through boom and bust phases whereas the 'carbon-bubble' results from a programed-decline of fossil fuels with potential stranded assets.

Given the specificities of the carbon-bubble, the appropriate features and the potential effectiveness of a Countercyclical Capital Buffer would need to be further investigated. In addition, the calibration of such a capital buffer would require a lot of attention.

BOX 9 - MACRO PRUDENTIAL POLICY AND INSTRUMENTS

Macro prudential policy

"Macro prudential policies aim to address two dimensions of system-wide risk: first, the evolution of system-wide risk *over time* – the 'time dimension' and second, the distribution of risk in the financial system *at a given point in time* – the 'cross-sectional dimension' [(a)] The main objective in the time dimension is to mitigate financial system *procyclicality* whereas it is to reduce systemic risk concentrations in the cross-sectional dimension.

Macro prudential instruments

They have long been used by emerging market central banks, for instance after the Asian crisis to prevent the build-up of financial vulnerabilities or in Latin America to smooth the macroeconomic impact of large swings in external financing. However, the financial crisis of 2007-2008 highlighted the necessity to complement micro-supervision with macro-supervision and macro prudential policy came to the forefront of regulators concerns.

There is no clear definition of macro prudential instruments. Public authorities, notably central banks, have used a variety of tools to strengthen the resilience of the financial system and mitigate financial booms. Some prudential tools can be used for both micro and macro prudential purposes (*e.g.* the leverage ratio). Some other instruments can be used for monetary as well as macro prudential objectives (*e.g.* reserve requirements). And non-prudential tools can be used as well (*e.g.* capital flow management measures). [(b)]

The list of possible macro prudential tools is rather long. The most commonly used in the banking sector are countercyclical capital buffers, sectoral capital requirements, countercyclical capital requirements, LTV ratios, Debt-to-income or Debt-to-Service ratio, limits on currency mismatches. Some of these instruments target specific sectors (*e.g.* LTV and DTS for real estate market risks). Conversely, few of them target corporate credit. These instruments can be price (*e.g.* countercyclical capital requirements) or quantity-based (caps on aggregate exposures or loan-to-value ratio or currency exposures).

Basel III

Regarding the time dimension (mainly concerned with procyclicality), Basel III has put in place a new specific macro prudential regulatory instrument with the countercyclical capital buffer. The buffer is designed to accumulate capital during boom times (and build-up of systemic risk) and to be used when these risks materialize. During the build-up period, it aims at slowing down the development of imbalances (*e.g.* excessive credit growth). During the contraction phase, banks are allowed by supervisors to use this buffer of capital to face additional losses resulting from the crisis.

Other provisions of Basel III can help to mitigate procyclicality although they were primarily designed as micro-prudential tools. First, the capital conservation buffer allows banks to absorb losses without reaching the minimum capital level. Second, the minimum leverage ratio and the new liquidity standards could help limit the build-up of financial imbalances during the expansion phase of the cycle. In addition, a large exposures regime helps mitigates systemic risks resulting from concentrated exposures and interlinkages across financial institutions.

The 'cross-sectional dimension' was mainly addressed in the Basel III framework through specific provisions regarding systemic institutions.

(a) "Macro prudential policy tools and frameworks" Update to G20 Finance Ministers and Central Bank Governors

(b) "Macro prudential frameworks: objectives, decisions and policy interactions" Agustín Villar in "Macro prudential frameworks, implementation and relationship with other policies" BIS Papers No. 94

97 D'Orazio and Popoyan, "Fostering green investments and tackling climate-related financial risks."

3.6. Promote investment allocation according to policy objectives

The existing instruments are mainly available for **banks' regulators** as banks were the primary source of financing in the countries which experienced this type of instruments.

Several emerging market economies have been using financial regulations primarily for policy objectives. These instruments can help to reduce policy uncertainties while accelerating the development of sustainable finance. The following instruments help regulators to direct lending to specific sectors of the economy which foster the transition to a low carbon economy.

State-directed priority sector lending programs (PSLs) allow integration of environmental and climate factors into the long-standing requirements on banks to allocate loans to pre-determined sectors. **PSLs** have been widely used to increase access to capital for specific sectors of the economy such as SMEs and agriculture through lending quotas or interest rate caps for example. More recently countries started to use PSLs as a policy tool to close the financial gap to green assets that are currently under financed by the financial system. In 2015, for example, India included in its priority sector list, to which 40% of bank lending needs to be directed, the renewable energy sector. Overtime it was observed that PSL can be successful but, at the same time, cannot necessarily provide substantial changes in the financial flows to more vulnerable sectors.[98]

Incentive schemes are instruments that can help the market to shift investments from brown to green activities by making green activities more attractive for investors. Some of these tools were previously mentioned in this report as the adjustment of capital and liquidity requirements can follow a policy objective to redirect credits away from carbon-intensive activities. Another example is provided by Bank of Bangladesh which applies a set of incentives and disincentives to loans according to their environmental performance (pre and post disbursement). Environmental-friendly loans, or activities that become 'greener' over time, can benefit for instance lower interest rates, flexibility in loan conditions, permits for business expansion, and favorable loan to value ratio for borrowers.[99]

Credit limits are another possible tool for pursuing policy objectives. They differ from the prudential credit rules described in Section 3.4-Pilar 1 which aim at limiting the **credit risk exposure** of banks whereas credit limits aims at curbing **sectoral credit distribution** (either toward specific sectors or from specific sectors).The very nature of these credit limits is disputed: P. d'Orazio *et al.*[100] consider they initially used to be applied as policy instruments; but after the Global financial Crisis they were rather defined as macro prudential instruments to be adjusted through the credit and leverage cycle. However, the Emerging Market Economies – EMEs are primarily using them as economic policy instruments.

There are two categories of credit limits:

- minimum credit floor: banks are obliged to distribute a minimum amount or percentage of credit to one or several specific economic sectors;
- and maximum credit ceiling: banks cannot distribute loan to one or several specific sectors beyond a certain amount or percentage of their credit.

They both aim at curbing the distribution of credit away from specific sectors to the benefice of other sectors according to economic policy choices.

Volz states that "a straightforward way of addressing environmental systemic risk would be to introduce ceilings on credit extension to certain carbon-intensive or polluting activities. Credit ceilings have fallen out of fashion since they are regarded as non-market instruments, but in the past, they were commonly used by central banks to limit credit expansion without increasing interest rate"[101].

The setting of Green Finance Guidelines is another category of tools mentioned by Volz "aimed at guiding banks toward greener lending"[102]. Again, these instruments differ from Pillar 1 instruments presented already as they do not aim at limiting banks' risk exposure but rather aim at influencing sectoral credit allocation. They should rely on an existing taxonomy such as in the Chinese case (see **Box 6**). It is worth mentioning that the implementation of such guidelines forces bank supervisors to check that banks are correctly using the reference taxonomy.

As of June 2019, 38 emerging market economies are member of the Sustainable Banking Network (SBN) set up in 2012 by the International Financial Corporation to promote, among other things, green lending. Out of these 38 countries, 22 have developed national sustainable finance policies and principles. Among those, 15 have issued Green finance product guidelines[103]. The various green finance guidelines differ across countries but usually comprise a framework for environmental risk assessment as well as orientation for enhancing green finance[104].

98 UNEP Inquiry, "The Financial System We Need: Aligning the Financial System with Sustainable Development."
99 Bangladesh Bank, "Guidelines on Environmental & Social Risk Management (ESRM) for Banks and Financial Institutions in Bangladesh."
100 D'Orazio and Popoyan, "Fostering green investments and tackling climate-related financial risks."
101 U. Volz "On the Role of Central Banks in Enhancing Green Finance" UN Inquiry WP February
102 U. Volz
103 IFC and Sustainable Banking Network, "Global Progress Report of the Sustainable Banking Network."
104 U. Volz

China is a case in point. Campiglio mentions that the Chinese central bank "exerts a sort of soft power -called window guidance- on the banking system…to make sure that the allocation of credit across sectors follows the Central bank strategic plans." This allocation has favored low-carbon sector[105]. In addition, the China Banking and Insurance Regulatory Commission (formerly CBRC) published in 2007 'Green Credit Guidelines' stating that "banking institutions shall promote green credit from a strategic height, increase the support to green, low-carbon and recycling economy, fend off environmental and social risks, and improve their own environmental and social performance." Volz indicates that "the Chinese experience has shown that such non-binding guidelines are not enough". In 2014, CRBC complemented the Green Credit Guidelines by introducing a Green Monitoring and Evaluation Mechanism and a key performance Indicators Checklist[106]. In 2016, China set out Guidelines for establishing the Green Financial System which aims at channeling more capital toward green sectors while restricting investments in polluting sector[107]. As the UNEP Inquiry put it, Chinese policies have "evolved from an initial principle-based approach in 2007 to a standardized, metrics-driven performance assessment of all licensed banks"[108].

Other countries have also set up green financing frameworks beyond Bangladesh already mentioned (see above). The Central Bank of Brazil has established industry-specific and thematic green banking regulations, including on the protection of the Amazon Biome, sugar cane investments and labor standards. Indonesia has launched a Sustainable Finance Roadmap which sets goals for financial players to address climate change and aid them expand investment in green and inclusive industries through schemes, practical guidance and development of green products. Other countries have focused on coordinating banking associations' initiatives and voluntary, industry-led initiatives. The use of E&R risk management standards, as the IFC's Performance Standards recognized as a benchmark or the Equator Principles which define roles and responsibilities of lenders and borrowers, has become more common. Mexico has a carbon tax in operation but also developed a voluntary Sustainability Protocol to provide guidance on E&S risk management and sustainable lending, a plan for capacity building and tools for implementation[109].

National Sustainable Finance Roadmap[110] is a tool which may be considered as a specific type of guideline as in the case of Indonesia. National roadmaps have also been adapted by other countries around the world such as Argentina, China, Italy, Mongolia, Morocco, Nigeria, Singapore, South Africa and more recently the UK (UK Green Finance Strategy). This tool helps countries to set a long-term plan to develop a sustainable financial system according to the country's priorities. With the roadmap, countries have also started to link the transformation of the financial system to broader sustainable development goals. Even though roadmaps considerably vary across countries, they all include two main objectives: enhancing the capacity of the system to integrate ESG factors into the decision-making process and mobilizing predominantly private capital for sustainable development. In general, these roadmaps encompass several broad components: identifying the narrative, assessing overall needs, estimating necessary flows, identifying potential barriers, aligning with international experience, building scenarios, identifying suitable measures, sequencing of measures and priorities, building capacity and measuring progress.

As there is no single formula to design a national sustainable roadmap, its implementation might not be as simple and wide as desired. The roadmap needs to be tailored to the country's priorities and level of the economic and financial markets development. For this reason, the development of a general framework is highly necessary but would only provide overall orientation for designing the tool. A Sustainable Finance Diagnostic Toolkit has been developed by UN Inquiry and facilitate the start of the process, but supplementary guidance is still needed to expand the use of the roadmaps by other nations.

Similar instruments do not exist in developed economies where financial regulation is focused on financial stability.

Section 3 has reviewed 6 categories of regulatory instrument, with different expected outcomes and specific implementation challenges. **Table 1** provides a summary of this review.

105 Campiglio, "Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy," January 2016.
106 U. Volz "On the Role of Central Banks in Enhancing Green Finance" UN Inquiry WP February
107 Green Finance Platform "China's Guidelines for Establishing the Green Financial System" 2016 https://greenfinanceplatform.org/financial-measures-database/chinas-guidelines-establishing-green-financial-system
108 UNEP Inquiry, "The Financial System We Need: Aligning the Financial System with Sustainable Development."
109 The World Bank and Sustainable Banking Network, "Greening the Banking System: Experiences from the Sustainable Banking Network."
110 Munzele Maimbo and Zadek, "Roadmap for a Sustainable Financial System."

TABLE 1 - EXPECTED IMPACTS AND IMPLEMENTATION CHALLENGES OF REGULATORY INSTRUMENTS

Instrument	Expected Impacts	Implementation challenges
1. Increase Awareness		
1.1 Signaling	Increase awareness of financial institutions' governance	All financial regulators and supervisors within one jurisdiction need to be willing to act
1.2 Supervisory Engagement	Initial assessment of climate risk exposures and monitoring by FIs	Financial regulators and supervisors need to enhance their own capacity on climate risks
1.3 Research	• Initial assessment of sectoral climate risk exposure; • Financial regulators to contribute to the collective learning curve	• Data not consistent and not checked by supervisors; • Time is needed for financial regulator research efforts to develop and materialize
2. Enhance disclosure		
	• Non-financial corporates: help correct market failures; • Financial institutions: enhance market discipline	• Data availability; • Existence of a common taxonomy; • Common metrics and reliable methodologies to measure impacts and risks
3. Integrate climate change into fiduciary responsibility		
	Lead asset managers and asset owners to integrate climate change in their investment decision process	• Different rules across countries; • Preference for short-term profit maximization ; • Needs support from retail investors;
4. Ensure micro financial stability		
4.1 Pilar 1 - bank prudential rules	Banks to integrate climate risks into their risk management systems and increase their resilience	• Reliable methodologies to measure climate risks; • Current lack of international consensus (Basel Committee) to change prudential rules;
4.2 Pilar 2 – climate stress tests and supervisory review	• Banks to assess their resilience vis-à-vis climate change under stressed scenarios; • Allow banks' supervisory review to integrate climate change risks; • Provide forward looking scenario analysis	• Define relevant scenarios to be used by financial institutions; • Identify relevant climate risk drivers to be stressed and the relevant level of granularity; • Develop approaches to deal with the deep uncertainty of climate change and the discrepancy of horizons (between short term stress tests exercise and medium-long term climate risks)
5. Ensure macro financial stability		
5.1 Macro testing	Assess potential systemic risks resulting from climate change	• Integrate climate change in macroeconomic modelling; • Integrate second round effects
5.2 Countercyclical capital buffer	Enhance banks' capital to mitigate the build-up of systemic risk and reinforce bank's resilience to systemic risk	• Effectiveness of capital buffer against excessive credit growth to be better established; • Calibration of the capital buffer;
6. Channel credit from brown to green activities		
	• Help financial players to be aligned with the transition to a low carbon economy; • Incentivize allocation of capital on green activities	• Tensions between the economic policy objective and the traditional objectives of financial regulation; • Greenwashing/ Green bubble;

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4. Integrating climate change into financial regulation - Challenges and priorities

As shown in section 3, a variety of regulatory instruments could integrate climate perspective. How these instruments need to be combined to be the most effective? Which ones are available today for implementation and which one still need to be thought through given the difficulties to implement them?

4.1. The necessary balance between market discipline and prudential regulation

The integration of climate change into the financial regulatory framework needs to be realized through its two traditional pillars: proper market functioning and financial stability. These two pillars are based on different mechanisms: the former aims to improve 'market discipline' *i.e.* improving the functioning of market mechanisms to allow them to deliver expected outcomes; the later aims at directly targeting financial actors' behavior by setting prudential rules *i.e.* norms and requirements they need to meet, subject to sanctions. Given the market failures observed regarding climate change and the urgency of action, it is indeed necessary to use both pillars in order to correct market failures as well as bend financial actors' behavior in order to ensure the stability of the financial sector.

So far, when using financial regulation, the focus has been largely put on improving public disclosure regarding climate change or sustainability (see France Article 173-VI, the G20 initiative to create in 2016 the Task Force on Climate-related Financial Disclosure - TCFD or the EU Action Plan launched in 2018). Arguably, transparency is an important element to ensure proper market functioning by providing the market with relevant information on how environmental risks (notably climate-related risks) and opportunities are managed, and to what level corporates are exposed to these risks. But to be as fully effective as possible, market transparency requires mandatory and consistent disclosure based on data and proper methodologies. None of these conditions has been met in most cases (*e.g.* TCFD is a set of voluntary recommendations and Article 173-VI in France is compulsory but based on a "comply or explain" approach; regarding the content of disclosure, provisions are rather vague and non-prescriptive).

In the short term, the question is whether climate-related risks disclosure should be made compulsory. The EU with the upcoming regulation on disclosure and the announced revision of the Non-Financial Reporting Directive is heading toward this direction. At the international level, the NGFS does not go that far but "recommends that policymakers and supervisors consider further actions to foster a broader adoption of the TCFD recommendations and the development of an internationally consistent environment disclosure framework" [111]. In addition, this action for an internationally consistent disclosure framework should be accompanied with more specific guidelines in order to get more meaningful information than today. Technical works are carried out in the context of the TCFD implementation, but these works need to converge. At the European level, there still needs to be seen whether the on-going work by two European Supervisory Agencies (EIOPA and ESMA) on the so-called level 2 measures [112] to implement the Regulation on Sustainability-related Disclosure will result in more specific requirements for disclosure.

Full comparability of disclosure should be a medium-term target as consistency will require more time for robust and common methodologies to emerge.

But better transparency will not suffice to get a proper market functioning. When useful data are disclosed and available, they remain to be fully used by financial actors. For a part, they will have incentives to do so on their own, for instance to better assess the climate-related risks of their activities and understand how climate change will affect their business. But one could argue that regulatory provisions should enhance these incentives. In this respect, two elements are particularly important:

- the integration of environmental consideration in risk management by market players, be it asset owners or asset managers. This is an on-going move which should be generalized as much as possible at least with a principle-based approach;
- the integration of environmental sustainability in fiduciary responsibility could be a key change in market functioning. But as explained in section 2, this is quite a complex and debated issue which needs more time before contemplating the implementation of stringent financial regulation in this domain.

Regarding market functioning, one may consider that principle-based regulation should be privileged in the beginning since the conditions for rule-based regulations are not met yet (both at the technical level but also at the industry acceptability level). On the longer term, there will be a choice between the two approaches but arguably the rationale for rule-based regulation will become stronger.

Still, even with these three key elements of market functioning adequately addressed, one can doubt that it will be enough to push the financial sector to fully take into account climate change. Therefore, one could argue that prudential tools are required to support and accelerate the expected changes in behavior (particularly regarding risk management).

111 NGFS, "A call for action: Climate change as a source of financial risk,"
112 Regulatory Technical Standards are drafted by the European Supervisory Agencies as implementation provisions of directives

4.2. The short-term priorities for financial regulators

If there is no doubt that the prudential approach needs to complement the market functioning approach, it is necessary to acknowledge that integrating climate-related risks into the prudential regulation is not an easy task and will require some time to be fully achieved. In the meantime, it is key that regulators and supervisors start taking actions using as much as possible existing regulations and tools at hands. It is fair to recognize that the NGFS has decided to follow this approach since its creation in December 2017.

These short-term priorities should already cover a large array of actions:

- Improving awareness among financial players through speeches, events and studies. As already mentioned, central banks and financial regulators/supervisors have an efficient "messaging power";
- Using the supervisory dialogue to lead financial institutions to change their behavior vis-à-vis climate-related risks notably at the management level and within Risk Departments;
- Accelerating the convergence of approaches and methodologies to assess and measure the climate-related risks or the alignment with reference scenarios (*e.g.* 2°C scenario). This is a domain where much R&D is needed and cooperation among the financial actors could accelerate the process;
- Set clearly their supervisory expectations for supervised entities (banks, insurance companies and asset managers) regarding their strategy, governance and risk management vis-à-vis climate change;
- Work with the financial industry on scenario analysis and stress testing to use them in the current regulatory framework (as previously seen, Basel III without being explicit leaves enough room for this);
- Develop good practices and monitor the development of new products (*e.g.* low-carbon indexes or funds, climate or transition bonds) and new instruments (*e.g.* carbon compensation at portfolio level).

Some of these actions raise enforcement challenges for supervisors. For instance, regarding the enforcement of climate reporting, to what extent supervisors are expected to ensure the quality and meaning of information, what is the role of external insurance and what kind of sanctions should be used?

All these actions are within the current mandate of most financial regulators and supervisors and could be carried out in the current international framework (Basel III for banks). In the short term, soft regulation and supervisory practices should be privileged. While most of these actions can be carried out at the national level, international cooperation or coordination should be encouraged (*e.g.* at the EU level or within informal networks such as the NGFS or the IAIS-SIF) to better understand risks and develop converging practices.

4.3. The conditions for integrating climate-related risks into prudential regulations

As soon as possible, new supervisory practices must be supported by regulations which appropriately integrate climate-related risks. This integration is necessary if one wants to increase the pressure on financial players through stringent prudential requirements (*e.g.* capital or liquidity requirements) or even through the current tools (*e.g.* the actual capacity of supervisors to require additional capital on the basis of climate stress tests remains unclear). Such integration of climate-related risks into the prudential regulation would take time. In particular, two main difficulties must be overcome: i) international and European cooperation on regulatory standards and ii) consensus on metrics and methodologies.

4.3.1. Prudential regulation is set at the international level

A distinction must be done according to the nature of prudential regulations. Regarding principle-based regulations (*e.g.* governance and risk management, supervisory process, stress-tests), international standards have not yet integrated climate-related risks. But as long as these risks are considered material for the supervised entities, the national supervisors have some room to take them into consideration when carrying out their supervisory functions.

However, it would be quite difficult to impose new rule-based prudential regulations (*e.g.* capital or liquidity requirements) at the national level without any international cooperation, particularly for global financial institutions. Indeed, these institutions are keen to keep a level playing field at the international and at the European level. If one takes the example of banks (but the outcome would be the same for other supervised financial institutions), international cooperation on this matter is still hampered.

At the international level, the framework for bank prudential regulation is set by the Basel Committee for Banking Supervision (BCBS) under the auspices of the Financial Stability Board, a G20 body. The BCBS is the international standard body in this domain although it has no international legal standing and no regulatory power. However, the international consensus built within the BCBS, the G20 backing and the international banks' demand for level playing field have so far been able to impose the successive BCBS Accords as de facto international standards. Therefore, it would be necessary that the Basel Committee takes on the issue of climate change to undertake its full integration in

the international regulatory framework. However, as G20 countries were divided regarding the necessity to act on climate change, this was no longer an issue on the agenda of the FSB or the BCBS. The setting of the NGFS was pretty much a response from a group of 'willing regulators' to circumvent this 'political deadlock'. The momentum created by the NGFS is impressive (see the number of members and observers coming from 8 to close to 50) but it remains to be seen whether it would be enough to get the international regulatory framework evolving. However, the situation might be evolving in a positive direction. Thus, the Basel Committee decided on March 2020 to set a new Taskforce on Climate-related Financial Risks under the Chairmanship of representatives from the Dutch central bank (DNB)[113] and the US FED (Federal Reserve Bank of New York). This is clearly a signal that the Basel Committee has decided to become more involved in discussion regarding climate-related risks.

At the EU level, the regulatory framework is set by the Commission (with the political endorsement of both the European parliament and the Council of Member States), and the ESAs adopt the technical provisions for implementation of EU rules. There is political support to integrate climate change and environmental issues in financial regulation as demonstrated by the EU Action Plan issued in March 2018. Therefore, there is room for maneuver to establish new climate-related rules for European financial institutions as recently demonstrated (*e.g.* Disclosure regulation or mandate given to the ESAs to integrate ESG criteria into the governance and risk management of supervised institutions). However, it is constrained by the Basel Committee framework when it comes to changing banks' rule-based prudential regulations, and particularly to strengthening capital requirements.

4.3.2. The need for widely accepted metrics and methodologies

Another key difficulty to overcome before setting more stringent rule-based regulation comes from the need to have common metrics and methodologies to assess climate-related risks (as for example it was the case regarding credit risk measure in the 1990s before the Basel Committee was able to agree on international standards for credit risks). We are still not at this stage and the objective is quite challenging.

The difficulties to be addressed are quite challenging:

- What climate and transition scenarios to consider when assessing the climate-related risks that financial players are facing? The NGFS is currently working on this issue and is planning to provide national regulators with guidelines on how to build relevant scenarios[114]. Still, passing from high level narratives to detailed scenarios remains complex[115].
- How to deal with the 'deep uncertainty' inherent to climate change[116]? This is still a question which is not correctly addressed by research.
- How to integrate medium and long-term climate-related risks in prudential regulations which usually consider risks at shorter horizons (1 year or at most the business cycle horizon 3-4 years)? The so-called 'tragedy of the horizons' refers to this inability of current risk management practices and tools to integrate longer time horizons.
- How to collect necessary data to feed new methodologies (*e.g.* asset localization, scope 3 emissions)?

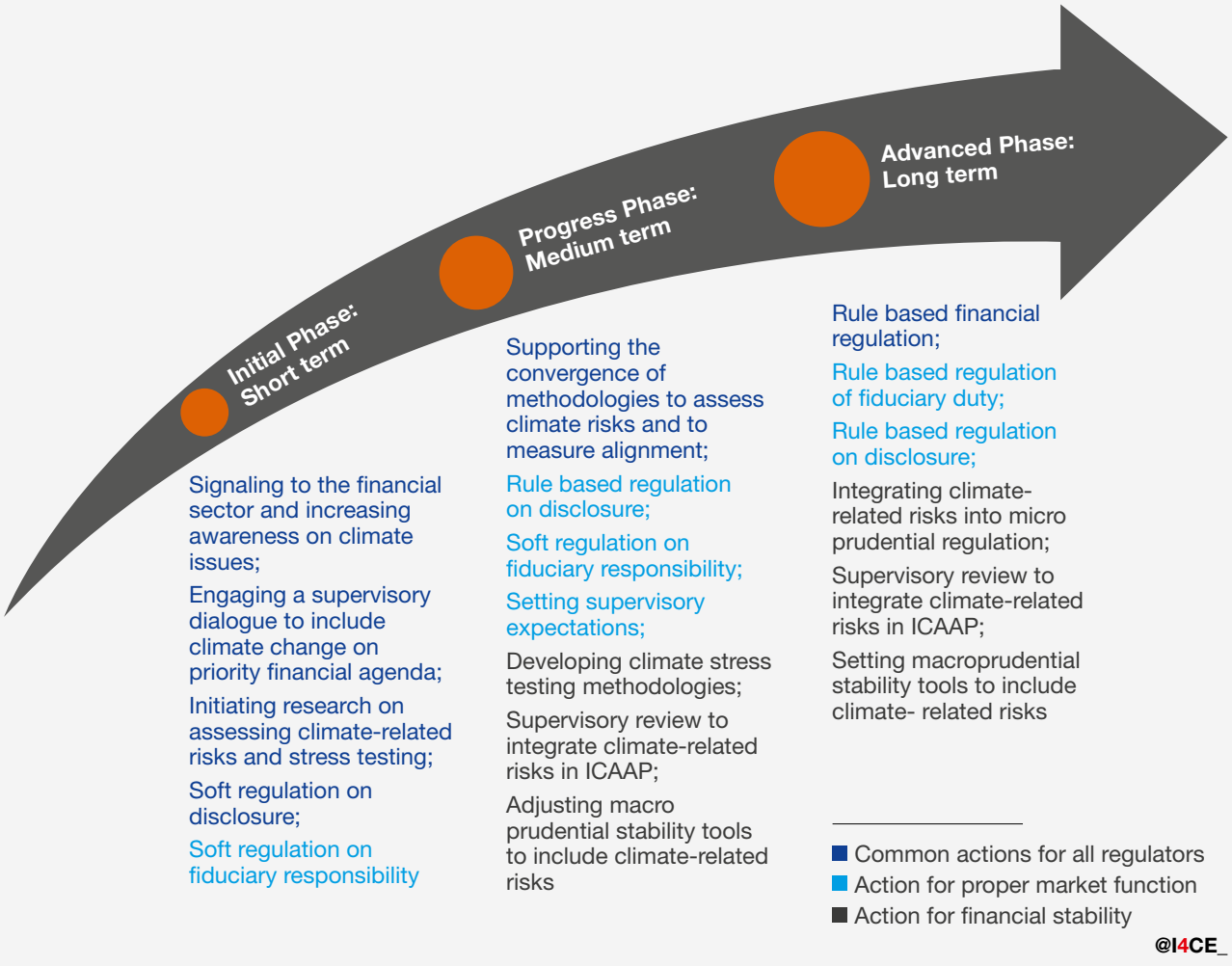
Overcoming these difficulties is an on-going work which will take some time to be completed. It will be very difficult to integrate climate-risks into rule-based regulation before this challenge is met.

Section 4 has presented some of the issues under discussion when integrating climate change challenges in financial regulation. The necessary combination of complementary regulatory tools as well as the necessary steps to follow before implementing others lead to sketch a recommended timeline of actions for ensuring proper market functioning and financial stability (see Figure 5).

113 It is noteworthy that Frank Elderson is also the chairman of the NGFS
114 NGFS, "A call for action: Climate change as a source of financial risk," April 2019.
115 See for instance I4CE: Colin *et al.* "Understanding transition scenarios - Eight steps for reading and interpreting these scenarios."
116 See for instance I4CE: Depoues *et al.* "Towards and alternative approach in finance to climate risks: taking uncertainties fully into account"

FIGURE 5

TENTATIVE TIMELINE FOR REGULATORY TOOLS



4.4. The debate regarding the use of financial regulation for shifting the investments

Granting financial regulators with the responsibility to help channel financial flows away from 'brown activities' to 'green activities' is a much-debated proposal (see Section 2.3).

In order to make the debate going forward, it is necessary to address a series of questions.

The **first question relates to the rationale of using financial regulation to pursue economic policy objectives.**

As seen in a previous section, some authors consider that, given the urgency of taking actions against climate change, financial regulators should substitute to the economic and fiscal policy that governments do not want or cannot implement. For instance, P. d'Orazio considers: "attention is too much focused on the impact of the green transition on the financial stability whereas the effects of macro prudential policies on the green structural change are often overlooked. Financial authorities can play a potentially important role in leading the transition to a low-carbon economy"[117].

Conversely, other authors consider that financial regulators do not have the political legitimacy to carry such a responsibility to compensate for a government failure. Financial regulators in developed economies feel strongly that way as seen in section 3. Like central bankers of developed economies, they want to stick to a 'market neutrality' approach.

But another way of addressing the rationale issue – maybe less contentious – is to ask whether financial regulation could complement economic policy measures instead of substituting them. For instance, could financial regulation

117 D'Orazio and Popoyan, "Fostering green investments and tackling climate-related financial risks."

deal with market failures or individual financial institutions' behavior which could not be effectively addressed by economic policy instruments? As several market failures slow down the necessary shift from financial flows from brown to green activities and given that financial regulation is meant to address these market failures, there could be a case to use financial regulation for broader objectives than its traditional objectives. In order to build the case, it would be necessary to identify these market failures which could not be correctly addressed by fiscal or environmental policy measures. Further research would be required in this field.

The **second question relates to the possibility of conflicting objectives** between the traditional mandate of financial regulators (financial stability and proper market functioning objectives) and a new economic policy mandate. Indeed, financial regulators have been charged by public authorities with the responsibility to safeguard the safety of the financial system. If they were given additional responsibilities, the governance for potential conflicting objectives should be carefully designed. A similar concern is voiced by Volz when saying that "Central Banks should not be over-burdened; they are not always the institutions best placed" [118]. Potential conflicts could also arise between the investor protection objective and a proactive promotion of green investments. This conflict of interest should be carefully considered.

Finally, there is the question of **central banks and financial regulators' mandate and accountability**. Volz considers we should refrain from "vesting too much power in unaccountable institutions" [119]. Volz summarizes well the nature of the debate: "Whether central banks should also play a promotional role to support green investment is fundamentally a political question that requires careful consideration" [120]. The same could be said of financial regulators and supervisors which are quite independent from political authorities. All this debate boils down to the question regarding the mandate of financial regulators: contrary to many emerging market economies, in most developed economies financial regulators are not charged with broad economic or societal responsibilities.

This debate has not really taken place in most developed countries where the current mandate of financial regulators has strong political support. Dikau and Volz show that current mandates of central banks are broad enough to integrate climate change into their monetary strategy and their financial stability function. However, among 133 institutions under review, only 16 had explicitly mentioned in their mandate 'sustainability' issues [121]. For the other central banks, there is not much room to use their powers to promote a sectoral allocation of credit. A similar review should be carried out for financial regulators' mandate in order to assess them on a case-by-case basis. Indeed, the situation varies across institutions: some authorities have the capacity to integrate sustainabilty objectives in financial regulation (*e.g.* the European Commission) whereas it would be much more controversial for others (*e.g.* the Basel Committee for Banking Supervision which is de facto the international standard setter for international banks).

118 Volz, "On the Role of Central Banks in Enhancing Green Finance."
119 Volz.
120 Volz.
121 S. Dikau and U. Volz « Central bank mandates, sustainability objectives and the promotion of green finance" SOAS Economic Working Paper, No. 222, SOAS University of London

Conclusions

Financial regulation is too often considered as a technical question which is better left in financial regulators' hands. The report aims to clarify the stakes and the challenges to address in order to facilitate the public debate; it aims to provide public and private decision markers with analytical insight to feed the necessary dialogue between all stakeholders on financial regulation.

The report analyses first the role the financial sector is expected to play in financing the low-carbon transition in a context of urgency to fight against climate change. The report notes the financial sector has not fully delivered so far. There is still a large investment gap – despite the development of Green Finance – and financial institutions have not addressed climate related risks. For a variety of reasons belonging to both the economic and financial environment, the financial sector has not sufficiently transformed its business model to finance the low-carbon transition to the level needed and manage risks so that it will be able to play its role without being itself endangered by climate change.

Against this background, the report shows there is a strong rationale to consider that financial regulation needs to push the financial sector to swiftly address climate change challenges and efficiently play its role. In most countries, this is no longer a debate and there is a broad consensus to consider financial regulation has a key role to play.

However, a series of questions are still open:

- What are the available regulatory instruments? The report reviews a large array of potential regulatory instruments which are either already used in some jurisdictions or could potentially be used. But in many cases, implementation challenges exist and would request time to be overcome, particularly to take into account the radical uncertainty of climate change to accurately measure climate-related risks.
- What is the right balance between the two traditional pillars of financial regulation (enhancing market discipline and ensuring financial stability)? The focus has so far been put on improving disclosure to help financial markets better assess climate risks and corporates' exposures. However, there are reasons to consider that disclosure – while being key – is not enough and needs to be complemented by prudential regulation to push financial actors to integrate climate related information in their risk management processes.
- What is the most appropriate sequence for implementing these regulatory instruments? There is no simple answer because the choice of relevant instruments depends also on national circumstances, particularly the level of awareness and technical expertise of financial regulators and supervisors (in some cases, the first step is to convince them). Besides, there is a natural continuum of instruments to be used from raising awareness and supervisory engagement to soft regulation toward rule-based regulation. But financial regulators have enough instruments to act on the short term and these actions can be engaged within their mandate because they relate to market functioning or financial stability. Beyond these short-term priorities, they must actively prepare the following steps which will require technical pre-conditions to be met or political support to be gathered.
- Should financial regulators follow other objectives than traditional ones such as proper market functioning and financial stability? Should they also pursue economic policy objectives such as channeling credit away from brown activities toward green ones? This is a controversial question in developed economies which is as 'technical' as 'political' as it raises the question of financial regulators' mandate vis-à-vis economic development.

One key issue has not been touched upon in this report: what are the real impacts of these various instruments? Would they really deliver the expected outcomes? This is indeed key to really make informed decisions. Dikau (2019) notes their impact should be assessed in terms of effectiveness, efficiency and fairness from both a finance perspective and a sustainability perspective[122]. However, the answer to this question is quite complex to provide and such an assessment was far beyond the objective of this report. In addition, only some of these regulatory instruments have been used and in most cases for a short period of time. There is then few empirical evidences to draw lessons from. This is clearly a domain where further research is warranted to help decision-makers. In the short term, an initial qualitative assessment of impact could be carried out (*e.g.* the TCFD recommendations or principle-based regulation on climate disclosure such as the Article 173-VI in France). Beyond, the research would need to draw on broader datasets, such as for instance the Green Finance Measures Database (launched at the COP25 by the Green Growth Knowledge Partnership and the UNEP Inquiry) which maps almost 400 national and sub-national policy and regulatory measures on green finance around the world.

Another issue which would need further research is the role that private financial actors could play in developing a financial regulatory framework aligned with the objectives of the low-carbon transition. Financial regulators cannot address this challenge without an important input from financial actors themselves. There is a clear case for cooperation between financial regulators and private actors to be able to address this challenge as quickly and as efficiently as possible.

122 S. Dikau *et al.*"Building a sustainable financial system: the state of practice and futures priorities"

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