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Greening the financial system and the role of central banks

Observations on central banks and the Network for Greening the Financial System

Summary

Over the last four years, central banks, regulators for banks, pension funds and insurance companies have become the new key actors accelerating the financial sectors' focus on sustainable and responsible investing.

Climate change has, and will continue to be a key area of focus given the potential risks it poses to financial stability. Central banks have largely been focused on encouraging disclosure among corporates and investors as it relates to climate risk and hence supporting the work of the Task Force for Climate-related Financial Disclosure (TCFD).

Beyond encouraging improved disclosure, we suggest that there is more that central banks can do to support the low-carbon transition and the Sustainable Development Goals without compromising their mandates. This could be in the form of monetary policy settings, building the evidence base for differentiated capital and reserve requirement ratios, and establishing responsible investment frameworks for central bank balance sheets, reserves and their own pension funds.

The expansion in central bank balance sheets, the surge in official foreign exchange holdings, most notably among EM central banks, as well as the adoption of more innovative investment strategies by central banks may provide an opportunity for more direct ESG and climate risk related investment strategies.

We suggest that developed market central banks could support their emerging market counter-parts by leading, by example through implementing responsible investment frameworks for their reserves and pensions. For instance, central banks could become signatories to the Principles for Responsible Investing (PRI), require ESG integration in funds/benchmarks, and expect investee and government engagement. In addition, the improvements in climate risk data also permits a more robust integration of physical as well as transition risk into investment portfolios.

The increasing popularity of passive indices and specifically ESG and low carbon investing provides an easy first step for shifting a portfolio towards responsible investment.

Finally, the debate on a 'green supporting factor/brown penalising factor' in capital reserve requirements is likely to continue for some time. However, we believe the idea of a green supporting factor for green mortgages is logically compelling and deserves more research. For instance, central banks could examine how they could support the creation of standardised energy efficient mortgages, which could lead to green asset backed bonds. This could provide the evidence basis for considering a 'green supporting factor'. A 'grey penalising factor' could be considered due to the need to quickly cut emissions.

We believe, the establishment of the Network for Greening the Financial System (NGFS) and central banks' track record in promoting best practises, places them in a unique position to influence broader financial market behaviors and accelerate the transition to a more socially and environmentally sustainable economy and financial system.

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The context for central banks' role in greening the financial sytem

Identifying and addressing barriers to financing sustainable development.

Introduction

Achieving the Paris climate agreement and meeting the objectives of the United Nations' Sustainable Development Goals (SDGs) will require significant private and public sector investment. The OECD estimates that USD95 trillion of investment will be required between 2016 and 2030 in energy, transport, water and telecommunications infrastructure, or around USD6.3 trillion per annum, Figure 1. This compares with current annual infrastructure spending of between USD3.4-4.4 trillion. Inevitably the nature of these investments, such as low or high carbon energy systems, will determine future growth and prosperity as well as the level of climate change impacts. The following table is only a partial estimate of the capital necessary for meeting the SDGs.

FIGURE 1. SUSTAINABLE INFRASTRUCTURE INVESTMENT REQUIREMENTS

		Annual average	Cumulative
Energy supply	Renewable power generation, transmission and distribution	0.7	11.2
	Fossil fuel supply chain	1.0	14.3
Energy efficiency		0.4	6.6
Transport infrastructure	Road	2.1	31.8
	Rail	0.4	4.6
	Airports and ports	0.2	2.7
Water and Sanitation		0.9	13.6
Telecoms		0.6	8.3
Total		**6.3**	**94.9**

USD 2015 trillion

Source: OECD (May 2017). Investing in Climate, Investing in Growth

As a result, a significant green investment gap exists currently. Up until now the success of government policy to encourage the low carbon transition, for example through carbon pricing schemes has been disappointing.

Note that the OECD estimates are based on scenarios from the International Energy Agency, which have been criticized for not fuly representing the energy system changes necessary for meeting the Paris Agrement goals. As well, previous IEA scenarios have widely underestimated the acceleration of renewable energy investment and technology cost reductions (Oil Change International 2017).

In 2014, UN Environment established the "Inquiry into the Design of a Sustainable Financial System" to advance options to improve the financial system's effectiveness in mobilizing capital towards a green and inclusive economy. Over its four years of operation, the Inquiry engaged with financial institutions, policy makers, regulators and civil society in more than 20 countries, produced over 120 reports and briefings. The Inquiry is credited with playing a key role to place sustainable development firmly on the agenda of financial policy makers and financial institutions like central banks. Indeed, one of the discussion papers published by the Inquiry focused on the role of central banks.

One observation from the Inquiry's final report stated:

> "**At the outset, it would have been a challenge to find a small handful of financial regulators or central bank governors willing to go on record that "sustainable development was part of their business". Today, four years later, it would be hard to find one who would go on record to say that their work had nothing to do with sustainable development, although there is much to be done in converting such developments into practice"** *(Inquiry April 2018).*

There are now many more initiatives and policies that aim to create more coordinated efforts to mainstream sustainable finance. In this regard, the role of central banks and finance ministries, in breaking down barriers and accelerating investment in environmental and social challenges is critical. Central banks in particular act as important role models within the financial system. Indeed we suggest that central banks' macro- and micro-prudential activities could be even more efficiently deployed to promote sustainable finance. This could be particularly relevant in emerging markets where environmental risk, and hence the threat to financial stability, tends to be more elevated.

With the establishment of the Network for Greening the Financial System (NGFS), we believe that central banks are aiming to build on their long-track record of collaboration and promoting best practise and this places them in a unique position to influence broader financial market behaviours. However, and in spite of their more activist role since the global financial crisis, we believe that central banks are only starting their efforts to accelerate a "just transition" to a greener and more sustainable financial system and real economy. This explains why more research is focused in this area.

In this paper, we assess the expanding role of central bank mandates to include financial stability and specifically the systemic risks posed by climate change and other sustainability issues. While there has been increasing attention on greater disclosure of financial institutions exposure to climate change related shocks, we explore the various policy choices certain central banks have adopted in recent years and the extent to which these promote, or otherwise, the low-carbon transition. We then assess the extent to which central banks can adopt ESG into their investment approach and specifically as they relate to their balance sheet and FX reserve management strategies.

Central bank mandates

From targeting full employment, price and exchange rate stability, central bank mandates are encompassing financial stability and specifically as it relates to climate risk

The functions of a central bank include setting monetary policy, the smooth functioning of payment system operations, banking supervision and lender of last resort. In terms of the mandates a central bank can pursue, these encompass objectives such as high or full employment, exchange rate targeting as well as long-term price and financial stability. Naturally central bank mandates have evolved over time, and tend to be a function of prevailing economic and political conditions.

In the Great Moderation period between the mid-1980s and 2007, central banks prioritized price stability which become self-reinforcing as business cycle volatility declined and inflation was brought under control. However, following the global financial crisis, central banks have adopted non-conventional monetary policies.

Central banks have a critical role to play in safeguarding financial stability since financial instability can have significant implications for economic growth, price stability and the monetary policy transmission process. In addition, central banks are the ultimate source of liquidity for the economy, and appropriate liquidity provision is crucial to financial stability.

Central bank interventions to preserve financial stability can encompass a variety of measures such as the Fed's role after the Long-Term Capital Management (LTCM) collapse in 1998, the European Central Bank's role in the Eurozone sovereign debt crises, global central banks' unprecedented emergency loans to investment banks during the Global Financial Crisis and a central bank's role in a domestic currency crisis.

The next evolution of central banks' role is now related to new dimensions of risk and opportunities related to climate change and the SDGs. Climate change and the SDGs represent economically and socially material risks and opportunities for investors and society at both a macro and micro level, as shown in Figure 2.

FIGURE 2. MACRO AND MICRO RISKS AND OPPORTUNITIES LINKED TO CLIMATE CHANGE AND THE UNITED NATGIONS' SUSTAINABLE DEVELOPMENT GOALS

	Risks	*Opportunities*
Macro	Failing to achieve climate change emission reduction goals and the SDGs will create macro financial risks for large institutional, universal owner investors	Achieving the SDGs will be a key driver of global GDP growth over the next decade and beyond
Micro	Climate change and the SDGs provide a forward looking risk framework for specific industries, companies, geographies and countries. i.e. the SDGs forecast future government policy making and stakeholder/societal requirements and expectactions	Companies moving towards sustainable business models are a clear investment opportunity

Source: PRI (September 2017)

Bank of England Governor Mark Carney's identification of the potential financial stability risks of climate change, clearly identifies macro risks. Specifically, climate risks come in the form of:

(i) **Physical risk** and the impact of extreme weather events on households, firms and the broader economy

(ii) **Transition risk** such that financial valuations of investments could be re-priced to account for the transition to a low carbon economy. This revaluation risk is also in danger of being aggravated by technological change and changes in consumer preferences and market norms.

(iii) **Liability risk** and seeking compensation from those responsible for the causes of climate change

Macro opportunities can be seen in the analysis from the CEO led Business and Sustainable Development Commission's 'Better Business, Better World' report (BSDC 2017) which identified USD12 trillion of economic growth opportunities around the SDGs by 2030, or more than 10% of global output. More than 50% of this opportunity located in developing countries and the value of the market opportunity could be 40% higher if environmental externalities like climate change were truly accounted for. Achieving the SDGs could also create 380m new jobs by 2030, 90% of which in developing countries.

FTSE Russell (June 2018) estimates that there are now some 3,000 listed companies that have some revenue exposure to a broad definition of the green economy (products & services related to renewables, energy efficiency, water, waste and pollution reduction). The number of companies has grown 20% since 2009 and represents 6% of the listed equity market – a similar size to the oil and gas sector. Accelerating green investment could see the green economy come to rival the size of the global health care industry.

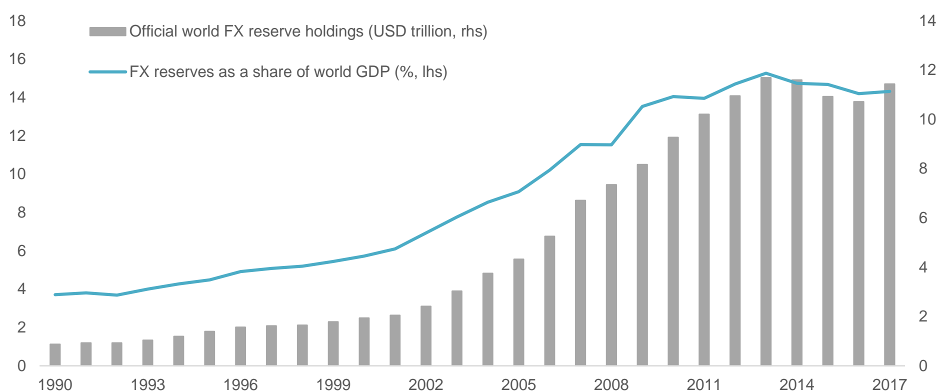
Central bank FX reserve management and balance sheet expansion

Supporting a green and sustainable financial system and real economy

Over the past two decades, world official foreign exchange reserve holdings have increased six-fold in nominal US dollar terms and trebled as a share of world GDP, Figure 3. As of June 2018, world FX reserve holdings stood at USD11.8 trillion, of which approximately two-thirds were held by emerging market countries. Central banks and their reserve holdings therefore play an important role in the global financial system.

In comparison, the number of signatories to the Principles for Responsible Investment has reached over 1,900 and in terms of combined assets under management amount to USD81.7 trillion as of April 2018 (PRI April 2018).

FIGURE 3. OFFICIAL WORLD FOREIGN EXCHANGE RESERVE HOLDINGS TOTAL AND A SHARE OF WORLD GDP



Source: IMF, World Bank, Bloomberg Finance, 2017

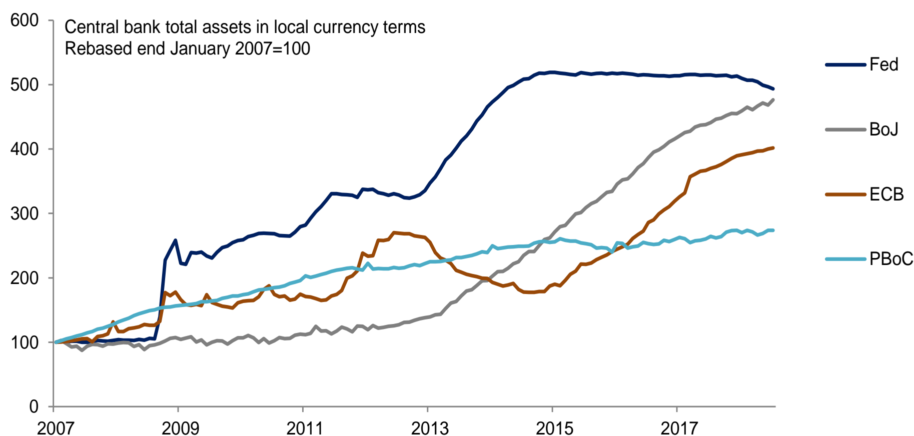
The significant growth in FX reserves can be traced back to the 1997 Asian financial crisis and the Russian sovereign default a year later. A further acceleration in reserve growth occurred after the 2007-09 global financial crisis. Part of the motivations of this reserve accumulation was to provide heightened levels of protection in the event of future economic and financial shocks with reserve growth aided by a strong depreciation in EM currencies against the US dollar, which fuelled export led recoveries.

Not surprisingly the increased level of official FX reserves alongside a collapse in global interest rates in more recent years has led central banks, most notably across emerging market countries, to consider and in many instances adopt a more active role in the management of their FX reserves. A larger pool of FX reserves to deploy alongside the search for yield has meant central banks are adopting more innovative investment strategies that could be considered to be comparable to traditional institutional investors. In certain instances, this is leading to the increasing reliance of specialist external asset managers to gain access to asset classes where in-house expertise in lacking (RBA, March 2018).

The use of external managers and the integration of ESG into central banks own-account investments is already occurring to some degree but its widespread adoption should be encouraged. For example, the Dutch central bank states that it aims to integrate international ESG aspects in the implementation of our investment policy and believe that targets for returns on investment should go hand in hand with socially responsible investment (De Nederlandsche Bank 2017). A similar approach is pursued by the Banque de France. In July 2018, the Bank of Finland also announced that it was applying new responsible investment standards to its own assets (Responsible Investor July 2018).

The financial crisis has also led to the appearance of non-conventional monetary policies such as quantitative easing. Central bank asset purchases across a wide range of asset classes, such as equities, sovereign and corporate bonds, has led to the rapid expansion of central bank balance sheets, Figure 4.

FIGURE 4. THE GROWTH IN CENTRAL BANK BALANCE SHEETS SINCE 2007



Source: Bloomberg Finance, 2017

Work conducted by the Grantham Research Institute/London School of Economics (LSE) in 2017 reveals how the European Central Bank's Corporate Sector Purchase Programme and the Bank of England's Corporate Bond Purchase Programme have been skewed to high carbon issuers and as a result cannot be considered market neutral.

The LSE's investigations revealed that:

- As of April 2017, the ECB had accumulated EUR75 billion worth of corporate bonds, yet 62.1% of ECB corporate bond purchases were from issuers in the manufacturing and electricity sectors; sectors which are responsible for 58.5% of Eurozone greenhouse gas emissions, but, only 18% of Gross Value Add (GVA)
- In terms of the Bank of England's Corporate Bond Purchase Programme, almost 50% of the Bank's purchases were from issuers in the manufacturing and electricity sectors, generating 52% of GHG emissions, but, providing just 11.8% of GVA

This opens up the discussion on how to grow the climate-aligned and green bond market as well as examining the carbon intensity of ECB (and other central bank) eligible securities. While the scale of QE programmes is being scaled back and withdrawn in certain countries, central banks could consider how QE programmes could specifically target green sectors/green bonds as well as going beyond their typical holdings of government bonds into other asset classes such as equities, as part of a broader diversification and return generation strategy.

Central banks and ESG- and climate-related risks and opportunities

Central bank leadership and the role of emerging markets

To date, the main areas of focus for central banks when it comes to ESG and climate change has been in encouraging disclosure among corporates and investors as it relates to climate risk and hence supporting the work of the Task Force for Climate-related Financial Disclosure (TCFD).

While there have been a few high profile sovereign wealth funds such as Norway's Norges Bank Investment Management, New Zealand's Superannuation Fund and Singapore's GIC integrating sustainability into their investment process, this activity has not occurred to any great degree across the central banking community.

As the largest holders of foreign exchange reserves, emerging market central banks have an important role to play when it comes to greening the financial system not least since emerging market countries are particularly exposed to extreme weather events and the accompanying financial stability risks.

China is an interesting example in this regard and the progress it has made since the establishment of its Green Finance Taskforce in 2014. Their recommendations were adopted by the Central Council in 2015 which translated into green financial guidelines in 2016, the same year China become the largest green bond issuer. China's focus has included measures to support factors boosting green products with the help of price incentives and raising the costs associated with polluting projects.

We find that many central banks, particularly in emerging markets, are also acting with other institutions to accelerate sustainable investment.

We suggest that central banks have a role in coordinating and encouraging other activities relevant to greening the financial systems. For instance, the Sustainable Insurance Forum (SIF) was formed to facilitate best practice exchange amongst twenty insurance regulators.

In terms of disclosure, many stock exchanges around the world are encouraging sustainability reporting. The aim is to improve corporate transparency, strengthen risk management and promote both stakeholder engagement and communication. Currently 38 exchanges around the world provide ESG guidance, with a further 10 committed to publish and the remaining 40 having currently no guidance intentions.

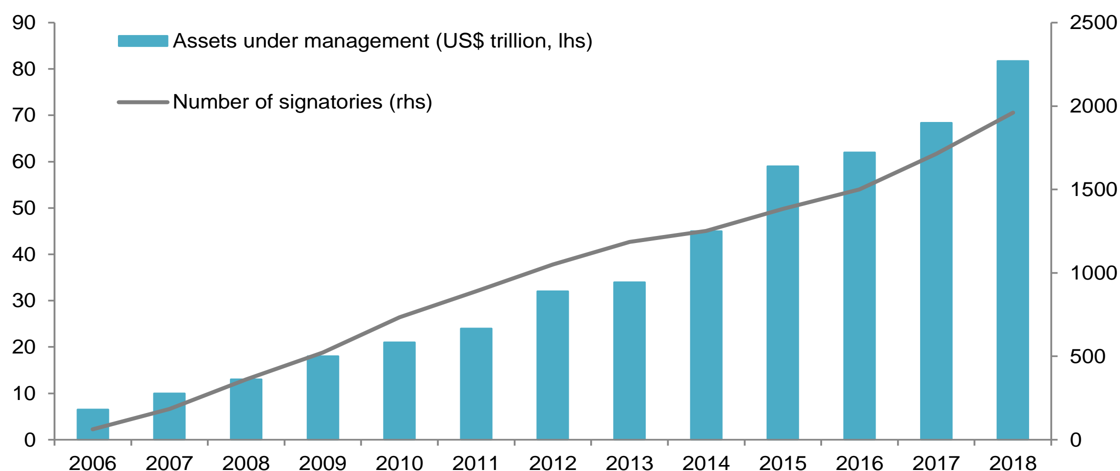
The World Federation of Exchanges (WFE) provides ESG recommendations and guidance for its members and they specifically recommend 34 key indicators that can be incorporated into stock exchange listing disclosures.

Adopting ESG best practise & filling the sustainable investment gap

Actions that central banks could consider

The increasing number of asset owner and asset manager signatories to the Principles for Responsible Investment reveals the growing acceptance that integrating ESG and sustainability into the investment process leads to better long-run financial performance. According to the PRI, assets managed in accordance with ESG criteria had reached USD81.7 trillion in 2018, Figure 5.

FIGURE 5. SIGNATORIES TO THE PRINCIPLES FOR RESPONSIBLE INVESTMENT BY NUMBER AND TOTAL ASSETS UNDER MANAGEMENT



Source: PRI (April 2018)

One of the key ways that central banks could accelerate responsible investing by:

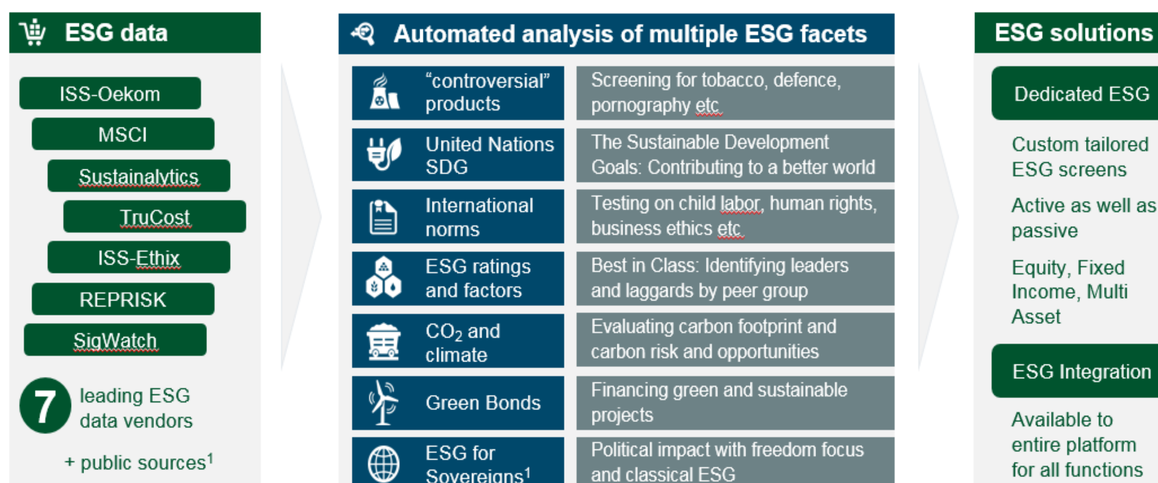
- becoming signatories to the PRI,
- encouraging asset managers to deepen their approach to responsible investing by prioritising reserve and pension fund management by managers with top credentials
- incorporating ESG expectations into investment management agreements, particularly around investee engagement
- creating an ESG specific portfolio or benchmark.

The PRI provides detailed guidance and assistance for creating a responsible investing strategy as well as ESG integration guidance across different asset classes.

Thanks to improved levels of transparency and the increasing breadth of reporting on extra-financial factors from companies, there has never been more data from which to assess ESG metrics. Indeed a number of specialised data vendors including Sustainalytics, Oekom and MSCI offer wide coverage across multiple ESG facets.

Leveraging these resources, DWS has built the ESG Engine, which combines data from seven specialist ESG providers alongside that from NGOs and other publicly available sources, Figure 6. The ESG Engine covers over 3,000 data fields, allowing sector and norms screening of more than 13,000 issuers in the developed and emerging world across listed equity and fixed income.

FIGURE 6. DWS' ESG ENGINE – BUILDING SOLUTIONS



Source: DWS (April 2018). For Illustrative Purposes Only

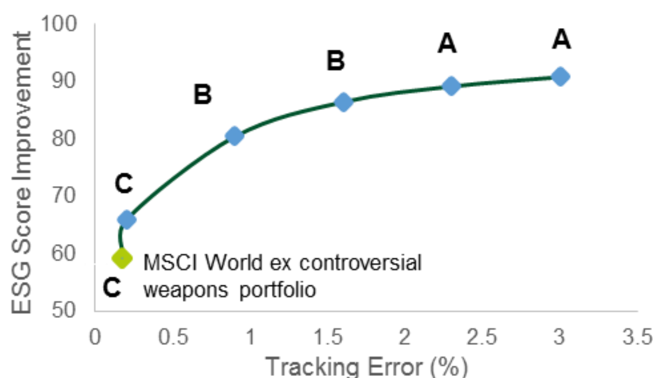
Such comprehensive coverage has allowed the development of our proprietary ESG rating system. This leverages the multiple information sources of the ESG Engine to take a 360 degree view of companies and sovereigns, and looks for consensus across the different ESG agency scores in order to build a more informed rating system. This rating approach can therefore be used to assess the ESG quality of an investment portfolio.

In addition, it also provides the ability to create bespoke investor strategies such as sector screens, norms based screens and sovereign screens. In terms of implementation approaches, these can range from exclusions, best-in-class or thematic. Both investment strategies and implementations approaches can also be standardized, customized or combined.

Other areas of work we have conducted using the ESG Engine include calculating ESG fund ratings, establishing minimum ESG standards and tracking ESG index performance relative to parent benchmarks.

Since so many decision variables exist when constructing an ESG portfolio, we can investigate the inherent trade-off between improving the ESG quality of a portfolio and the increased tracking error generated versus its benchmark. Our analysis, shown in Figure 7, reveals that relatively strong composite ESG scoring gains are possible for relatively limited increases in ex-ante tracking error. This is especially true when we consider that 0.18% of tracking error is introduced into a MSCI World solely by the controversial weapons exclusion. From here, we find that a 0.90% tracking error portfolio moves up our ESG rating grade from C to B, and a 2.30% tracking error portfolio moves up to a best-in-class A rating (DWS, July 2018).

FIGURE 7. IMPROVEMENT IN PORTFOLIO ESG SCORE COMPARED TO TRACKING ERROR TRADE-OFF



Source: Bloomberg, DWS (July 2018). Past performance is not indicative of future returns.

Building resilience to low-carbon transition risk and seizing green investment opportunities
Moving beyond measuring and improving the ESG quality of a portfolio, central banks could also measure the specific climate risks within their portfolios and from there build a more climate resilient investment approach. Thus far investors' approach to boosting climate resilience has typically involved measuring the carbon emissions of issuers in their investment portfolio. This carbon foot-printing exercise can be a starting point for assessing the transition risk of a portfolio however it fails to take into account all aspects of transition risk as well as the physical risks of climate change, such as sea level rise, droughts, flooding and cyclones. These, in our mind, pose a far more immediate threat to investment portfolios. A number of low-carbon transition risk assessment methodologies are emerging for investors.

Physical climate risk
To address physical climate risk, a number of data providers have started to map the physical locations of corporate facilities around the world alongside climate models. This allows data users to identify both the geographic exposure to climate hazards of individual companies, but, also the business sensitivity of facilities or companies to those hazards. In or view, this delivers powerful results.

For instance, such data can allow investors to more closely link an extreme weather event with financial performance. One example of the impact of an extreme weather event on portfolio performance can be seen in the extreme floods that occurred in Thailand in 2011. With a large number of industrial parks in the country under water, around a quarter of the world's hard drive production capacity was disrupted. This had significant financial impacts on the Korean electronics sector such that those companies with a higher concentration of their supply chain in Thailand posted a disproportionate decline in their share price.

Understanding the linkages between extreme weather events and financial market performance is a welcome development since it makes it possible to create new equity and credit indices that aim to better reflect the true risk to asset prices. This fills a major gap in the market when it comes to mapping physical climate risk and integrating these risks into the investment process. Indeed we are working to create investment products that reduce investors' exposure to companies with the highest physical and transition climate risks.

Like physical climate risk, data enhancements are also assisting in developing more sophisticated investment solutions such as carbon asset risk stress testing and climate scenario analysis. For example, the 2 Degrees Investing Initiative was commissioned by the California Insurance Commissioner and Swiss government to assess low-carbon transition risk in insurance and pension fund investment portfolios.

Green supporting factor, green asset backed securities & brown penalising factors
One of the approaches to establish and promote a green finance market in China has been through differentiating reserve and capital ratio requirements that reflect the carbon intensity of the activity being financed. In the developed world, the debate on a 'green supporting factor/brown penalising factor' in capital reserve requirements will likely continue for some time.

We think that the idea of a green supporting factor for green mortgages is interesting and logically compelling. European Bank regulators could help make the European Energy Efficient Mortgage Action Plan (EEMAP) pilot initiative a success by encouraging more mortgage banks to participate and existing participants to devote sufficient staff and oversight attention to engaging with the mortgage supply chain.

More banks could also be encouraged to start green tagging their loan book. EM central banks could assess creating similar pilot initiatives in their countries in combination with 'on-bill' energy efficient loan repayment mechanisms. Central bank support in this area could contribute to developing the evidence for assessing the merits of a green supporting factor and help build a green mortgage industry and green mortgage securities.

DWS' profile and capabilities

Enabling our clients to contribute to a sustainable future by incorporating environmental, social and governance factors into our global investment process across asset classes

DWS is one of the world's leading investment organizations, with EUR 687 billion of assets under management as of June 30, 2018. We offer individuals and institutions, traditional and alternative investment services across all major asset classes. DWS was listed on the Frankfurt Stock Exchange in March 2018, following Deutsche Bank's market floatation of the Deutsche Asset Management division and our re-branding to DWS.

Our track record in responsible and sustainable investing spans more than twenty years, dating back to our first participation in company annual meetings in Germany and the creation of our first impact investing fund in the area of micro-finance.

In February 2008, DWS became the 75th signatory to the PRI, which now has over 2,000 signatories. We were also one of the first major investors to publish thematic reports on climate change for our clients, starting in October 2007.

Over the past five years, and amongst the largest asset managers, we have the strongest track-record voting in favour of climate related AGM resolutions in the US[1]. For the past decade, DWS has consistently supported the annual letter from investors that calls on governments to strengthen their climate policies.

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[1] Ceres December 21, 2017

Important information – UK

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