

FINANCE AND CLIMATE CHANGE

A PROGRESSIVE GREEN FINANCE STRATEGY FOR THE UK

Report of the independent panel commissioned by
Shadow Chancellor of the Exchequer John McDonnell MP



Finance and Climate Change

- A Progressive Green Finance Strategy for the UK -

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| | |
|--|----|
| FOREWORD | 2 |
| ACRONYMS | 3 |
| EXECUTIVE SUMMARY | 4 |
| 1. INTRODUCTION | 8 |
| 2. CLIMATE CHANGE AND THE UK FINANCIAL SYSTEM: AN OVERVIEW | 10 |
| 2.1 The climate footprint of the UK financial system | 10 |
| 2.2 Climate-related financial risks | 15 |
| 2.3 Climate-related financial disclosures | 19 |
| 2.4 The UK government Green Finance Strategy: market-led, too much carrot, too little stick | 23 |
| 3. SETTING THE STAGE FOR THE GREENING OF THE UK FINANCIAL SYSTEM: TAXONOMY AND FINANCIAL DISCLOSURES | 25 |
| <i>Recommendation I: Develop a green/brown public taxonomy</i> | 25 |
| <i>Recommendation II: Make climate-related financial disclosures mandatory</i> | 28 |
| <i>Recommendation III: Set up the Green Finance Taskforce (GFAT)</i> | 29 |
| 4. GREENING MONETARY POLICY AND BANKING REGULATION | 30 |
| <i>Recommendation IV: Green the mandate of the Bank of England by re-interpreting and/or modifying it</i> | 30 |
| 4.1 Monetary policy | 31 |
| <i>Recommendation V: Green the collateral framework of the Bank of England’s Monetary Policy Operations</i> | 31 |
| <i>Recommendation VI: Use the NIB to steer bank credit towards low-carbon projects</i> .. | 32 |
| <i>Recommendation VII: Green the Bank of England’s Corporate Bond Purchase Scheme</i> | 33 |
| 4.2 Banking regulation | 34 |
| <i>Recommendation VIII: Adopt Climate Calibrated Capital Adequacy Rules</i> | 34 |
| 5. GREENING SHADOW BANKING THROUGH ROBUST REGULATION | 37 |
| <i>Recommendation IX: Extend the mandatory climate-related financial disclosures to non-bank financial institutions</i> | 40 |
| <i>Recommendation X: Encourage the introduction of green supporting and brown penalising haircuts and margins for market-based finance</i> | 42 |
| <i>Recommendation XI: Encourage the introduction of a brown penalising factor for Global Systemically Important Banks</i> | 43 |
| Conclusions | 44 |

FOREWORD

The two defining challenges of our age are responding to the climate emergency and reducing the grotesque and growing inequalities in our society. Tackling these two challenges must go hand in hand – a just transition to a net zero carbon economy.

In the final weeks of Theresa May's premiership, the Government committed to a goal of reaching net zero carbon by 2050. There are good arguments to say that we should be aiming to deliver this goal even sooner and Labour Conference passed a motion committing the Party to, "in collaboration with the trade unions and the scientific community, work towards a path to net zero carbon emissions by 2030". However, even with a date of 2050, it is clear that the Government is completely lacking in a coherent and credible plan to deliver it. The actions simply don't match up to the scale of what is needed.

Nowhere is this truer than in the financial services sector. The Governor of the Bank of England Mark Carney has highlighted the risks and the need for action. But the analysis in our report demonstrates that the current financial and regulatory regime will not deliver the change needed anywhere near far enough or fast enough. This applies to both the regulated and the so-called shadow banking sector. Much more radical steps will need to be taken.

In our report we set out the actions needed to:

- Establish a much more rigorous classification (taxonomy) of what is regarded as 'green' and what is regarded as 'brown'.
- Ensure that the valuation of brown assets properly take account of the risks involved for those assets as moves to decarbonise the economy accelerate.
- Introduce regulatory and other changes that will more rapidly move investment and lending away from brown and towards green assets and activities.
- Ensure that private finance is more readily available for those businesses who want to advance the green agenda through innovation.

They are consciously more interventionist than the current regime because the sector will not get there on its own. The Treasury and the Bank of England need to lead the way. Some of the actions will require international collaboration, and the UK should take the lead in advocating change, but there is a great deal more that can be done by the UK without waiting for international action.

The focus of this report is on the financial and banking sector but there will also need to be a massive programme of investment by Government itself to deliver net zero carbon – part of what Labour has called its 'Green Industrial Revolution' - for example to improve the efficiency of our homes. This public investment must directly address the challenge of growing inequality as well as advance the green agenda. Investment in improving the energy efficiency of our housing, for example, will both contribute to tackling climate change and reducing fuel poverty.

The report is produced for debate and discussion, not as the final word. However those who challenge its recommendations need also to say how they would secure the change needed.

We cannot carry on as we are.

Sir Robert Kerslake

ACRONYMS

| | |
|-------|---|
| ABS | Asset Backed Security |
| BoE | Bank of England |
| CRD | Capital Requirements Directive |
| CPI | Consumer Price Index |
| CRR | Capital Requirements Regulation |
| DNB | De Nederlandsche Bank |
| EBA | European Banking Authority |
| EPC | Energy Performance Certificate |
| ESG | Environmental, Social and Governance |
| ESRB | European Systemic Risk Board |
| ETF | Exchange-Traded Fund |
| FCA | Financial Conduct Authority |
| FSB | Financial Stability Board |
| FTSE | Financial Times Stock Exchange |
| GFAT | Green Finance Taskforce |
| GHG | Greenhouse Gas |
| ICAAP | Internal Capital Adequacy Assessment Process |
| IPCC | Intergovernmental Panel on Climate Change |
| LCR | Liquidity Coverage Ratio |
| MSCI | Morgan Stanley Capital International |
| NGFS | Network for Greening the Financial System |
| NIB | National Investment Bank |
| PRA | Prudential Regulation Authority |
| QE | Quantitative Easing |
| SFTs | Securities Financing Transactions |
| SME | Small and Medium Enterprises |
| TCFD | Task Force on Climate-related Financial Disclosures |
| TFS | Term Funding Scheme |
| TPI | Transition Pathway Initiative |
| UN | United Nations |

EXECUTIVE SUMMARY

The rapid decarbonization of the UK economy requires a wider range of policies, from fiscal interventions to a green industrial strategy, a green plan for a National Investment Bank and environmental regulations that will restrict carbon-intensive consumption. These policies need to be accompanied by a rapid transformation of the UK financial system.

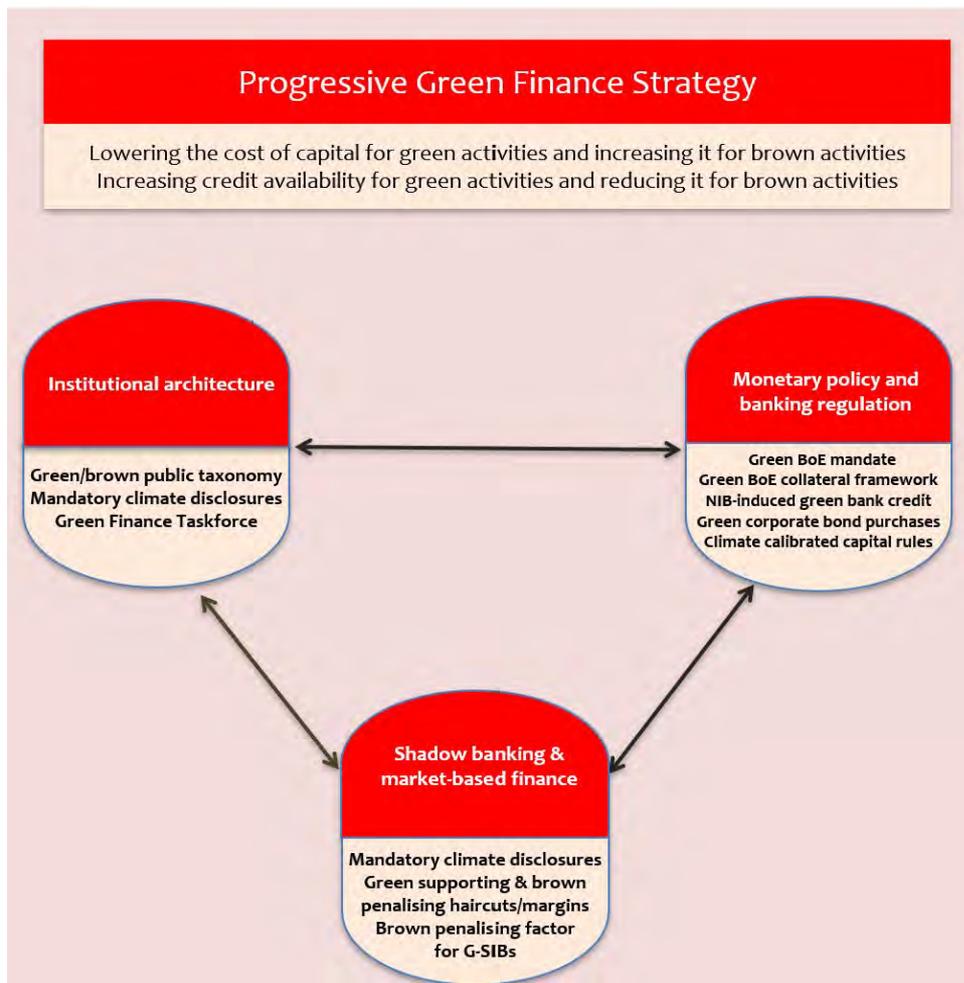
The UK's official Green Finance Strategy, published by the Conservative government in July 2019, does not go far enough. It offers a *market-led, too much carrot, too little stick*, deregulated decarbonisation approach. Yet an ambitious transition to low-carbon will not take place via the market because of a series of market failures that include incompatible time horizons between private finance and climate crisis, incomplete capital markets, corporate market power, and subjective private classifications of green assets. To climate-align private finance, we offer a set of recommendations that aim to (i) establish a robust institutional framework, (ii) green Bank of England/commercial banking and (iii) green shadow-banking/market-based finance (see Figure 1).

Recommendation I: Develop a Green Public Taxonomy. An ambitious green finance agenda needs a clear description of what counts as green and what does not. The increasingly popular Environmental, Social and Governance (ESG) private sector approaches suffer from significant shortcomings that open the door to greenwashing. Instead, we suggest a public taxonomy, developed by a UK Technical Expert Group and building on the European Commission's taxonomy, that identifies economic activities with different degrees of greenness and brownness. The analysis of climate-related financial risks and climate stress-tests should continue in parallel with the development of the Taxonomy.

Recommendation II: Make firms disclose the climate impact and risks of their activities. There are two types of information that should be disclosed. First, the degree of greenness and brownness of the financial assets held by financial and non-financial corporations should be disclosed based on the Green Public Taxonomy. Second, it is important that disclosure extends to the transition and physical climate risks facing institutions. These risks could be disclosed based on methodologies that are being developed by TCFD and NGFS.

Recommendation III: Set up the Green Finance TaskForce (GFAT). Working towards a path of net-zero emissions by 2030 is a challenging task. Green finance policies should be coordinated with other climate policies (green fiscal, industrial) such that the reduction of emissions will be maximised and the economic disruptions caused by decarbonisation will be minimal. The Green Finance Task Force will closely monitor progress in greening private finance, take actions to tackle transition risks and respond dynamically to obstacles that stand in the way of reorienting private finance towards green activities.

Figure 1 A progressive Green Finance Strategy: outline of recommendations



Recommendation IV: Green the mandate of the Bank of England by making sure it captures climate risks. The Bank could adjust its operations to capture transition risks, since they threaten financial stability in the short/medium run, and to account for the longer-term physical risks hardwired into its monetary and prudential policies. Going further, the UK government could explicitly include environmental sustainability in the mandate of the Bank of England. A green re-interpretation or modification of the mandate would justify the active use of central bank tools for the decarbonisation of the UK economy.

Recommendation V: Turn the Bank of England’s monetary policy operations green. The Bank of England’s collateral eligibility criteria at the core of monetary policy operations are extremely powerful. To avoid biasing the allocation of capital towards carbon-intensive activities (i.e. creating better financing conditions for these activities), the Bank should climate-align its collateral framework by introducing climate-related criteria for collateral. It could exclude ‘super-brown’ loans or securities, and differentiate haircuts on green/brown assets, in a dynamic fashion and in consultation with the Green Finance Taskforce.

Recommendation VI: Use the National Investment Bank to steer bank credit towards low carbon projects. The UK banking system has a structural bias towards lending to property and financial sectors. In turn, green activities are often regarded as riskier. The Labour Party’s plans

to green bank credit via the National Investment Bank, regional development banks and Post Bank should address these structural issues.

Recommendation VII: Turn the Bank of England’s existing corporate QE scheme green. The Bank of England has been committed to keep the stock of corporate bonds purchases at £10 billion. Although the scheme is intended to be ‘market neutral’, it implicitly favours climate-intensive sectors. We suggest a climate-aligned approach to the reinvestment of the cash flows. Such an approach would induce the Bank to reinvest in green bonds or bonds financing activities with a low carbon footprint.

Recommendation VIII: Adopt risk rules for banks which factor in climate risk. Risk-weighted capital adequacy rules are a significant component of Basel III (and of CRD IV). Conventional risk weights neglect the climate impact of assets. We propose that risk weights account for the greenness/brownness of the assets that banks hold, based on the Green Public Taxonomy. The ‘climate-based risk weighting’ would allow for the addition of climate related regulatory measures (Climate Calibrated Capital Adequacy Rules) to CRD IV.

Recommendation IX: Make shadow banks disclose their climate risks as well as banks. Institutional investors and their asset managers are important actors for green finance agendas. Their shareholder power allows them to exercise significant influence over corporate policies, while their portfolio decisions influence capital allocation, particularly given the growing importance of index investing. However, their strategy to integrate ESG factors may delay efforts to green the economy and to make institutional investors’ portfolios resilient to climate risks. Instead we recommend mandatory disclosure according to the Green Public Taxonomy. In parallel, the Green Finance Taskforce should make the TCFD disclosure mandatory.

Recommendation X: Introduce climate factors in the shadow banking sector’s lending and derivative markets. While collateral lubricates market-based finance, margins and haircuts on collateral used in repurchase and derivative markets are currently set independently of the environmental impact of the underlying collateral. This mobilises credit to brown activities, and creates mark to market exposures, via collateral chains, to sudden, climate related shocks in the price and liquidity of those collateral securities. Margins and haircuts could be recalibrated on the basis of the greenness and the brownness of collateral assets deployed. The Green Finance Taskforce could play a leading role in advocating for the Financial Stability Board to move in this direction. Similarly, to reduce the potential for regulatory arbitrage via passive investment abroad, the Green Finance Taskforce could contemplate a Financial Transaction Tax on brown ETF shares. The Green FTT could use the framework of the European FTT to tax trading of ETF shares where those ETFs track brown equities or fixed income instruments.

Recommendation XI: Introduce a penalising factor for Global Systemically Important Banks funding polluting activities. Basel III identifies systematically important global banks that need to hold additional common equity Tier 1 capital, based on a number of criteria, such as size, complexity and interconnectedness. The brownness of the assets in which G-SIBs invest could be considered when setting the capital buffer. A brown penalising factor could be based either on risk considerations (since brown assets face higher climate transition risks) or more directly on the need for G-SIBs to play a more active role in the process of decarbonisation.

Overall, this report aims to provide a list of recommendations that can be the basis for a radical green transformation of the UK financial system. A significant feature of our proposals is that they promote green finance and penalise brown activities at the same time. Without penalising brown activities identified according to robust public taxonomies, green finance agendas risks opening the doors to significant greenwashing, with the attending financial stability risks. However, these recommendations should be considered just as a starting point. There are various details that need to be scrutinised by the UK Technical Expert Group and the Sustainable Finance Task Force before our plan about the greening of the financial system is fully implemented. Most importantly, our suggested financial and monetary policies will not be successful if they are not accompanied by a wide range of climate policies that will ensure a just transition to a net-zero carbon economy.

1. INTRODUCTION

The rapid decarbonisation of the UK economy cannot be achieved without the implementation of a wide range of radical policies that will ensure a just transition to a net-zero carbon economy. These policies include, for example, fiscal interventions that will support the development of a low-carbon infrastructure, a green industrial strategy, a green plan for a National Investment Bank and environmental regulations that will restrict carbon-intensive consumption. To kickstart its 'Green Industrial Revolution' Labour has already promised that it will undertake green government investment of £250bn over the next 10 years, raised through government bonds, and has been committed to further redirect investment towards decarbonisation through its policy on a National Investment Bank, regional development banks and Post Bank.¹

However, these policies will not be entirely successful if they are not accompanied by a radical transformation of the financial system. This transformation is essential not only because the existing financial system operates in a way that is environmentally harmful, but also because financial markets and financial institutions can contribute to the financing of climate mitigation and adaptation activities. Moreover, if the financial system does not rapidly become aligned with the restrictions posed by climate, it is more likely to be severely hit by climate-related shocks and processes. This would exacerbate the economic and social effects of climate change.

The transformation of the UK financial system should take place through the adoption of a global perspective. This is necessary for at least two reasons. First, many financial institutions that operate in the UK have important overseas activities and are linked with the global financial system through a wide range of financial interconnections and shadow banking instruments. Therefore, UK-oriented interventions would not be enough to properly decarbonise UK finance.

Second, through its past carbon-intensive production and environmentally harmful consumption patterns, the UK has contributed significantly to the accumulation of greenhouse gases in the atmosphere. In other words, the UK is highly responsible for the change in the climate system, which is increasingly affecting much more severely the countries of the Global South than the countries of the Global North. The greening of the UK financial system and the implementation of other climate policies should therefore take place in a way that will ensure that the citizens of the Global South will benefit from the adoption and development of green technologies in the UK. In addition, the UK government should take initiatives that would ensure that the Global South will be able to achieve climate mitigation and adaptation, free of neo-colonial approaches.

Although there is a growing consensus that the financial system should become climate-aligned, there is a wide range of ways by which this can be achieved in practice. The aim of this report is to set out a plan for a radical greening of the UK financial system, focusing on the key monetary and financial interventions that would lead to a fundamental transformation of the way that private finance tackles climate change. Our plan moves much beyond conservative

¹ See [John McDonnell speech on the economy and Labour's plans for sustainable investment](#), 24 June 2019 and [John McDonnell speaking at Labour Party Conference](#), 23 September 2019.

approaches, like the UK government's green finance strategy, which are inconsistent with the urgent need to decarbonise the UK economy. And although we acknowledge the importance of the recent initiatives that the Bank of England has taken to tackle the financial risks from climate change, we highlight that more fundamental transformations are necessary for the UK financial system to become aligned with the targets of the Paris Agreement.

A proper green transformation of the financial system requires the coordination of a wide range of policies (such as fiscal and industrial ones). However, it is beyond the scope of this short report to discuss this coordination in detail. This report does not also discuss the implications of the UK financial system for the Global South and it does not analyse non-climate environmental problems, like the loss of biodiversity. It also sets aside the issues specific to the insurance sector. These are important issues that should be the subject of a separate more detailed investigation.

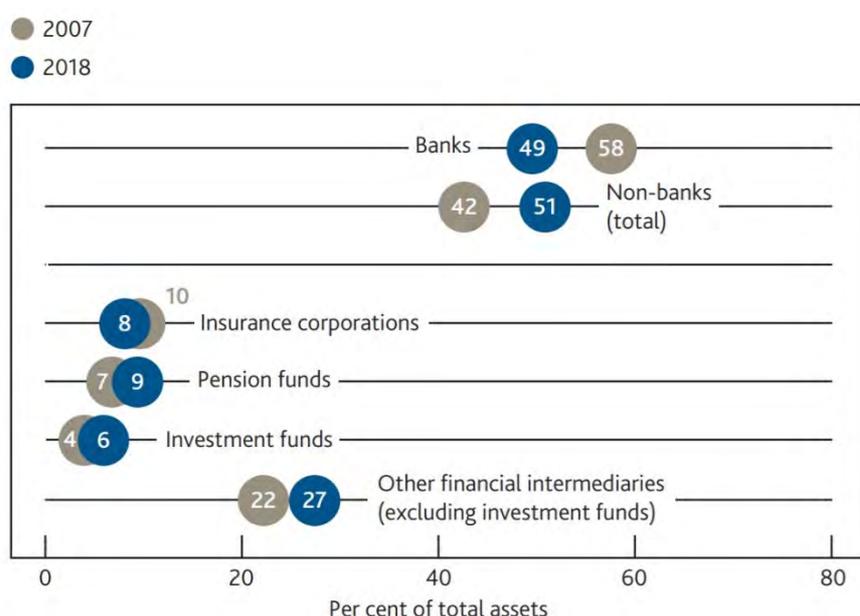
The report is structured as follows. Section 2 presents the climate impact of the existing financial system and outlines the climate-related risks posed to financial institutions. It also provides a brief critique of the green finance agenda of the government. Section 3 describes a set of broad recommendations that we perceive as prerequisite for the green transformation of the UK financial system. Section 4 presents some precise interventions through which monetary policy and financial regulation could become climate-aligned. Section 5 focuses on the broader changes that are necessary for the greening of shadow banking activities, emphasising the need for the UK to play a leading role in promoting these changes at the global level.

2. CLIMATE CHANGE AND THE UK FINANCIAL SYSTEM: AN OVERVIEW

2.1 The climate footprint of the UK financial system

The UK financial system contributes to the generation of carbon emissions primarily via the financing that it provides to the economy through bonds, stocks, loans and other financial instruments. The financial system consists of both banks and non-banks.² Banks include commercial banks and regulated investment banks that typically provide loans to firms and households. Non-banks include insurance corporations, pension funds, hedge funds, private equity, exchange-traded funds and investment trusts. The size of the assets of non-banks is almost equal to the size of the assets of banks (see figure 2.1).

Figure 2.1: Share of UK financial sector assets by subsector, 2007 and 2018



Source: Bank of England (2019). [‘Financial stability report’](#), Bank of England, July 2019.

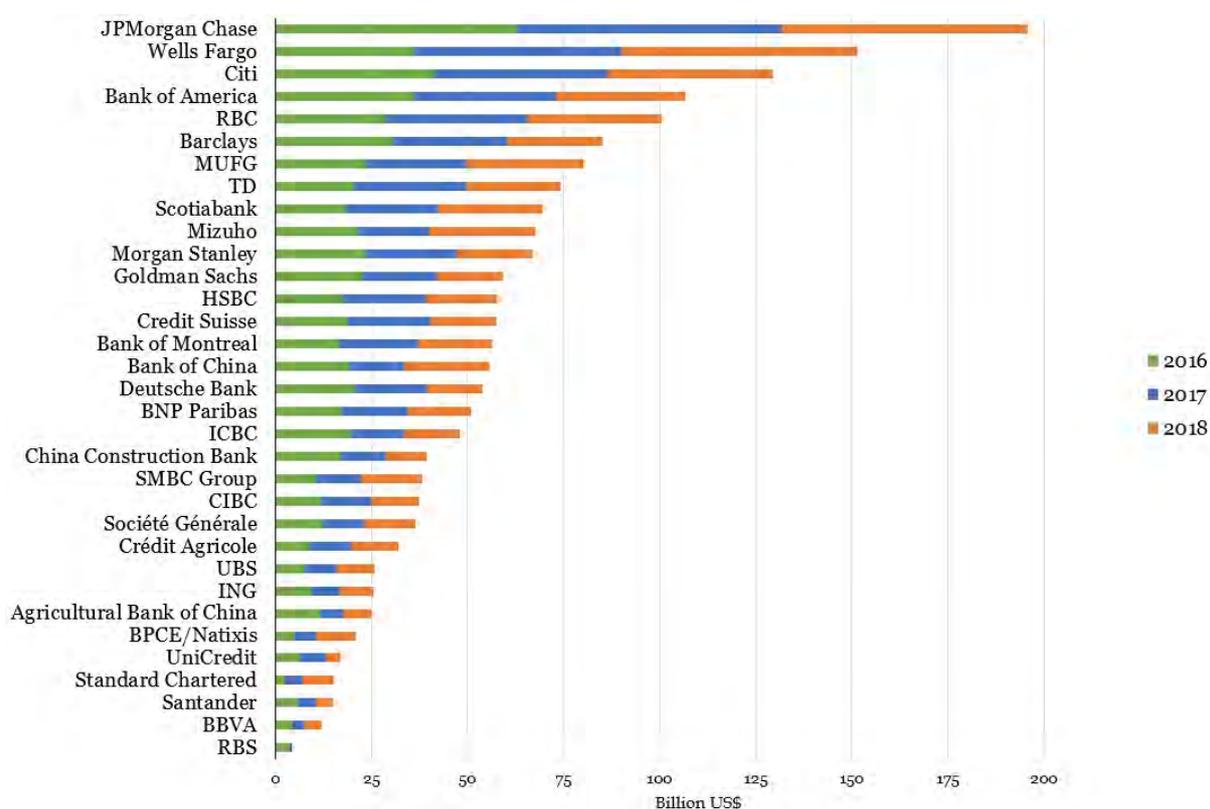
Carbon bias in the UK bank and non-bank activities

Banks around the world provide a lot of financing to fossil fuel activities. UK banks are not an exception to this. As shown in Figure 2.2, their fossil fuel financing during the period 2016-2018 was more than US\$100 billion.³

² Burrows, O. and Low, K. (2015). [‘Mapping the UK financial system’](#), Bank of England Quarterly Bulletin Q2, 114-129.

³ Nikolaidi, M. (2019). [‘Greening the UK financial system’](#), CommonWealth, 2019.

Figure 2.2: Bank financing of fossil fuels, billion US\$, 2016-2018



Source: RAN (2019). [‘Banking on climate change: Fossil fuel final report card 2019’](#), Rainforest Action Network.

Note: Fossil fuels include tar sands oil, Arctic oil and gas, fracked oil and gas, liquefied natural gas, ultra coal power and coal mining.

In addition, the carbon footprint of bank mortgages is particularly large. Residential housing accounts for around 14% of total UK Greenhouse Gas (GHG) emissions and about 72% of the UK’s homes have an EPC rating below C.⁴ House purchases rely to a large extent on mortgages, which constitute the biggest loan asset of UK banks. Of course, not all mortgages contribute directly to the generation of new GHG emissions: only those mortgages that are used to buy new houses do so. However, the mortgages that are used to buy existing energy inefficient houses also have an indirect contribution to GHG emission production.

Academic research shows that financial institutions, including UK related ones, have a large proportion of their assets in fossil fuel, utilities, energy-intensive, housing and transport sectors that are highly carbon-intensive. For example, the equity exposure of Blackrock, the largest asset manager in the world, to these sectors is equal to about \$1.4 trillion.⁵ By sustaining a high demand for high-carbon equity, financial institutions allow the companies that issue this equity to access the stock market at a low cost. Insurance companies also contribute to climate

⁴ Bank of England (2018). [‘Transition in thinking: The impact of climate change on the UK banking sector’](#), Bank of England Prudential Regulation Authority, September 2018.

⁵ Battiston, S., Mandel, A., Monasterolo, I., Schütze, F. and Visentin, G. (2017). [‘A climate stress-test of the financial system’](#), Nature Climate Change, 7 (4), 283-288.

change since many of their assets seem to correspond to liabilities that have been issued by carbon-intensive sectors. Note that the total investment portfolio of UK insurance companies was just over two trillion for 2017, while the total value of written insurance premiums was \$335bn in 2017 - making it the largest insurance industry in Europe and fourth largest in the world.⁶

Interestingly, recently some UK banks announced that they will stop funding fossil fuel companies, such as coal mines and coal plants.⁷ There are also some insurance companies, such as Aviva, that have reduced their holdings to companies that are linked with coal revenues. However, this divestment needs to be done by other banks and insurance companies as well, and in a consistent way in order to reduce the overall carbon bias of the UK financial system.

Carbon bias in financial regulation and the Bank of England operations

Several aspects of the Bank of England's operations are relevant for climate change.

The first is its collateral framework, which determines which assets can be used as collateral when commercial banks receive liquidity from the Bank of England. The eligibility criteria have mainly to do with the credit quality and maturity of the assets.⁸ Since credit rating agencies do not include climate risks in their assessments, climate risks are not considered when eligibility is decided.⁹ This means a misalignment of the collateral framework with climate issues.

The second is the Term Funding Scheme (TFS). This was introduced in August 2016 in order to provide long-term liquidity to banks and building societies at a low rate, close to the bank rate, under the condition of eligible collateral.¹⁰ Banks that were able to use the TFS could borrow at a lower rate, given that they provided lending to households and firms. So, similarly to the collateral framework, the TFS has a carbon bias since the eligible collateral must qualify the criteria that the Bank sets. On top of it, the TFS does not distinguish if the lending that is provided to firms or households finances carbon-related activities or not.

The third operation is corporate quantitative easing. The Bank of England has over the last years bought corporate bonds in order to increase the demand and reduce the yield and the cost of borrowing for the corporations that issue these bonds. This programme also targeted at decreasing yields of bonds more broadly, through portfolio rebalancing. It was overall intended to achieve the target for inflation since lower bond yields can stimulate investment. Empirical evidence has shown that this corporate QE programme has supported much more those sectors that have a higher contribution to the generation of greenhouse gas emissions

⁶ <https://www.statista.com/statistics/217257/leading-countries-by-life-and-nonlife-premiums-written/>

⁷ IEEFA (2019). [‘Over 100 global financial institutions are exiting coal, with more to come: Every two weeks a bank, insurer or lender announces new restrictions on coal’](#), Institute for Energy Economics and Financial Analysis, February 2019.

⁸ Bank of England (2019). [‘Sterling monetary framework, summary of collateral eligible for the Bank's operations’](#), Bank of England, 6 February 2019.

⁹ Monnin (2018). [‘Central banks should reflect climate risks in monetary policy operations’](#), SUERF Policy Note No. 41.

¹⁰ Bank of England (2018). [‘The term funding scheme: Design, operation and impact’](#), Bank of England Quarterly Bulletin Q4, 1-8.

rather than those that are less environmentally harmful.¹¹ In other words, it was not ‘neutral’ with respect to the sectors of the economy that it supported¹².

Finally, the Bank of England has a responsibility to regulate financial institutions. The Capital Requirements Directive (CRD) IV covers the rules that banks, building societies and investment firms need to abide by.¹³ These rules refer, among other things, to the capital and liquidity that these financial institutions need to hold. However, liquidity and capital requirements create potentially some barriers to the financing of green activities. For example, the Net Stable Funding Ratio (NSFR) induces regulated financial institutions to hold liquid assets in order to cover unstable sources of funding in a medium term horizon. Since green assets are typically less liquid than conventional ones, the cost of financing of green activities is potentially adversely affected by NSFR.¹⁴

The implicit carbon bias in Bank of England’s operations is a historical legacy that the institution has taken recent steps to address. Its leadership in new initiatives that contribute to the transition to a low-carbon economy is well recognised. The Bank has supported the development of methodologies that measure climate-related risks¹⁵ and is considering these risks as part of the Bank’s approach to prudential regulation.¹⁶ The Bank has also been part of the Network for Greening the Financial System (NGFS) that was established in 2017.¹⁷ NGFS is a group of central banks and supervisors that, through the exchange of experiences and best practices, aims at contributing to the development of approaches for managing climate risk in the financial sector and to the mobilisation of finance for the support of the transition to a low-carbon economy. NGFS has three workstreams (WS): WS1 that focuses on microprudential issues and supervision, WS2 that analyses macrofinancial issues around climate change and WS3 that aims to support green finance.

The Bank has also announced that they intend to disclose the way that they manage climate-related risks¹⁸ and that they will conduct climate stress tests for the UK economy. In addition, the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) have recently launched the Climate Risk Forum that has as an aim to share good practices between

¹¹ Matikainen, S., Campiglio, E. and Zenghelis, D. (2017). [‘The climate impact of quantitative easing’](#), Policy Paper, Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science.

¹² See also Turner, G., Rice, P. et al. (2018). ‘Financing investment: Final report’, GFC Economics and Clearpoint Advisors Limited, 22-26 and 178-181

¹³ Bank of England. [‘Capital Requirements Directive IV’](#).

¹⁴ D’Orazio, P. and Popoyan, L. (2019). [‘Fostering green investments and tackling climate-related financial risks: which role for macroprudential policies?’](#), Ecological Economics, 160, 25-37; D’Orazio, P., Popoyan, L. and Monnin, P. (2019). [‘Prudential regulation can help in tackling climate change’](#), Council on Economic Policies, February 2019.

¹⁵ See, for example, Bank of England (2019). [‘A framework for assessing financial impacts of physical climate change: A practitioner’s aide for the general insurance sector’](#), Bank of England Prudential Regulation Authority, May 2019.

¹⁶ Bank of England (2018). [‘Transition in thinking: The impact of climate change on the UK banking sector’](#), Bank of England Prudential Regulation Authority, September 2018.

¹⁷ NGFS (2019). [‘Network for Greening the Financial System: First comprehensive report: A call for action, climate change as a source of financial risk’](#), April 2019.

¹⁸ Bank of England (2019). [‘Bank of England to disclose assessment of how it manages climate-related financial risk in the 2019/20 annual report’](#), Bank of England, News release.

various financial institutions about disclosure, scenario analysis, risk management and innovation.¹⁹

Green banking, green assets and the green finance gap: recent trends

The estimated amount of investment that the UK needs from public and private sources in order to achieve the net zero emissions target by 2050 varies. According to some estimations, this might be, cumulatively, more than £1tn (£50-70bn per year).²⁰ This amount might increase sharply if the target is net zero emissions by 2030. Irrespective of the exact estimations, the UK financial system should provide a significant part of the low-carbon investment.

The progress that has been made in providing finance for 'green' projects and penalising 'brown' ones is slow. First, there are some initiatives by banks, including the UK ones, which intend to support green lending. For example, HSBC has announced its commitment to provide US\$100 billion by 2025 for the financing of the low-carbon economy, while Barclays has introduced the 'Green Loan' product in order to support firms with environmental objectives.²¹ Notably, there are six UK investment trusts that focus on renewable energy infrastructure, such as wind and solar.²² However, the pace of green lending remains slow and would not achieve net zero targets. Moreover, it is striking that some banks still provide a lot of financing to carbon intensive sectors, as was described above. In contrast, only a few banks, such as Triodos²³, fund exclusively green and socially responsible projects.

Second, UK investment banks have supported firms to issue green bonds. UK has one of the largest green bond markets in the world.²⁴ For example, Barclays has issued more than £16 billion of green bonds.²⁵ However, green bonds are only a small proportion of total global bonds.²⁶

Third, banks around the world provide lending at a low interest rate in order to facilitate the funding of green projects. For example, BBVA, a multinational Spanish bank with branches in the UK, sets interest rates depends on the Environmental, Social and Governance (ESG) score of the borrower. The higher the ESG score the lower the interest rate of the loan charged to firms.²⁷

¹⁹ Bank of England (2019). ['First meeting of the PRA and FCA's joint Climate Financial Risk Forum'](#), March 2019.

²⁰ Carbon Brief (2019). ['In-depth Q&A: The UK becomes first major economy to set net-zero climate goal'](#), June 2019; Zenghelis, D. (2019). ['Why the Chancellor's statement on the cost of a net-zero transition in the UK could imperil the country's climate ambitions'](#), Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, June 2019.

²¹ Share Action (2017). ['Banking on a low-carbon future: A ranking of the 15 largest European banks' responses to climate change'](#), February 2017.

²² UNEP (2016). ['The United Kingdom: global hub, local dynamics, mapping the transition to a sustainable financial system'](#), United Nations Environment Programme.

²³ Triodos is based in the Netherlands, but it also has branches in the UK.

²⁴ UNEP (2016). ['The United Kingdom: global hub, local dynamics, mapping the transition to a sustainable financial system'](#), United Nations Environment Programme.

²⁵ Barclays (2018). ['The green finance revolution'](#), August 2018

²⁶ Bloomberg (2019). ['Bonds to save the planet'](#), April 2019.

²⁷ Furió, E. (2018). ['BBVA goes green'](#), BBVA.

Fourth, institutional investors are increasingly turning to sustainable investments, using the ESG criteria for asset selection.²⁸ The Investment Association estimated in its 2019 report that around 26% of the GBP 7.7 trillion assets managed in the UK follow ‘some form of responsible investment criteria’ (p. 32)²⁹. The turn to ESG, as explained below, raises critical questions of reliability that need to be resolved in order to avoid greenwashing.

Fifth, empirical evidence has shown that the yield of green bonds appears to be slightly lower than the yield of conventional bonds, since there is a high demand for them by investors.³⁰ Furthermore, there is some evidence that the cost of borrowing for carbon-intensive companies has increased after the Paris Agreement³¹ and that the stock market has started reflecting climate risks after the Agreement.³² However, we are still far from having financial markets that price climate risks appropriately.

The relatively slow growth in green finance should not be interpreted as an indication of a shortage of green projects to finance. Although the amount of green projects that need financing is not currently extremely large, the existence of such projects is not independent of the financing conditions and the availability of credit. The lower the cost of borrowing and the availability of funds for these projects, the more likely it is that the number of these projects will increase in the future. Such projects might also increase in the future as a consequence of green fiscal and industrial policies.

2.2 Climate-related financial risks

Climate change and the transition to a low a carbon economy will have a profound impact on the economy, and in turn the financial system. The UN’s latest IPCC report warned that a world just half a degree warmer on average than today’s would cost the global economy at least \$54 (£44) trillion in damages by 2040.³³ Although it is clear that un-mitigated climate change will entail profound effects for the macro-economy in the future, these effects are already appearing and crystallising. At the same time, whilst a transition to a low carbon economy will present significant opportunities, it could present considerable risks to the UK economy and financial stability. Actions taken by the private sector to address climate change may have disruptive impacts for the financial system; and, an abrupt or disorderly transition could significantly damage the functioning of the UK financial sector.

Accordingly, climate change and the transition to a low carbon economy present sources of financial risk, at both the micro level (threatening individual financial institutions), and the macro level (threatening the resilience of the financial system as a whole).

²⁸ See Wehrmann, B. (2019) [‘Deutsche Bank subsidiary head says “tsunami” of sustainable investment activity ahead’](#), Clean Energy Wire.

²⁹ See Investment Association (2019). [‘Investment Management in the UK 2018-2019: The Investment Association Annual Survey’](#), September 2019.

³⁰ Harrison, C. (2019). [‘Green bond pricing in the primary market July-December 2018’](#), Climate Bonds Initiative.

³¹ Delis, M. D., de Greiff, K. and Ongena, S.R.G. (2019). [‘Being stranded with fossil fuel reserves? Climate policy risk and the pricing of bank loans’](#), Swiss Finance Institute Research Paper 18-10.

³² Monasterolo, I. and de Angelis, L. (2019). [‘Blind to carbon risk? An analysis of stock market’s reaction to the Paris Agreement’](#), SSRN.

³³ IPCC (2019). [Global Warming of 1.5 °C](#), Special Report.

The Bank of England's Prudential Regulation Authority (PRA)³⁴ note that there are broadly two transmission channels which climate risks manifest into threats to financial stability:

- **Physical risks** refer to the impacts of climate-related extreme weather events (e.g. droughts, floods, and storms) as well as longer-term (gradual) changes in the climate (e.g. sea level increase, changes in rainfall) that could have a considerable impact on the economy.
- **Transition risks** arise from the processes of mitigation and adjustment towards a lower-carbon economy which are likely to have significant effects on carbon intensive sectors. They are the result of efforts to mitigate long-term risks, prompting near term consequences.

Physical risks

Left unmitigated, climate change is expected to exacerbate the frequency and severity of extreme weather events – and thus augment the underlying financial exposures to physical risks (see Figure 2.3). For example, the direct costs (inflation adjusted) of natural catastrophes to the global economy have increased from US \$40 billion on average per year in the 1980s to around US \$200 billion – a five-fold increase over the course of 30 years.³⁵ With the UK particularly susceptible to flooding and rising sea levels, over 6 million properties in the UK are at risk of flooding. Recent winter flooding in England cost the UK roughly £1.3bn (2013-2014 winter floods) and £1.6bn (2015-16 winter floods) in first order damages,³⁶ estimates suggest that a “business as usual” approach could be 70% higher by 2050.³⁷

Natural disasters are causing increasingly large damages, with insured losses rising to USD 225 bn over 2017 and 2018³⁸. The total investment portfolio of UK insurance companies was just over two trillion for 2017, while the total value of written insurance premiums was \$335bn in 2017 - making it the largest insurance industry in Europe and fourth largest in the world³⁹.

Importantly, the second round (indirect) monetary effects of physical events can also be considerable, as supply chains are disrupted (e.g. leading to a shortage of available inputs and volatile import prices), household wealth and private consumption dampened, and business investment diminished due to damaged capital stock and growing uncertainty surrounding future demand.⁴⁰ For example, a recent study of the 2007 summer floods in Yorkshire and

³⁴ Prudential Regulatory Authority, (2019). '[Enhancing banks' and insurers' approaches to managing the financial risks from climate change](#)', Supervisory Statement SS3/19. Bank of England. April 2019.

³⁵ We use inflation adjusted loss data which demonstrates how high a historic loss value would be in today's money (loss value in local currency is adjusted to inflation via the country's consumer price index (CPI) under consideration of exchange rate fluctuations between the local currency and the US\$).

³⁶ Environment Agency (2018). '[Estimating the economic costs of the 2015 to 2016 winter floods](#)', UK Environment Agency, January 2018.

³⁷ White, C., Thong, C., Rowcroft, P., Heaver, M., Lewney, R. and Smith, S. (2017), '[Developing and piloting a UK Natural Capital Stress Test: Final Report](#)', prepared by AECOM and Cambridge Econometrics for WWF-UK.

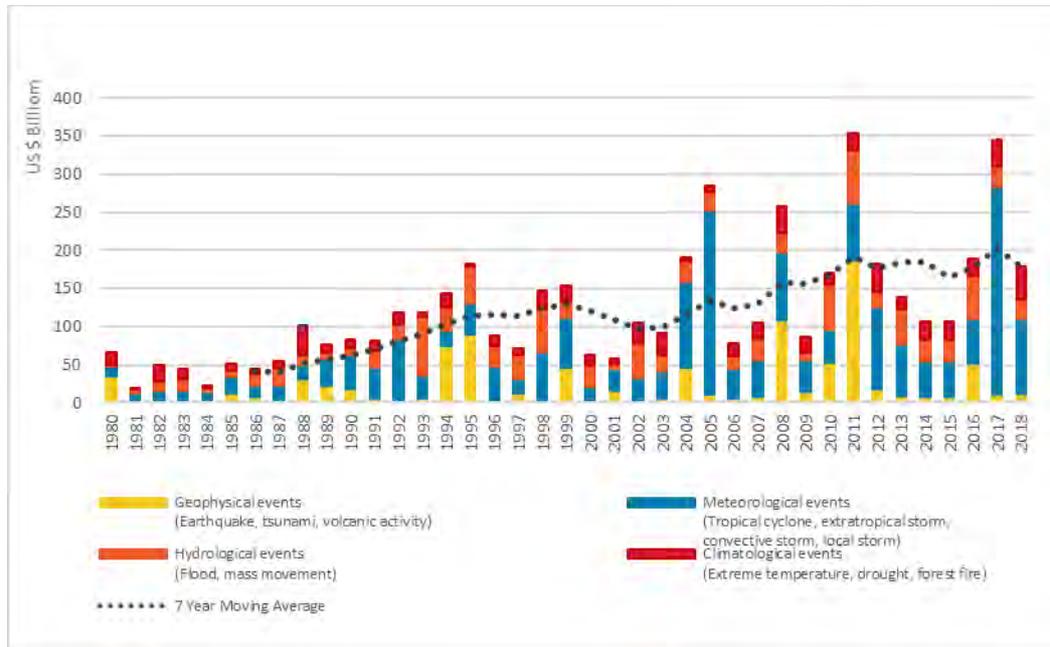
³⁸ Network for Greening the Financial System (2018) [NGFS: First Progress Report](#), October, 2018.

³⁹ Network for Greening the Financial System (2018) [NGFS: First Progress Report](#), October, 2018.

⁴⁰ Network for Greening the Financial System (2018). '[NGFS: First Progress Report](#)', October, 2018.

Humber, suggest that the knock-on effects doubled the total economic burden of the flooding in the region.⁴¹

Figure 2.3 Weather-related losses worldwide, 1980–2018



Source: Geo Risks Research, Munich Reinsurance Company and NatCatSERVICE 2019.

Physical damages can translate into credit risks (the capacity to service debts) by impacting households’ or firms’ cash-flows through reduced income and profits (e.g. a fall in production capacity, reduced demand, higher capital and operating costs). Physical risks can also reduce the value of financial assets or collateral held by bank, either through direct damages of a weather related event or via reductions in assets valuations in places deemed high-risk.⁴² A fall in asset prices triggered by physical risks would impact the capital and collateral that back banks credit operations, increasing their credit risk and that of other financial intuitions.⁴³

Modelling techniques aimed at estimating the physical risks of climate change to financial stability are still in their infancy, and generally done at a global level. A recent estimate suggests that in a business as usual scenario the climate value at risk of global financial assets (in 2015) was 1.8% (US\$ 2.5 trillion) but with the tail risk at the 99th percentile of 16.9% (US\$24.2 trillion).⁴⁴ Other analyses have indicated that the physical effects of climate change on output,

⁴¹ Mendoza-Tinoco, D., Guan, D., Zeng, Z., Xia, Y., and Serrano, A. (2017). [‘Flood footprint of the 2007 floods in the UK: The case of the Yorkshire and The Humber Region’](#), Journal of Cleaner Production, 168, 655-667.

⁴² Monnin, P. (2018). [‘Integrating climate risks into credit risk assessment-current methodologies and the case of Central Banks Corporate Bond Purchases’](#), Council on Economic Policies, Discussion Note 4.

⁴³ Prudential Regulatory Authority (2019). [‘Enhancing banks’ and insurers’ approaches to managing the financial risks from climate change’](#), Supervisory Statement SS3/19. Bank of England, April, 2019.

⁴⁴ Dietz, S., Bowen, A., Dixon, C. and Gradwell, P. (2016). [‘Climate value ta risk’ of global financial assets’](#), Nature Climate Change, 6, 676-679.

capital and labour productivity could have severe implications for private sector debt and debt defaults, potentially leading to 'global financial breakdown'.⁴⁵

Transition risks

Achieving the goals of the Paris Climate Agreement requires a fundamental structural transformation of our economy. The process of mitigating climate change and adjusting to a low carbon economy brings considerable risks. These transition risks are considered to emerge from three primary pathways: *policy changes* (e.g. carbon taxes, emission limits, decarbonisation requirements), *technological advances* (e.g. innovation or improvements – i.e. renewable energy sources – that make low carbon technologies more competitive than carbon intensive alternatives), and *changes to consumer preferences* (e.g. resistance by local communities to fracking or the ongoing to switch to plant based diets). Should such risks materialise, Governor of the Bank of England Mark Carney warned, it could 'destabilise markets, spark a pro-cyclical crystallisation of losses and lead to a persistent tightening of financial conditions: a climate Minsky moment'.⁴⁶

Transition risks bring into focus what is known as 'stranded assets'. Estimates indicate that we should not use more than a quarter of current global fossil fuel reserves if we are to successfully meet the Paris Climate Agreement and stop temperatures rising above 2°C. The implication is that the vast majority of coal, oil, and gas reserves will have to remain un-extracted, that fossil fuel companies could be grossly overpriced, and the infrastructure built to obtain and process these reserves may become worthless (or stranded).⁴⁷ According to Carbon Tracker (2018), the fossil fuel sector has the largest built asset infrastructure in the world, with a value of US \$25 trillion.⁴⁸

However, stranded assets would not only have a direct detrimental impact on fossil fuel companies and carbon intensive sectors, but also the other industries that are dependent on carbon intensive inputs in their production. Similarly, it is not only assets that are at risk of stranding. Workers, entire communities and places that are economically dependent on carbon intensive industries that could be left stranded by the transition.⁴⁹

Roughly a quarter of global equity and debt markets are in the fossil fuel and related sectors, with approximately 25% of the market value of the FTSE 100 stock exchange is derived from oil, gas and mining companies.⁵⁰ The financial sector based in London remains one of the

⁴⁵ Bovari, E., Giraud, G., and Mc Isaac, F. (2018). '[Coping with collapse: a stock-flow consistent monetary macrodynamics of global warming](#)', Ecological economics, 147, 383-398; Dafermos, Y., Nikolaidi, M. and Galanis, G. (2018). '[Climate change, financial stability and monetary policy](#)', Ecological Economics, 152, 219-234.

⁴⁶ Carney, M. (2015). '[Breaking the tragedy of the horizon – climate change and financial stability](#)', speech at the Lloyd's of London on September 29, 2015.

⁴⁷ See Van Lerven, F. and Ryan-Collins, J. (2017) '[Central banks, climate change and the transition to a low-carbon economy](#)', New Economics Foundation.

⁴⁸ Carbon Tracker (2018). '[2020 Vision: why you should see the fossil fuel peak coming](#)', Carbon Tracker, September 2018.

⁴⁹ Robins, N., Brunsting, V., and Wood, D. (2018). '[Investing in a just transition: Why investors need to integrate a social dimension into their climate strategies and how they could take action](#)', London: Grantham Research Institute on Climate Change and the Environment.

⁵⁰ Macquarie, R. (2018) '[A green Bank of England Central Banking for a Low-Carbon Economy](#)', Positive Money, May 2018.

largest global centres for financing fossil fuel, and is estimated to support at a minimum 15% of total global emissions.

At a global level, Mercure et al., (2018) estimate that the discounted global wealth losses from stranded fossil-fuel assets would result in between US \$1-4 trillion.⁵¹ When looking at the economy more broadly, the Network for Greening the Financial (NGFS) suggests these transition losses could reach up to US \$20 trillion.⁵²

By extending credit to entities subjected to transition risks (such as the fossil fuel industries, companies highly dependent on carbon intensive inputs for production, and the employees of said companies), the banking sector is also exposed to transition risks. Whilst direct exposures to fossil fuel and carbon intensive sectors may not be a primary concern, the indirect exposures may pose a significant threat to a bank's solvency and the wider stability of the financial system. Climate stress tests by De Nederlandsche Bank (DNB) suggest direct exposures do not pose an immediate threat to financial stability, but indirect exposures to carbon intensive sectors are noteworthy and potentially systemic in nature.⁵³ A similar analysis estimating the exposures of financial institutions in the Euro area, suggests that 'direct exposures to the fossil fuel sector are small (3-12%), the combined exposures to climate-policy relevant sectors are large (40-54%).'⁵⁴

Whilst the Bank of England has committed to conducting climate stress-tests of the UK financial system, a preliminary survey (2018) of 90% of UK banks representing over £11 trillion of assets has been conducted by the Prudential Regulatory Authority. Results indicate that while 70% of banks consider climate change a source of financial risk (emerging from both 'physical' and 'transition' factors), only 10% manage these risks comprehensively and take a long-term strategic view of the risks.⁵⁵

2.3 Climate-related financial disclosures

Over the last years, various initiatives have been taken that intend to develop methodologies that permit consistent climate-related financial disclosures. There are two different approaches to that issue: the environmental impact-based and risk-based approaches.

The *environmental impact-based approaches* rely on the idea of identifying those financial products that are linked with environmentally sustainable activities or to assess firms based on the environmental effects of their activities. The most common of these is the Environmental, Social and Governance (ESG) approach, where investors incorporate ESG issues in their

⁵¹ Mercure, J.-F., Pollitt, H., Viñuales, J. E., Edwards, N. R., Holden, P. B., Chewprecha, U., Salas, P., Sognaes, I., Lam, A. and Knobloch, F. (2018). '[Macroeconomic impact of stranded fossil fuel assets](#)', Nature Climate Change, 8, 588-593.

⁵² Network for Greening the Financial System (2019). '[NGFS: First Comprehensive Report: A Call for Action, climate change as a source of financial risk](#)'. October, 2018.

⁵³ Regelink, M., van Reinders, H., van der Viel, I. and Vleeschhouwer, M. (2017). '[Waterproof: An Exploration of Climate Related Financial Risks](#)', De Nederlandsche Bank.

⁵⁴ Battiston, S., Mandel, A., Monasterolo, I., Schütze, F. and Visentin, G. (2017). '[A climate stress-test of the financial system](#)', Nature Climate Change, 7 (4), 283-288.

⁵⁵ Prudential Regulatory Authority, (2018). '[Transition in thinking: The impact of climate change on the UK banking sector](#)'. Bank of England.

investment strategies through a variety of methods. In 2019, the EU Commission's Sustainable Finance initiative proposed a new, public EU taxonomy, a list of economic activities with performance criteria for their contribution to six environmental objectives.

The *risk-based approaches* focus on the identification of the climate risks (physical and transition ones) related with financial products (bonds, stocks, loans etc.) and companies. The way that climate-related financial information is collected has wider implications that move beyond the disclosure to investors. The most crucial implication is that this information can be used for the design and implementation of climate finance policies that have as a prerequisite the identification of the environmental impact or the climate risk of different financial assets and organisations.

Environmental impact-based approaches

ESG approaches: Private financial institutions, from banks to asset managers and institutional investors, increasingly use Environmental Social and Governance (ESG) approaches. ESG investing originated in equity markets, and evolved into a set of methods that are often used in conjunction with each other, according to the investment mandates of different investors. The methods range from negative/exclusionary screening (excluding companies with specific activities or entire industries, such as fossil fuels), positive screening/best in class (overweighting companies whose ESG performance is better relative to sector peers), thematic investment (such as climate investing in renewables or energy efficiency), active engagement (rather than divesting, combining ownership rights and 'voice' to promote companies' transition to low-carbon), and ESG integration (the systematic inclusion of ESG risks and opportunities in investment analysis, portfolio construction and risk management⁵⁶).

However, not all these methods are suitable for fixed income instruments – bonds issues by corporations, financial institutions and governments. The incorporation of ESG issues in fixed income instruments is particularly challenging compared to equities, because it requires specifying the relationship with credit ratings, to liquidity and other market risks⁵⁷. Moreover, investors typically pay more attention to questions of governance and to social issues rather than environment in applying ESG considerations to fixed income instruments⁵⁸.

Despite such difficulties, investors are increasingly embracing ESG. It is expected that two-thirds of assets managed by global funds will be ESG assets by 2021⁵⁹. Central banks are encouraging this shift, by adopting ESG criteria in the management of their own asset portfolios⁶⁰.

⁵⁶ See Inderst, G. and Stewart, F. (2018). ['Incorporating Environmental, Social and Governance\(ESG\) factors into Fixed Income Investment'](#), World Bank Group.

⁵⁷ Inderst and Stewart (2018) note that for fixed income instruments, 'there is still little analysis of the relationship of ESG factors on market risks, inflation, liquidity, maturity, term structures and yield curves, income stability, total returns, and other risks/opportunities such as default risk or recovery rate' (p. 21).

⁵⁸ Environmental concerns typically rank last in the ESG investment for fixed-income instruments.

'Environmental decisions, on the other hand, are often felt well beyond the time horizons of liquidity portfolios, so these may demand less ongoing attention'. See Campbell B. (2019). ['ESG investing is here to stay-even in the fixed income world'](#), Capital Advisors Group.

⁵⁹ Nelson, E. (2018). ['When will 'socially responsible investing' become just 'investing'?'](#), 9 July 2018.

⁶⁰ See Coeuré, B. (2018). ['Monetary policy and climate change'](#), 8 November 2018.

According to the World Bank, of the methods identified above, the ESG integration approach offers significant scope to be adopted for both equities and fixed income instruments⁶¹. The convergence towards ESG integration methods brings to the fore the importance of ESG data and ratings. These are typically provided by private companies and in some cases, further refined by the in-house ESG desks of institutional investors. An ESG score/rating aggregates various key environmental, social and governance aspects associated with a company or country⁶². For instance, the MSCI ESG ratings aggregates data for 10 themes, across 37 key issues. The methods for aggregation and the data considered relevant vary significantly across providers, reflecting in part the lack of consensus and the subjective nature of constructing ESG ratings⁶³.

The European Union Taxonomy: has been recently introduced by the European Commission as a part of its broader project on Sustainable Finance.⁶⁴ The EU Taxonomy, developed by a Technical Expert Group on Sustainable Finance (TEG)⁶⁵ in cooperation with climate experts, aims to help investors understand the environmental impact of their investments and induce them to redirect capital towards more environmentally friendly financial products. The EU Taxonomy is a list of economic activities with performance criteria for their contribution to six environmental objectives, which are not confined to climate change issues alone. These are: (i) climate change mitigation; (ii) climate change adaptation; (iii) sustainable use and protection of sustainable water and marine sources; (iv) transition to a circular economy, waste prevention and recycling; (v) pollution prevention and control; (vi) protection of healthy ecosystems.

Two requirements need to be met in order for an economic activity to be considered taxonomy-eligible: *first*, it must contribute substantially to at least one of the six environmental objectives and, *second*, it should do no significant harm to the other five, as well as meet minimum social safeguards. The European Commission suggests that investors can disclose the proportion of their investment funding that is Taxonomy-eligible. However, they clarify that the Taxonomy is not mandatory for investment decisions and investors are free to use their own approach to disclosure.

The European Commission provides some guidelines about the way in which the taxonomy can be used in practice, if investors wish to evaluate the environmental performance of a company. In particular, they suggest that investors need first to identify the activities of a company that can be eligible and then assess whether each one of these activities meets the criteria identified by the Commission, taking also into account minimum social safeguards. Once the Taxonomy-eligible activities have been identified, the investors can estimate the proportion of companies' activities which are Taxonomy-eligible. In turn, these estimations can be used to identify the degree to which a specific financial instrument is Taxonomy-eligible. For instance,

⁶¹ See Inderst and Stewart (2018).

⁶² Typically, ESG data measure a company's performance across E (including carbon emissions, pollution and waste, use of natural resources etc.), S (labor standards, human rights, workplace health, safety and inclusion community relations) and G (corporate governance, tax related issues, corruption etc).

⁶³ See Mark Carney (2019). '[TCFD: strengthening the foundations of sustainable finance](#)', October 2019.

⁶⁴ See European Commission. '[Green finance](#)' and European Commission (2019). '[Financing a sustainable European economy: Taxonomy technical report](#)', EU Technical Expert Group on Sustainable Finance, June 2019.

⁶⁵ European Commission. '[Technical expert group on sustainable finance \(TEG\)](#)'.

the degree of eligibility of an equity portfolio can be estimated by calculating the weighted average of the Taxonomy-eligible activities that correspond to the companies that have issued the stocks which are included in this portfolio.

The European Commission has so far worked in greater detail on two out of the six environmentally friendly activities mentioned above. These are climate change mitigation and adaptation. The climate change mitigation activities are of particular importance for decarbonisation. The Commission has specified three types of such activities (see Table 2.1): (i) activities that are already low-carbon (such as zero emissions transport), (ii) activities that contribute to the transition to zero net emissions economy (such as cars that generate emissions lower than specific thresholds) and (iii) activities that enable activities (i) and (ii) (e.g. manufacture of wind turbines).

Table 2.1: Taxonomy-eligible mitigation activities

| Type of activity | Technical screening criteria | Examples |
|--|---|---|
| 1) Activities that are already low carbon. Already compatible with a 2050 net zero carbon economy | Likely to be stable and long-term | <ul style="list-style-type: none"> • Zero emissions transport • Near to zero carbon electricity generation • Afforestation |
| 2) Activities that contribute to a transition to a zero net emissions economy in 2050 but are not currently operating at that level. | Likely to be subject to regular revision, tending towards zero emissions. | <ul style="list-style-type: none"> • Building renovation; • Electricity generation <100g CO2/kWh • Cars <50g CO2/km |
| 3) Activities that enable those above. | Likely to be stable and long-term (if enabling activities that are already low carbon) or subject to regular revision tending to zero (if enabling activities that contribute to transition but are not yet operating at this level). | <ul style="list-style-type: none"> • Manufacture of wind turbines • Installing efficient boilers in buildings |

Source: European Commission (2019)

Risk-based approaches

The Task Force on Climate-related Financial Disclosures (TCFD), which was established in 2015, has played a leading role in promoting risk-based approaches to the disclosure of climate-related financial information.⁶⁶ The broader purpose of the TCFD is to help financial markets measure and respond to climate risks by developing methodologies that permit the consistent reporting of information about climate-related risk. This purpose is shared by the Network for Greening the Financial System (NGFS), which pays particular attention to the analysis of the risks that climate change poses to financial stability.⁶⁷

⁶⁶ TCFD (2017). [‘Final report: Recommendations of the Task Force on Climate-related Financial Disclosures’](#), Task Force on Climate-related Financial Disclosures, June 2017.

⁶⁷ NGFS (2019). [‘Network for Greening the Financial System First comprehensive report: A call for action climate change as a source of financial risk’](#), April 2019.

The TCFD adopts the distinction between physical and transition risks. It also identifies that the financial impact of climate change could be linked both with the income statement (revenues and expenditures) and the balance sheet (assets and liabilities and capital financing) of companies.⁶⁸ In its recommendations the TCFD suggests that organisations disclose (i) their governance of climate risk (which includes, for example, the approach that is adopted to climate risks by the board and the management), (ii) the actual and potential impact of climate-related risks on the organisation's businesses, strategy, and financial planning, (iii) how the organisation identifies, assesses and manages climate-related risks and (iv) the metrics and targets used to assess and tackle climate-related risks.

Regarding (iv), the TCFD makes some suggestions for specific metrics that can be used to capture climate risks, such as the level of scope 1, 2 and 3 greenhouse gas emissions and the proportion of assets located in coastal or flood zones. It is also supportive of scenario analysis and has provided some general guidelines about the way that climate-related scenarios could be developed by organisations. Although these are helpful for a first approximation of climate risks, the TCFD considerations are still very far from sufficient as a proper analysis of these risks. An integrated understanding of climate-related risks requires the consideration of network and macro-related effects. The TCFD has not yet made precise recommendations on how these effects can be incorporated in the analysis of climate risks.

2.4 The UK government Green Finance Strategy: market-led, too much carrot, too little stick

The Conservative government published the official Green Finance Strategy in July 2019.⁶⁹ It is aligned to the Government's target of net zero Greenhouse Gas emissions by 2050 and promises to use the institutional force of the UK government to promote Sustainable Finance. Yet its deregulated decarbonisation approach means that the measures in place are not ambitious enough.

Conflicting objectives: The Strategy has two objectives, to align private finance with 'clean, environmentally sustainable and resilient growth' and strengthen the competitiveness of the UK financial sector as a green finance centre. However, robust measures and frameworks for greening the financial system – from a public taxonomy to greening the Bank of England and macroprudential measures - may be pared back to prioritise the development of green asset classes that meet the profitability requirements of investors.

Voluntary disclosure of TCFD: The Strategy endorses voluntary disclosure of TCFD risks for large companies and asset managers by 2022, and pushes the question of mandatory disclosure to a joint taskforce with regulators.

Private ESG-led: The Strategy endorses the private ESG approach to incorporating climate and environmental factors into the portfolio decisions of financial institutions. While it promises to be as ambitious as the objectives of the EU Sustainable Finance initiative (reorient capital flows

⁶⁸ TCFD (2017). ['Implementing the recommendations of the Task Force on Climate-related Financial Disclosures'](#), Task Force on Climate-related Financial Disclosures, June 2017.

⁶⁹ HM Government (2019). ['Green finance strategy: Transforming finance for a greener future'](#), July 2019.

towards sustainable investment; manage financial risks from climate change by considering environmental and social goals in decision making and increased transparency in financial products), it does not embrace the EU Taxonomy. Rather, it put the British Standards Institution in charge of designing a program of internationally relevant standards on Sustainable Finance.

Lack of penalties for brown projects/activities: Although the Government's Green Finance Strategy (the "Strategy") recognises that investment in fossil fuel projects is inconsistent with the Paris Agreement targets, no specific measures are suggested for disincentivising brown-related finance. This makes it extremely difficult to achieve the targets that the Strategy has set, as for instance the phasing out of fossil fuel heating.

Insufficient government financing: Although the Strategy recognises the complementary role that the government should play in the financing of green projects, the amount of government finance that has been planned to be used is low. On top of that, it is assumed that the private sector will have an unrealistically large contribution to green projects. For example, government will invest only £320 million in the Heat Network Investment Project and it expects that the private sector will contribute an additional £1 billion.

No green sovereign bonds: The Strategy makes it clear that the UK government is not going to issue green sovereign bonds, ruling out the possibility of using public green finance instruments for supporting the greening of the UK financial system.

Support of green financial innovation without clear environmental criteria: The Strategy endorses green financial innovation, such as green home finance products and green FinTech products (see e.g. the £5 million Green Home Finance Innovation Fund has as an aim to fund green home finance products). However, the lack of a public taxonomy that would specify which mortgages should be considered 'green', leaves room for substantial 'greenwashing' in favour of financial innovation-led profitability, and at the expense of decarbonisation targets.

To sum up, a market-led approach will not put the UK economy on an ambitious decarbonization path.

There are several market failures that render a deregulated decarbonization approach much too slow⁷⁰: a mismatch between the time horizon of market participants and that in which the catastrophic impact of climate change will be experienced (the tragedy of the horizons), regulation and accounting standards that amplify short-termism, new low-carbon/green asset classes without market liquidity, and increasing corporate market power⁷¹.

⁷⁰ Krogstrup, S. and Oman, W. (2019). [‘Macroeconomic and financial policies for climate change mitigation: A review of the literature’](#), IMF Working Paper No 19/185.

⁷¹ IMF (2019). [‘World Economic Outlook, Growth slowdown, precarious recovery’](#), April 2019.

3. SETTING THE STAGE FOR THE GREENING OF THE UK FINANCIAL SYSTEM: TAXONOMY AND FINANCIAL DISCLOSURES

A prerequisite for the development of a climate-aligned UK financial system is the establishment of a new institutional architecture that would set the stage for the implementation of green monetary and financial policies. Our recommendations below specify how this architecture could be built.

Recommendation 1: Develop a green/brown public taxonomy

A crucial first step for the greening of the financial system is the identification of the greenness and brownness of the companies' activities and, consequently, of the financial instruments/products linked with these activities. This can be achieved either through environmental impact-based approaches or risk-based approaches (see Section 1).

Risk-based approaches, like the ones used by TCFD, face various challenges in practice. Identifying the climate-related financial risks linked with a specific financial instrument/product is more challenging than just specifying the environmental impact of the activities that are behind these instruments/products. More precisely, in the case of physical risks, our knowledge of the damages that will be caused by climate change is still limited and the data that can be used in order to capture such risks are not still very credible. In the case of transition risks, although the degree of brownness can be used as a first proxy of climate risks, a financial product that is linked with the generation of a large amount of carbon emissions is not necessarily subject to transition risks. For example, companies might decide to change their business model until the transition takes place; or some companies might be able to pass the cost of the transition (e.g. of higher carbon prices) on to their customers avoiding, at least to some extent, the deterioration in their financial performance, as a result of an abrupt implementation of climate policies. In addition, as alluded to above, a proper analysis of climate risks requires the evaluation of network and macro-related dynamic effects. Although the academic literature has made some progress in assessing these risks,⁷² there is still a lack of broadly accepted approaches that can capture these effects accurately and at a sufficiently granular level.

While the environmental impact-based approaches face significant challenges as well, identifying the environmental impact of activities is arguably a more manageable task than analysing climate risks. This is because risk-based approaches add a layer of complexity to the impact-based approaches, requiring additional information on complex macrofinancial effects. An additional advantage of the environmental impact-based approaches is that they provide a more straightforward framework that can be directly deployed for financial and monetary policy interventions conducive to decarbonisation.

How should the greenness and brownness of financial instruments/products be identified? The development of a public taxonomy, building on the work of the European Commission, is preferable to the use of ESG ratings.

⁷² See e.g. Battiston, S., Mandel, A., Monasterolo, I., Schütze, F. and Visentin, G. (2017). [‘A climate stress-test of the financial system’](#), *Nature Climate Change*, 7 (4), 283-288; Dafermos, Y., Nikolaidi, M. and Galanis, G. (2018). [‘Climate change, financial stability and monetary policy’](#), *Ecological Economics*, 152, 219-234.

An ambitious low-carbon agenda requires adequate metrics for analysing the environmental impact of financial assets and institutions. These metrics cannot be based on ESG approaches. ESG approaches suffer from significant shortcomings that would at worst thwart and at best complicate policy initiatives to reorient finance towards financing the low-carbon transition.

Private providers quantify the ESG performance of a company or country, by identifying a set of criteria whose relevance or quantification is not universally shared or established. Environmental questions often rank last, particularly for fixed-income investors. Hence, ratings are often confusing⁷³ and conflicting⁷⁴. This makes it easy (a) for issuers of ESG assets to engage in greenwashing, as is often the case⁷⁵, misleading investors about the greenness of the assets they purchase; and (b) for investors to arbitrage ESG-based regulatory frameworks by shopping for high ESG scores. Huge variation in ESG measurements also complicates the efforts of institutional investors who have a real interest in greening their portfolios.

These issues should be not be neglected, given that ESG providers face the same set of mis-incentives that credit rating agencies faced before the global financial crisis. Then, credit ratings agencies responded to ratings shopping by awarding high ratings to asset-backed securities without due diligence into the credit quality of the underlying loans⁷⁶. A proper greening of the financial system could be severely undermined if similar types of mis-incentives were allowed to be developed.

By establishing common methodologies, the development of a UK green/brown public taxonomy could provide a more solid basis for identifying the environmental impact of financial products/instruments. Such a taxonomy would circumvent the misincentives hardwired into private ESG approaches, and offer certainty to investors concerned with the urgency of climate change.

However, it is crucial that the UK Taxonomy addresses the limitations of the EU Taxonomy. These are the following. First, the European Commission does not identify environmentally harmful activities. This implies that those companies that undertake such activities can continue doing so without experiencing a direct adverse impact on their financial profile. Second, in the case of climate mitigation activities, it looks problematic to treat as Taxonomy-eligible activities that produce a significant amount of emissions (even if they are considered to contribute indirectly to the transition to a low-carbon economy). It would be more consistent to classify these activities as non-green with a low degree of brownness. Third, the European Commission has adopted a binary approach: an activity can be Taxonomy-eligible or not. This means that activities with very different quantitative contributions to the reduction

⁷³ Moret, J. (2017). [‘An integrated approach to managing ESG risks and opportunities’](#), Franklin Templeton, 1 April 2017.

⁷⁴ Financial Times (2018). [‘Lies, damned lies and ESG rating methodologies’](#), 6 December 2018.

⁷⁵ For example, the world’s largest asset manager, and an important issuer of ESG ETFs, Blackrock recently used its shareholder power to block measures against high-carbon companies that would accelerate the transition to a low carbon economy. See Kasargod-Staub, E., (2019). [‘BlackRock and Vanguard protect fossil fuel, energy, and auto execs from facing accountability on climate change’](#), Majority Action, 30 August 2019.

⁷⁶ Segovian, M., Jones, B., Lindner, P. and Blankenheim, J. (2013). [‘Securitization: Lessons learned and the road ahead’](#), IMF Working Paper 13/255.

of greenhouse gas emissions are considered to be identical in the taxonomy. It would be more productive to identify activities with different degrees of greenness and brownness.

How could the government promote the development of a green/brown taxonomy that does not suffer from these limitations? Although It is beyond the scope of this report to provide a detailed account of the features of this taxonomy, we identify a series of broad principles to guide the taxonomy.

First, green activities should be defined in way that minimises the risk of greenwashing. In order for this to be more likely, we suggest that green activities include only those mitigation activities that are already low-carbon or enable low-carbon investments.⁷⁷ In other words, our proposal is to exclude the activities that contribute to the transition to a zero net emissions economy in 2050, or whatever target replaces that under Labour, but do not operate currently at this level (see Table 2.1). This would set a stricter threshold on what is green and what is not, compared to what is the case in the EU Taxonomy.

Second, for those activities that are classified as green, degrees of greenness should be defined. Although this is undoubtedly a complex task, a simple example about the way that this could be done is to rely on the level of emissions that are avoided through the corresponding activity. The higher the amount of avoided emissions, the higher the degree of greenness. Degrees of greenness allow policy makers to support more actively those activities that can have a higher contribution to the transition to a net zero emissions economy.

Third, the non-green activities should be assigned a degree of brownness. Again, a simple way to illustrate how this could be done is by relying on the activities' level of emissions. With everything else given, the higher the level of emissions, the higher the degree of brownness. Policy makers could use the degree of brownness in order to penalise more those activities that have a more negative environmental impact.

Since there are many details of this taxonomy that should be investigated in detail, it is important for the UK taxonomy to be developed through the collaboration of a wide range of experts on various disciplines. For this purpose, we suggest the set-up of the UK Technical Expert Group (TEG) on Green Finance, adopting the institutional set-up of the European Commission's own TEG. The UK TEG will be responsible for developing the Taxonomy by bringing together experts from the Government, the Bank of England, the academia, the industry and various think tanks. The UK TEG should also be responsible for the continuous update of the taxonomy.

The development of the taxonomy should not be viewed as a substitute for the development of methodologies and the collection of data that would allow the Bank of England and market participants to disclose climate-related financial risks and conduct climate stress tests. The analysis of climate risks should continue in parallel with the development of the taxonomy.

⁷⁷ This report does not analyse explicitly adaptation activities. However, it is clear that such activities should be explicitly considered in the UK Taxonomy, as it has been the case in the EU one.

Recommendation II: Make climate-related financial disclosures mandatory

The disclosure of climate-related information should be mandatory for all institutions that engage in financial activities. There are two types of information that should be disclosed. First, the degree of greenness and brownness of the financial assets held by financial and non-financial corporations. This should be disclosed based on the Taxonomy. Second, it is important that disclosure extends to the transition and physical climate risks facing the institutions. These risks could be disclosed based on methodologies that are now being developed by TCFD and NGFS. For example, the TCFD's work on disclosures, governance, strategy and risk management is a useful starting place to achieve effective disclosures for publicly listed firms (equity and debt) and for financial institutions, including insurers, asset managers and funds as asset owners.⁷⁸ These recommendations could be incorporated into Pillar 2 reporting (and the Internal Capital Adequacy Assessment Process) and Pillar 3 disclosure requirements (public disclosures)⁷⁹. Consultations to formulate policy statements for final regulatory drafts should be high on the agenda of a Labour government.

However, taxonomy-related financial disclosures should be the first priority for the government since this information could allow investors and the public to make informed decisions about their investment and consumption choices that would directly help the decarbonisation of the UK economy. Climate risk-related disclosures might be implemented more gradually, depending on how quickly robust methodologies for the analysis of these risks will be developed. The process of making climate-related mandatory could be accelerated by the conduct of climate stress tests by the Bank of England. These stress tests should become a high priority for the Bank of England.

Despite the importance of mandatory climate-related financial disclosures, it should be emphasised that these are merely a first step in a suite of reforms needed to adequately green the financial system. Indeed, by themselves disclosure requirements would not bring about a 'game changing' shift that is sometimes claimed.⁸⁰

An over-reliance on this approach (and implicitly the efficiency of markets) inherently assumes that focusing on the safety and soundness of individual institutions at the micro level will ensure financial resilience to the system as a whole.⁸¹ It thus ignores a fundamental lesson of the 2008 global financial crisis, that individual (shadow) banks are not equipped to consider

⁷⁸ See TCFD (2017). ['Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures'](#), Task Force on Climate-related Disclosures, Financial Stability Board, June 2017 and the TCFD (2019). ['2019 Status Report, Task force on Climate-related Financial Disclosures Status Report'](#), Task Force on Climate-related Disclosures, Financial Stability Board, June 2019.

⁷⁹ Pillar 3 requires firms to publicly disclose information including information related to risks, capital adequacy and risk management processes.

⁸⁰ Christophers, B. (2017). ['Climate change and financial instability: Risk disclosure and the problematics of neoliberal governance'](#), *Annals of the American Association of Geographers*, 107 (5), 1108-1127, or Van Lerven, F. (2018). ['Reshaping finance for a 1.5c world: What the Bank of England needs to do for a Green Transition'](#), New Economics Foundation, November 2018.

⁸¹ Van Lerven, F. and Ryan-Collins, J. (2017). ['Central banks, climate change and the transition to a low-carbon economy'](#), New Economics Foundation, October 2017.

the macro-financial consequences of collective (shadow) bank actions.⁸² Left to their own devices, financial markets are far from efficient allocators of resources; and instead, systemic financial risks can be amplified or created endogenously from within the financial system itself.⁸³ The 2008 global financial crisis thus made it clear that there were certain system-wide macro-financial risks, which individual banks had no incentive to address. Pre-emptive intervention aimed at reigning in activities that lead to systemic risks was necessary, in the form of macroprudential policy.

Recommendation III: Set up the Green Finance Taskforce (GFAT)

Working towards a path of net-zero emissions by 2030 is a very challenging task. It does not only require a rapid increase in green investments and reduction in brown ones. It also implies that some of the real and financial assets in the UK economy will become stranded. At the same time, the financial system will be significantly affected by the industrial, fiscal and other policies that will be introduced as part of the decarbonisation process. Therefore, it is essential to ensure that there will be a coordination of green finance policies with other climate policies such that the reduction of emissions will be maximised and the economic disruptions caused by decarbonisation will be minimal.

We recommend that the Green Finance Task Force (GFAT) be set up.⁸⁴ The mandate of the GFAT will be to monitor closely progress in greening private finance, take actions to tackle transition risks and respond dynamically to barriers and obstacles that stand in the way of reorienting private finance towards green activities. More precisely, GFAT will:

- Monitor the transition effects of green finance policies and design appropriate measures to mitigate transition risks, where these threaten to materialise.
- Dynamically calibrate the set of measures tackling brown assets, in order to minimise the potential for greenwashing and regulatory arbitrage. This would include periodic revisions of the set of 'super-brown' assets that finance activities with substantive greenhouse gas emissions.
- Dynamically calibrate the set of measures encouraging the emergence and rapid growth of green assets, in order to minimise the potential for greenwashing and to address potential imbalances between the demand for and supply of green assets.
- Analyse how climate policies are likely to affect the financial system and make suggestions for the coordination of green fiscal, industrial and finance policies.
- Monitor the liquidity of green assets and introduce temporary liquidity-enhancing measures in order to preserve the preferential regulatory treatment envisaged in this report.

⁸² See for example, Haldane, A. (2013), '[Macroprudential policies—when and how to use them](#)', Paper presented at Re-thinking macro policy: First steps and early lessons Conference, IMF Washington.

⁸³ Bezemer, D., Ryan-Collins, J., van Lerven., F., and Zhang. L. (2018). '[Credit where its due: A historical, theoretical and empirical review of credit guidance policies in the 20th century](#)', Institute for Innovation and Public Purpose Working Paper 2018-11, December 2018.

⁸⁴ Note that, for instance, France has set up a High Climate Council with a mandate to evaluate the coherence of policies and strategies to 2050.

- Advise and adjust regulations regarding fiduciary duties to ensure that climate regulation does not lead to fiduciary breaches.⁸⁵

The Green Finance Taskforce should include the Bank of England, the UK Treasury, regulatory bodies mandated to oversee the functioning of non-bank financial institutions, including the Financial Conduct Authority and the Pensions Regulator, and a representative of the UK Technical Expert Group (TEG) on Green Finance. It should coordinate closely with the Committee on Climate Change⁸⁶, and should engage in regular consultations with civil society organisations and private sector bodies for constructive feedback.

4. GREENING MONETARY POLICY AND BANKING REGULATION

The existing mandates of the Bank of England focus on price stability and financial stability. Climate change can affect both types of stability. This is one of the reasons why the Bank of England has recently shown a growing interest in understanding the economic and financial implications of climate change.

As far as price stability is concerned, extreme weather could affect global food production, causing an increase in food price and inflation.⁸⁷ Moreover, an increase in carbon prices could be passed on the price of energy, posing risks to price stability. Since climate change will also have an impact on GDP, central banks need to consider the GDP effects of climate change in their inflation forecasting.

With regard to financial stability, as analysed in Section 1, both the transition to a low-carbon economy and the physical effects of climate change could destabilise the financial system through a large number of channels. The horizon of the transition risks is shorter than the horizon of physical risks.

The Bank of England has recognised that these issues should be explored in detail and has played a leading role in bringing attention to the financial risks of climate change (see Section 2). However, there is significant room for more active approaches to climate change.

Recommendation IV: Green the mandate of the Bank of England by re-interpreting and/or modifying it

The Bank could pro-actively adjust its operations and regulatory framework to capture transition risks, since they threaten financial stability both in the short run and the medium run. Alternatively, or on top of it, the Bank of England could try to contribute to the reduction of longer-term physical risks by reducing carbon emissions through its monetary and prudential policies. In this light, the implementation of a climate-aligned monetary policy and

⁸⁵ While there is ongoing debate about the compatibility between fiduciary duties and green investment, there is a growing consensus that ‘failing to consider all long-term investment value drivers, including ESG issues, is a failure of fiduciary duty’; see PRI, Global Compact, UNEP FI and UNEP Inquiry (2015). [Fiduciary Duty in the 21st century](#), p. 9.

⁸⁶ See <https://www.theccc.org.uk>.

⁸⁷ Coeuré, B. (2018). ‘[Monetary policy and climate change](#)’, 8 November 2018; Olovsson, C. (2018). ‘[Is climate change relevant for central banks?](#)’, Sveriges Riksbank Economic Commentaries 13.

regulatory framework does not necessarily require the change of the mandate of the Bank of England. A broader interpretation of its existing mandate about financial stability would suffice to justify such an approach.⁸⁸

Going further, the UK government could explicitly include environmental sustainability in the mandate of the Bank of England. This would permit a more pro-active use of central banks tools for facilitating the transition to a low-carbon economy and would fully align the operations of the Bank with the Paris Climate Agreement (which the Bank is party to).

A green re-interpretation or modification of the mandate of the Bank of England would justify the active use of central bank tools for the decarbonisation of the UK economy. Below we recommend how the Bank of England could contribute to the greening of UK banking through its monetary policy operations and financial regulation.

4.1 Monetary policy

Recommendation V: Green the collateral framework of the Bank of England's Monetary Policy Operations

Collateral frameworks are at the core of the Bank of England's liquidity operations. The eligibility criteria are extremely powerful and reverberate throughout the financial sector more widely. This is because the Bank requires collateral from commercial banks in exchange for issuing reserves that banks use to clear payments. Consequently, the assets which are eligible as collateral at the Bank of England inevitably become more valuable to the commercial banking sector, incentivising demand for them. In turn, aware that these eligible assets are important for commercial banks, investors and creditors seek to hold them as safe assets.⁸⁹ The resulting growth in demand for these eligible assets can increase their price and lower their yield.

Moreover, the Bank of England typically applies haircuts to the collateral it takes in exchange for reserves, and adjusts these haircuts depending on the risk profile of the asset; a higher (lower) haircut reduces (increases) the available central bank liquidity per eligible asset of collateral.⁹⁰ These haircuts also have a direct impact on the haircuts used by central counterparties in repo contracts.⁹¹

The importance of the collateral framework for financing conditions is verified by recent empirical evidence. It has been shown that eligibility criteria and haircuts within central bank

⁸⁸ Campiglio, E., Dafermos, Y., Monnin, P., Ryan-Collins, J., Schotten, G. and Tanaka, M. (2018). [‘Climate change challenges for central banks and financial regulators’](#), Nature Climate Change, 8 (6), 462-468.

⁸⁹ Van Lerven, F. (2018). [‘Reshaping finance for a 1.5c world: What the Bank of England needs to do for a Green Transition’](#), New Economics Foundation, November 2018.

⁹⁰ The haircut is the difference between the value of an asset and the amount of liquidity that a commercial bank can obtain by using this asset as collateral.

⁹¹ Mancini, L., Ranaldo, A. and Wrampelmeyer, J. (2015). [‘The euro interbank repo market’](#), The Review of Financial Studies, 29 (7), 1747-1779.

collateral frameworks have an impact on bond yields, credit availability and the interest rates on the loans provided to the non-financial sector.⁹²

As was explained in Section 2, the collateral framework used by the Bank of England does not take into account the role of climate change. Moreover, the haircuts applied to eligible collateral assets are set irrespective of the environmental impact of the activities that those financial instruments finance. By failing to adequately account for the climate impact in its collateral framework, the Bank of England risks biasing the allocation of capital towards carbon-intensive activities (i.e. by creating better financing conditions for these activities). This does not only lead to higher emissions in the short run, but it also deteriorates the carbon infrastructure lock-in effects. These lock-in effects increase the transition risks that the Bank of England tries in principle to tackle.

We suggest that the Bank of England climate-align its collateral framework by introducing climate-related criteria for the assets that it accepts as collateral. For example, based on the Green Public Taxonomy, loans or securities that are linked with projects that generate a large amount of greenhouse gas emissions – ‘superbrown assets’ - could be excluded from the collateral framework. In addition, the Bank of England could incorporate in its collateral framework taxonomy-eligible assets that are, for instance, related to projects on energy efficiency and renewables.

A climate-aligned collateral framework would also differentiate haircuts on green/brown assets. For example, haircuts on green assets could be adjusted downwards and haircuts on brown assets could be adjusted upwards.⁹³ By doing so, the demand for greener assets by banks could increase and the demand for browner assets could decline. Such measures could benefit the financing of the low-carbon transition.

The adjustment of haircuts could be dynamic: the haircut discounts and penalties could increase gradually within a pre-determined horizon, designed in cooperation with the Green Finance Taskforce. This would minimise the transition effects that the introduction of a green collateral framework would generate.

Recommendation VI: Use the NIB to steer bank credit towards low-carbon projects

The Labour Party’s plans to reorient bank credit to green activities via the National Investment Bank, regional development banks and Post Bank will pave the way for remedying these structural conditions. Green projects and activities are often regarded as riskier and the expected returns from such activities will often be longer-term in nature.

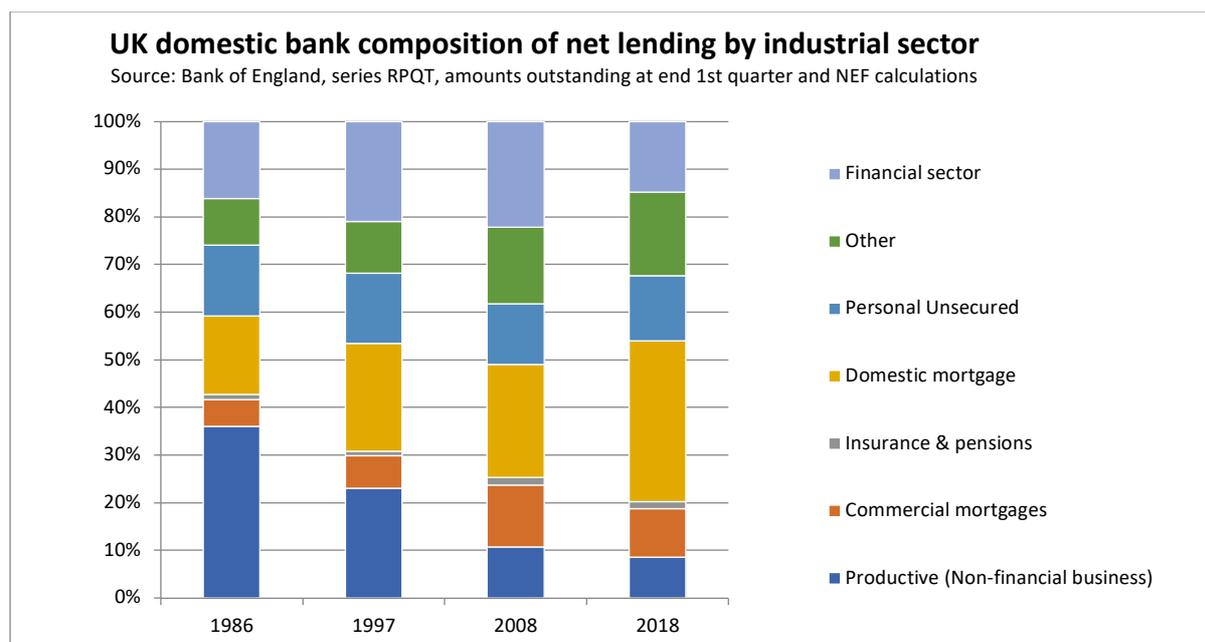
The allocation of credit by the banking sector is particularly unbalanced, with credit overwhelmingly directed at the property and financial sectors (Figure 4.1). Indeed, there is a fundamental scarcity of long-term patient finance available, while real borrowing costs remain

⁹² Cahn, C., Duquerroy, A. and Mullins, W. (2017). [‘Unconventional monetary policy and bank lending relationships’](#), Banque de France Working Paper 659; Mésonnier, J.S., O’Donnell, C. and Toutain, O. (2017). [‘The interest of being eligible’](#), Banque de France Working Paper 636.

⁹³ Schoenmaker, D. (2019). [‘Greening monetary policy’](#), Centre for Economic Policy Research Discussion Paper Series DP13576.

relatively high to non-financial firms. The provision of patient finance is markedly unappealing to the banking sector as it is long-term in nature, often more risky, and offers a trivial rate of return on equity when contrasted property and financial sector lending.⁹⁴ For example, the share of total bank lending to non-financial business has fallen from 36% in 1986 to 8.5% by the end of 2018, and bank lending to the property and financial sector grew from 40% to 60% for the same period. While, a recent Bank of England survey demonstrates that one out of five large firms and one in three SMEs are under-investing due to a lack of access to bank credit.⁹⁵

Figure 4.1: UK banks net lending, by industrial sector



Recommendation VII: Green the Bank of England’s Corporate Bond Purchase Scheme

The Bank of England has been committed to keep the stock of corporate bonds purchases at £10 billion.⁹⁶ As explained in Section 1, although corporate QE is intended to be ‘market neutral’, it implicitly favours climate-intensive sectors. In other words, the scheme is currently mis-aligned with a low-carbon economy. This could change by adopting a climate-aligned approach to the reinvestment of the cash flows that correspond to bonds that will be redeemed or will stop being held by the Bank. Such an approach would induce the Bank to reinvest in green bonds or bonds financing activities with a low carbon footprint.

Empirical research has shown that, since corporate QE increases the demand of specific bonds, the yields of these bonds tend to go down and the amount of bond issuance of the companies

⁹⁴ Macfarlane, L. and Berry, C. (2019). ‘[A new public banking ecosystem](#)’, Report to the Labour Party commissioned by the Communication Workers Union and The Democracy Collaborative.

⁹⁵ Cunliffe, J. (2017, February 8). ‘[Are firms under investing – and if so why?](#)’ Speech at the Greater Birmingham Chamber of Commerce Wednesday 8 February 2017.

⁹⁶ Bank of England (2019). ‘[Asset Purchase Facility \(APF\): Corporate bond purchase scheme reinvestment programme - market notice 1](#)’, August 2019.

that use these bonds as a financing instrument tend to go up.⁹⁷ Consequently, by greening the corporate QE reinvestments, the Bank of England would boost green investment and would make less favourable the credit conditions for brown investment. This would not only be beneficial for the level of carbon emissions, but it could also reduce the physical climate risks.⁹⁸ Although this effect might not be quantitatively strong, the greening of QE should still be a considered a complementary policy for the decarbonisation of the UK economy.

4.2 Banking regulation

Basel III specifies the capital and liquidity requirements that banks need to meet in order to be considered safe from a microprudential and macroprudential view.⁹⁹ Basel III also includes requirements about disclosure and risk management. As far as capital is concerned, there are three pillars. Pillar 1 sets out the minimum capital requirements for an institution based on a large number of criteria. Pillar 2 is an individual capital guidance requirement assessed by a bank's Internal Capital Adequacy Assessment Process (ICAAP) and the regulators view of that ICAAP. Pillar 2 also addresses firm specific risks, not adequately covered by Pillar 1 capital requirements. Finally, Pillar 3 requires that firms publicly disclose information about a number of issues, such as risks, capital adequacy and risk management processes.

In the UK, banks, building societies, credit unions, insurers and major investment firms are regulated by the Prudential Regulatory Authority (PRA) and the Financial Conduct Authority (FCA), both of which are part of the Bank of England. Basel III is implemented via Capital Requirements Directive (CRD) IV.¹⁰⁰

Recommendation VIII: Adopt Climate Calibrated Capital Adequacy Rules

Risk-weighted capital adequacy rules are a significant component of Basel III (and of CRD IV). These rules require that financial institutions hold a minimum amount of capital relative to risk-weighted assets. Required capital can act as a cushion to absorb losses when loans go bad. Risk weights can influence banks' profit margins for particular lending activities: a higher risk weight tends to make loans more expensive (as more capital is required to grant a loan), while a lower risk weight can make credit expansion cheaper (as less capital is required to grant a loan). So risk weights could affect the willingness of financial institutions to lend. They might also affect the cost of borrowing.

Conventional risk weights neglect the climate impact of assets. We thus propose that risk weights be adjusted to take into account the greenness/brownness of the assets that banks hold, based on the UK green/brown Taxonomy. In other words, we suggest a 'climate-based

⁹⁷ Boneva, L., De Roure, C. and Morley, B. (2018). [‘The impact of the Bank of England’s corporate bond purchase scheme on yield spreads’](#), Bank of England Working Paper 719; Todorov, K. (2019). [‘Quantify the quantitative easing: Impact on bonds and corporate debt issuance’](#), Journal of Financial Economics, <https://doi.org/10.1016/j.jfineco.2019.08.003>.

⁹⁸ Dafermos, Y., Nikolaidi, M. and Galanis, G. (2018). [‘Can green Quantitative Easing \(QE\) reduce global warming?’](#), Foundation for European Progressive Studies.

⁹⁹ BIS. [‘Basel Committee on Banking Supervision reforms - Basel III’](#)

¹⁰⁰ CRD IV consists of the Capital Requirements Directive (2013/36/EU) (CRD) and Capital Requirements Regulation (575/2013) (CRR).

risk weighting’ that would allow for the addition of climate related regulatory measures (Climate Calibrated Capital Adequacy Rules) to CRD IV.

The climate-based risk weighting could take two forms. The first form of climate-based risk weighting is what is commonly known as the ‘brown penalising factor’, which implies an increase in the risk weights of brown assets. This intervention would make carbon-intensive lending more expensive relative to low-carbon activities since banks would need to hold more capital against brown loans. In this respect, bank lending for carbon intensive activities would be directly dis-incentivised, whilst implicitly encouraging bank lending for low-carbon activities.

The second one would be what is commonly referred to as a ‘green supporting factor’. That is a reduction in the risk weight assigned to green asset. Such a reduction would encourage banks to provide more environmentally friendly loans to the economy since banks would have to hold less capital against these loans. It could also lead banks to reduce interest rates on green loans relative to interest rates on conventional loans.

The quantitative effects of such measures are unclear. In the academic literature there is no consensus on the precise effects of capital requirements and risk weights on lending and the cost of borrowing. For instance, it is not clear if the SME supporting factor that was introduced at the European level in 2014 was effective in stimulating credit. On the one hand, a study by EBA¹⁰¹ argues that it was not, but, on the other hand, two more recent empirical studies show that credit was stimulated, at least for medium-sized enterprises¹⁰². There is also evidence that capital requirements affect lending, but is not clear if this effect is quantitatively strong.¹⁰³

A further issue for consideration is that a green supporting factor could undermine financial stability by, first, reducing the capital that banks hold against assets and, second, supporting green credit of high risk. This might be a significant source of concern, in particular if the green economy expands substantially in the next years. However, since decarbonisation might also reduce physical financial risks, these potentially adverse effects should be compared with the positive financial effects of decarbonisation that would be caused by the green supporting factor (especially if this is implemented in many countries simultaneously). In addition, if the introduction of a green supporting factor is combined with a brown penalising factor, capital requirements are more likely to increase, at least in the first years of the implementation.

But it is clear that any consideration of introducing a green supporting factor should be carefully examined and, if it is decided to be introduced, it should be closely monitored in order to ensure that it will not undermine financial stability. Consideration should also be given to how the green supporting factor would interact with the existing SMEs supporting factor.

¹⁰¹ EBA. (2016). [‘EBA Report on SMEs and SME Supporting Factor’](#). European Banking Authority, EBA/OP/2016/04.

¹⁰² Mayordomo, S. and Rodríguez-Moreno, M. (2018). [‘Did the bank capital relief induced by the Supporting Factor enhance SME lending?’](#), Journal of Financial Intermediation, 36, 45-57; Lecarpentier, S., Lé, M., Fraise, H. and Dietsch, M. (2019). [‘Lower bank capital requirements as a policy tool to support credit to SMEs: evidence from a policy experiment’](#), EconomiX No. 2019-12, University of Paris Nanterre.

¹⁰³ Gambacorta, L. and Shin, H.S. (2018). [‘Why bank capital matters for monetary policy’](#), Journal of Financial Intermediation, 35, 17-29; Gropp, R., Mosk, T., Ongena, S. and Wix, C. (2018). [‘Banks response to higher capital requirements: evidence from a quasi-natural experiment’](#), The Review of Financial Studies, 32 (1), 266-299.

The introduction of the brown penalising factor also faces some challenges. If it is implemented abruptly, it could reduce economic activity since brown assets constitute a large part of our carbon-based economy. This, however, could be partially tackled by increasing the brown risk weights gradually.

Another issue is that the brown penalising factor could put UK financial institutions at a 'regulatory' disadvantage from a global perspective, leading them to securitise 'brown' loans. This could be addressed to some extent through the recommendations made in Section 5 about the brown penalising haircuts and the brown penalising factor for globally systemic banks.

The Climate Calibrated Capital Adequacy Rules (both the green supporting and the brown penalising factor) could be initially introduced in CRD IV. Credit risk weightings could be 'rebased' to accommodate a climate based risk weighting where there may be overlap. First, climate based risk weights would need to be a component of Pillar 1 and the overall capital requirement. Second, the Bank of England (through the PRA and the FCA) would have scope (where applicable) through Pillar 2A (idiosyncratic risks), 2B (capital planning buffer) and systemic buffers to adjust capital required in relation to an institutions total risk exposure level. This would take into account the greater understanding, analysis, risk and 'green' metrics required under the Climate Calibrated Capital Rules. Governance and risk management too will have to be enhanced to meet more stringent Pillar 2 reporting requirements to the PRA and FCA. Both would add to financial soundness of regulated institutions.

In the longer run, the UK could also work with the EU and others to implement EU wide and global Climate Calibrated Capital Rules. Concurrently, the Bank of England, as a member of the Basel Committee on Banking Supervision, could propose the inclusion of the Climate Calibrated Capital Rules to Basel III.

However, the greening of financial regulation through Climate Calibrated Capital Rules might not be sufficient. FCA and PRA could also consider the banning of lending to activities with an extremely high carbon footprint. This would be a useful tool for accelerating the decarbonisation of UK bank lending.

5. GREENING SHADOW BANKING THROUGH ROBUST REGULATION

The question of greening shadow banking is critical to sustainable finance agendas.

According to the Financial Stability Board, shadow banking is a version of market-based finance. Following the standard activities-based definition, shadow banking involves collateral-based financing of positions in capital and derivative markets.¹⁰⁴ Shadow banking has cash rich institutional investors and their asset managers. These finance, via collateral chains, leverage-intensive institutional investors or banks. Global banks typically offer their balance sheet to connect cash-rich shadow banks with leverage-hungry shadow banks. Structurally, the rise of institutional investors reflects the erosion of the key functions of the welfare state and the tax state – from public pensions, public housing and free healthcare provision to adequate taxation of high net worth individuals and corporations – replaced by pension funds, insurance companies and other institutional cash pools associated with high net worth individuals and tax-optimising corporations¹⁰⁵, which seek money-like financial instruments in the shadow banking world. Leverage-hungry funds or banks with capital market activities provide such instruments. The ensuing financial market structure generates systemic vulnerabilities arising via interconnectedness, liquidity and leverage.¹⁰⁶

The climate crisis extends the range of systemic fragilities to include climate-vulnerable assets. Shadow banks have systemic mark-to-market exposure to climate-vulnerable assets, be it directly by issuing these assets (lending to carbon-intensive activities), or indirectly, by lending/borrowing against climate-vulnerable assets to/from other banks and shadow banks.

Indeed, institutional investors and their asset managers¹⁰⁷ are not just increasingly systemic nodes in a highly interconnected global financial system.¹⁰⁸ They are important actors on their own for green finance agendas. As they have replaced individual shareholders and concentrated ownership of equities, their shareholder power allows them to exercise significant influence over corporate policies, particularly in high-carbon sectors. Their portfolio decisions influence capital allocation, particularly given the growing importance of index investing.

The UK plays an important role in global shadow banking/market-based finance. Its investment management industry is the second largest after the US.¹⁰⁹ The Investment Association estimated in September 2019 that UK investment managers collectively looked after £9.1

¹⁰⁴ See the European Systemic Risk Board's (2018). [Shadow Banking Monitor](#). See also FSB (2015). [Transforming Shadow Banking into Resilient Market-based Finance: An Overview of Progress](#)

¹⁰⁵ See Pozsar, Z. (2011). ['Institutional Cash Pools and the Triffin Dilemma of the U.S. Banking System'](#), IMF Working Paper 11/190 .

¹⁰⁶ See ESRB (2018). ['EU Shadow Banking Monitor'](#), European Systemic Risk Board No 3, September 2018.

¹⁰⁷ FSB (2017). estimated in 2015 that 'third-party asset managers as a group only manage about one-third of the total financial assets of pension funds, SWFs, insurance companies and high net worth individuals. The remaining assets are managed by the investor or asset owner without the help of independent asset managers'. See FSB (2018). ['Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities'](#), January 2017.

¹⁰⁸ Haldane, A. (2014). [The Age of Asset Management](#). Speech at the London Business School.

¹⁰⁹ The Investment Association (2019). ['Investment Management in the UK 2018-2019: The Investment Association Annual Survey'](#), September 2019.

trillion, with around £2.2 trillion ‘managed according to some form of responsible investment criteria’ (p32). In turn, retail investment flows into UK funds traditionally categorised as ‘ethical’ has remained proportionately unchanged in the last decade (1.3%), although there are some signs of an uptick in the last two years¹¹⁰.

Through impact investment, institutional investors have pioneered a series of sustainability strategies that aim to shift funding they provide via capital markets to more sustainable companies. At the forefront of such efforts, several pension funds and insurance companies have embraced divestment. For example, in 2016 Waltham Forest Council announced that its pension fund would gradually divest from fossil fuel- related investment.¹¹¹ BMO Global Asset Management’s ‘Responsible Funds’ has started divesting, although it still engages with fossil fuel companies.¹¹² Similarly, some insurance companies have also reduced coal-related holdings. For example, Aviva and Legal & General have decided to start divesting from some coal companies (although still engaging with them).¹¹³ Pension scheme trustees are asking the Financial Conduct Authority (FCA) to help ensure that asset managers act on their voting instructions related to climate change¹¹⁴.

Despite these divestments, UK insurance companies have made much less progress compared to other European Insurance companies. Allianz and AXA, some of the largest insurance companies in the world, have strengthened their divestment threshold in order to exclude more companies from their portfolio. Allianz also announced its aim to become coal-free by 2040. But the overall divestment strategies of both pension funds and insurance companies at the global level are still far from being in line with the targets of the Paris Agreement. Efforts for divestment are further complicated by the growing importance of index investment that track the performance of a benchmark index. If investors allocate funds to passive investment, they may inadvertently increase exposure to brown assets and the carbon footprint of their portfolios as index providers decide what stocks make up the index.

In sum, through impact investment, institutional investors have pioneered a series of sustainability strategies that aim to shift funding they provide via capital markets to more sustainable companies. But a faster transition path, particularly given the reliance of UK institutional investors and asset managers on ESG approaches, requires a stronger regulatory regime.

The greening of the UK market-based finance faces two challenges:

- a) there are difficulties in accurately mapping climate exposures due to voluntary disclosure and the subjectivity of ESG approaches;
- b) the scope of cross-border activities opens up the possibility of green avoidance and green evasion.

¹¹⁰ Investment Association (2018). [‘Investment Management in the UK 2017-2018: The Investment Association Annual Survey’](#), September 2018.

¹¹¹ Gibson, E., Shoraka, S., Duff, D., Benjamin, J. and Lander, R.(2017). [‘Councils: Fuelling the fire A new report on the local government pension scheme and fossil fuels’](#), November 2017.

¹¹² Friends of the Earth (2018). [‘Briefing: Pension funds’ engagement with fossil fuel companies’](#), March 2018.

¹¹³ Unfriend Coal (2018). [‘Insuring coal no more: The 2018 scorecard on insurance, coal and climate change’](#), December 2018.

¹¹⁴ Financial Times [‘Pension trustees test UK’s revamped stewardship code’](#).

We examine each in turn.

a) Difficulties in accurately mapping climate exposures

There is growing international consensus about the importance of disclosure of climate exposures for banks and shadow banks. Yet there is little agreement on the appropriate framework or taxonomy for disclosure, and on how and whether to make disclosure mandatory.

This confronts both regulators and private investors with significant uncertainties about climate exposures. The Investment Association, for instance, cautioned that accurate measurements are difficult because of the voluntary character of disclosure and the multiplicity of ESG approaches. The latest survey of UK assessment management suggests that negative screening is the most commonly used (10% of assets), followed by best-in-class and sustainability-themed investments (less than 1%), but clear distinctions are difficult to draw given the subjective understanding of those categories by different types of investors.

Other disclosure strategies suffer from similar conceptual and methodological shortcomings. Take for instance the UK's Green Finance Strategy published in July 2019 by the Conservative government. The strategy notes that occupational pension schemes will have to publish their policy on financially material considerations, including those on climate change, from October 2019. It points to the Transitions Pathways Initiative (TPI) as an example of pension funds going green. By July 2019, investors with over £10 trillion assets under management signed up to the TPI.

The TPI is an asset-owner led initiative that provides asset owners with an assessment of companies' preparedness for the transition to a low-carbon economy. Its highest-ranking level, Strategic Assessment, consists of five indicators with a yes/no answer, and includes companies that provide an affirmative answer to some of these questions, without specifying clearly what the benchmarks for those measures are (see Table 5.1). In fact, several of the oil companies that the TPI ranks at the Strategic Assessment level continue to invest heavily in projects that will accelerate global warming, in contradiction with the aims of the Paris Agreement. The pension funds guided by the TPI risk funding brown activities, contrary to their greening ambitions, with potentially significant exposures to stranded assets.

Table 5.1: Indicators for the alignment of financial institutions with climate targets

| Level 4: Strategic Assessment | |
|-------------------------------|---|
| Yes/No | Indicators |
| Yes | Has the company set long-term quantitative targets for reducing its greenhouse gas emissions? |
| Yes | Has the company incorporated environmental, social and governance issues into executive remuneration? |
| No | Does the company incorporate climate change risks and opportunities in their strategy? |
| No | Does the company undertake climate scenario planning? |
| Yes | Does the company disclose an internal price of carbon? |

Source: Transition Pathway Initiative

The ambiguity engendered by a multiplicity of disclosure frameworks risks amplifying the exposure of pension funds and other institutional investors to climate risks. It may encourage some to structure their portfolios as if their fiduciary duties towards climate change disclosure and portfolio management have been met.

Recommendation IX: Extend the mandatory climate-related financial disclosures to non-bank financial institutions

Investors increasingly recognise that a common disclosure framework is necessary. For instance, the Investment Association 2019 report notes that its members expect the integration of ESG factors – that is, ‘the systematic and explicit inclusion by investment managers of environmental social, and governance factors into traditional financial analysis’ – to become the norm. But the integration of ESG factors is governed by misincentives – potential for ratings shopping and greenwashing – that risk delaying and even diverting the efforts to put the economy on a low-carbon path and to make institutional investors’ portfolios resilient to climate risks.

An ambitious plan to reorient institutional investors should legislate mandatory disclosure according to the Green Public Taxonomy discussed above. It would build on consultations with the Pensions Regulator, the FCA and industry representatives, and feed into the guidance for pension schemes on ‘climate-related practices across governance, risk management, scenario analysis and disclosure’.

This should not raise issues of overlap between the Green Public Taxonomy and the TCFD. TCFD aims to identify risks, whereas the Green Public Taxonomy will identify sustainable activities and assets based on lending for those activities via capital market instruments. In parallel, the Green Finance Taskforce should make the TCFD disclosure mandatory, including for institutional investors and asset managers.

b) The scope of cross-border activities opens up the possibility of green avoidance and green evasion

The UK's Green Finance Strategy outlines a series of steps to align institutional investment with climate change goals. It essentially promotes the 'deregulated decarbonisation' approach to market-based finance, which has little if any potential to adequately respond to the urgency of climate change.

A Sustainable Finance strategy that aims at rapid decarbonisation should harness the UK's global leadership to promote a robust low-carbon transition, by pioneering credible public metrics and regulatory frameworks for market-based finance. Without a Green Public Taxonomy and credible rules to govern overseas investments, UK institutional investors have significant exposure to climate risks and greenwashing, while the UK economy is deprived of significant financing for green activities.

A global approach is necessary because of the internationalised activities of UK based institutional investors and the UK asset management industry.

US-owned investment managers play a critical role: whereas UK-owned managers account for 43% of assets managed in the UK, this is less than the 44% represented by US-owned funds, up from 28% in 2008.¹¹⁵ Assets managed by European-owned firms remain at a relatively low proportion of total assets managed in the UK, at around 10%. *UK-based managers collect 60% of their funds from UK based (mostly institutional) investors but invest only 20% in UK assets*¹¹⁶. This implies that there is significant scope for re-orienting investor flows into UK green assets through regulatory action.

The UK asset management industry follows the global trend towards passive investment. Figures from the Investment Association suggest that 74% of assets are managed on an active basis, down from 84% in 2009.

The UK exchange-traded funds market does not have the scale to attract much of the passive investment flows¹¹⁷. Assets in UK-Listed ETFs increased from £11 billion to £250 billion between 2008 and 2019. In contrast, the US ETF market has reached \$3.4 trillion by 2019, of which \$2.7 trillion are held in products tracking equities markets, and \$600 billion into corporate and US government bonds. Issuance is highly concentrated in the hands of the largest three asset managers. Some ETFs are marketed under an ESG label.

The reliance of UK institutional investors on overseas passive investments should be tackled as an issue pertinent to the transition to a low-carbon economy. There is a risk that index funds will become 'holders of last resort' of fossil fuel assets from which active funds have

¹¹⁵ These numbers refer to the members of the Investment Association, who collectively manage around GBP 7.7 trillion assets, out of an estimated GBP 9 trillion assets under management in the UK. See Investment Association (2019). ['Investment Management in the UK 2018-2019: The Investment Association Annual Survey'](#), September 2019.

¹¹⁶ According to IA, its members held '1.6 trillion in UK equities, corporate bonds, commercial property and, increasingly in recent years, in infrastructure and direct lending' in 2018.

¹¹⁷ Note the most, but not all, ETFs are passive.

divested.¹¹⁸ There are also risks that while the UK banking system greens fast under an ambitious Sustainable Finance strategy, UK based institutional investors continue to maintain significant carbon footprints through their index fund investments overseas. This may leave institutional investors exposed to stranded assets, it deprives the UK economy of green financing, and creates systemic fragilities through the exposure of institutional investors to brown assets.

Recommendation X: Encourage the introduction of green supporting and brown penalising haircuts and margins for market-based finance

Investors participate daily in securities financing transactions (SFTs), such as repo agreements and securities lending. In these transactions, securities are used as collateral. The haircut on this collateral (the difference between the market value of an asset and the purchase price) determines the amount of financing that (shadow) banks have available to finance new assets or lend against those assets. The higher the haircut, the higher the implicit cost of financing securities positions and the lower the build-up of leverage. Margin requirements on derivative positions (i.e. the amount of collateral that investors should hold in a margin account) have been introduced since the global financial crisis to reduce systemic vulnerability and to limit the build-up of uncollateralized exposures. Margin is more effective than capital requirements because it protects financial institutions against the counterparty defaults, and because it is more 'targeted' and dynamic.¹¹⁹

The macroprudential case¹²⁰ for margins and haircuts should incorporate climate concerns. While collateral lubricates market-based finance, margins and haircuts are currently set independently of the environmental impact of the underlying collateral. This mobilises credit to activities with detrimental environmental impacts. At the same time, it creates mark to market exposures, via collateral chains, to the sudden, climate related shocks in the price and liquidity of those collateral securities.

In order to support the transition to a low-carbon economy, margins and haircuts could be recalibrated on the basis of the greenness and the brownness of the assets deployed as collateral. Brown penalising haircuts and margins would make brown assets less desirable in financial markets, having indirect effects on the cost of borrowing of those firms that issue these securities. On the other hand, green supporting haircuts and margins could improve the financing conditions for green projects. Certified green bonds and green asset-backed securities are examples of assets that could face lower haircuts for a given level of credit quality. The Green Finance Taskforce should set the levels and adjust them dynamically in line with progress towards decarbonization targets.

The design and implementation of climate-aligned haircuts and margins could rely on the framework that the Financial Stability Board has provided for counter-cyclical haircuts and

¹¹⁸ Jahnke, P. (2019). [‘Holders of Last Resort: The Role of Index Funds and Index Providers in Divestment and Climate’](#), SSRN working paper.

¹¹⁹ See BIS (2013). [‘Margin requirements for non-centrally cleared derivatives’](#), September 2013.

¹²⁰ ECB (2016). [‘Financial Stability Review: Special features’](#), May 2016

margins for securities financing transactions¹²¹. This would apply as the FSB originally envisaged, to all securities financing transactions, indifferent whether these involve banks, shadow banks, or a combination of the two. In so doing, the scope for banks to engage in brown regulatory arbitrage reduces considerably.

The Green Finance Taskforce could play a leading role in advocating for the FSB to move towards this direction. The Bank of England could also support such a development by establishing a green collateral framework. This framework could be deployed as a basis for the FSB's climate-aligned calibrations of haircuts and margins.

However, the adjustment of haircuts might not be enough. The FSB could prohibit the use of excessively 'brown' securities as collateral in SFTs and derivatives transactions. Such prohibitions could be phased in, similar to Basel III liquidity and stable funding rules, allowing time for investors to adjust to that without causing significant transition risks.

Similarly, to reduce the potential for regulatory arbitrage via passive investment abroad, the Green Finance Taskforce could contemplate a Financial Transaction Tax on brown ETFs. The Green FTT could use the framework of the European FTT¹²² or the recent Intelligence Capital report to tax trading of ETF shares where those ETFs track brown equities or fixed income instruments¹²³.

Recommendation XI: Encourage the introduction of a brown penalising factor for Global Systemically Important Banks

According to Basel III, Global banks that are considered to be systematically important need to hold additional common equity Tier 1 capital. This buffer can range between 0% and 3.5%. Global Systemically Important banks (G-SIBs) are identified based on a number of criteria, such as size, complexity and interconnectedness.¹²⁴

The brownness of the assets in which G-SIBs invest could be taken into account when the buffer is determined. This could take the form of additional requirements on top of the existing ones. Alternatively, the brownness of the assets could be considered as one of the criteria that should be taken into account when the buffer is determined, without changing the upper limit of 3.5%. The rationale of introducing a brown penalising factor could be based either on risk considerations (since brown assets face higher climate transition risks) or more directly on the need for G-SIBs to play a more active role in the process of decarbonisation. Given the prominent role of GSIBs in the City of London, the introduction of such a brown penalising factor could initiate a major shift towards less carbon-intensive investments in the UK financial system.

¹²¹ FSB (2014). '[Strengthening Oversight and Regulation of Shadow Banking Regulatory framework for haircuts on non-centrally cleared securities financing transactions](#)', October 2014.

¹²² See the [European Commission](#) proposals for a Financial Transactions Tax

¹²³ See also Intelligence Capital (2019) Reinforcing Resilience: Making the UK a Citadel of Long-Term Finance; Labour (2019). '[Financial Transaction](#)', September 2019.

¹²⁴ For the recent required levels of additional capital buffer for G-SIBs, see FSB (2018). '[2018 list of global systemically important banks \(G-SIBs\)](#)'. Financial Stability Board, 16 November 2018.

Therefore, the UK regulators could encourage the introduction of these additional requirements in Basel III. It should be pointed out that if this recommendation is implemented in combination with Recommendation X, some G-SIBs may be penalised twice for their exposure to brown assets. Although this might reinforce the transition effects, it will be beneficial for the decarbonisation of shadow banking activities, since many G-SIBs engage substantially in such activities.

Conclusions

The financial system is a key participant in steering our economy towards decarbonisation. Actions to date have been encouraging but in no way will they meet the level of urgency required to avert the large physical and environmental risks of climate change.

The development of a climate-aligned UK financial system is thus a prerequisite. The proposals to establish a new institutional architecture will set the stage for the implementation of green monetary and financial policies.

The building of the green/brown taxonomy is crucial to objectively assess the climate change impact of business activities and a core part of the process of promoting behavioural change in financial institutions to actively support climate change initiatives.

The proposal for the mandatory disclosure regime too will make use of the green/brown taxonomy for reporting purposes in addition to the methodologies in development by the TCFD and the NGFS. Disclosures should encompass transition and physical climate risks, with inclusion in Pillar 2 (regulatory) and Pillar 3 (public disclosures) for financial firms. This would require financial firms to address such risks with appropriate capital reserves.

Transparency is vital to ensure ‘buy-in’ from business and the public. Accountability of the finance sector for progress must be demonstrated to the public that timely and meaningful action is being taken. The Green Finance Taskforce, with a mandate to monitor progress in greening private finance, tackling transition risks and responding to barriers in the move towards decarbonization, would ensure the coordination of activities across the finance sector and regulatory bodies.

The Bank of England will need to reinterpret their existing mandate of price and financial stability. Climate change risks will affect both. The BoE has played a leading role at the NGFS and recognition of the risks. The BoE can do more to align climate change mitigation and decarbonisation with its existing mandate. The BoE should take a broader view of climate change risks and the impact on financial stability, to avoid being left behind by events if it does not proactively upskill on climate issues and risk analysis and take forward necessary regulatory actions within its mandate.

The reinterpretation or modification of the BoE's mandate necessarily leads to using the various tools at its disposal. The proposed taxonomy could be used to reset the eligibility criteria in the BoE's collateral framework and its liquidity operations as well as for the maintaining of the stock of corporate bonds under the Corporate Bond Purchase Scheme. Changes to eligibility criteria would promote the use of green bonds issued by governments, supranational entities,

highly rated corporates and asset backed securities in support of decarbonisation and environmental sustainability.

The adoption of the climate calibrated capital adequacy rules would see financial institutions steering financing towards decarbonisation and environmental sustainability. Effectively a price is put on creating negative externalities by the financing of brown activities, while regulatory capital reductions may be given for the financing of 'green activities'. The scope of any regulatory capital reduction would need to be assessed in light of overall Pillar 1 risks and Pillar 2 risk analysis. The assessment should take into account the analysis of 'green' metrics required under the Climate Calibrated Capital Rules and its impact on credit risk; governance and risk management. Similarly for Global Systemically Important Banks (G-SIBs), the determination of the additional capital requirement could include the extent of green and brown assets, with decarbonising activities as a positive factor for a capital requirement reduction.

The Bank of England again may need to take a leading role as a member of the Basel committee on banking supervision and the NGFS to promote global adoption of Climate Calibrated Capital Rules and the G-SIB buffer.

Although many shadow banks are regulated by the FCA or the PRA, off-shore funds managed by on-shore fund managers are not. The scope of disclosures of on-shore funds too is limited and voluntary when it comes to climate disclosures. The asset management industry has various voluntary ESG initiatives with different approaches to measuring climate change risks. The proposed Green Public Taxonomy will solve this issue. Funds sold in the UK should be subject to mandatory disclosures using the Green Public Taxonomy and using the approach of the TCFD in risk identification. A global approach will be needed given the global nature of the asset management industry.

The securities financing market can also support green finance through the approach promulgated by the Financial Stability Board for countercyclical haircuts and margins. The recommendation would be to give favourable haircuts and margins to green securities and high haircuts and margin requirements to brown securities. It could apply to all securities financing transactions, indifferent whether these involve banks, shadow banks, or a combination of the two. This would require a global effort given the international nature of the securities financing market. The Green Finance Taskforce may need to play a key role in advocating for this change with the FSB and other offshore regulators.

