

# Greening the Central Bank Balance Sheet – or Not?

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# Greening the Central Bank Balance Sheet – or Not?

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## **Abstract:**

Should central banks be favouring green assets in their large-scale asset purchase programmes? This question has caused an intense debate in the Euro area, and to a lesser extent the UK, focussed on the corporate bond purchases made by the European System of Central Banks and the Bank of England (BoE) (Weidmann, 2019; Cochrane, 2020; and Villeroy de Galhau, 2021). One thing is agreed – the bond portfolios of both institutions (as of mid-2021) support economic activity that is not consistent with the stated targets of the EU and the UK to hit net zero carbon emissions by 2050 (BoE, 2020; Ilzetki and Jia, 2020, citing Hassler et al, 2020).

The conflicting answers seem obvious and clear to each side in the debate. To summarise some complicated arguments briefly, there are those who believe that sustainability issues are not within the mandate or competency of the central bank and that the independence that is essential for monetary policy would be damaged by central banks exceeding their remit. On the other side, there are those who believe that sustainability issues are covered by existing mandates – at least as part of secondary objectives; that central banks, like all other institutions, can and must embrace sustainability issues if society is to deal with an existential threat and that action can be taken which does not impact on monetary policy. Both sides have good arguments to make which we explore in this paper.

The debate, however, has become centred around whether corporate bond purchases should be tilted in favour of ‘green’ assets, somehow defined, and away from ‘brown’ assets. In this paper we argue that:

- (a) Not only is it permissible for a central bank to be involved in climate mitigation activities, but their existing mandates require it.
- (b) The expansion of their balance sheets has given central banks the ability to act, without impacting adversely on monetary policy.
- (c) The debate should consider all assets, not just corporate bond portfolios.
- (d) Arrangements could be made to avoid central bank staff making detailed capital allocation decisions.
- (e) Future debate should centre constructively on what policy problems central bank operations can help to solve and which are effective.

The arguments for and against ‘greening’ the central bank balance sheet need to be carefully weighed on both sides. For example, buying large quantities of green assets could have perverse consequences for nascent green markets. On the other hand, a refusal to engage on climate change could be the more damaging choice for long-run independence.

## 1 Introduction

In recent years, a debate has emerged concerning the asset purchase programmes of the Eurosystem<sup>4</sup> and to a lesser extent the Bank of England (BoE) (Weidmann, 2019; Cochrane, 2020; and Villeroy de Galhau, 2021). To the extent that these asset purchase programmes bought corporate bonds, it can be said that they are supporting economic activity which is not yet consistent with the 2050 net zero carbon emissions targets of the European Union (EU) and the United Kingdom (UK) (BoE, 2020; Ilzetzki and Jia, 2020, citing Hassler et al, 2020). These objectives were borne out of the agreements made at the 21<sup>st</sup> Conference of the Parties in Paris, 2015, – often referred to as ‘the Paris Agreement’ or COP21 (United Nations, 2015) – to limit global warming to no more than +2<sup>o</sup>C compared with pre-industrial levels<sup>5</sup>, with an ambition of limiting it to no more than 1.5<sup>o</sup>C by the end of the 21<sup>st</sup> Century.

The BoE acknowledged this divergence publicly (BoE, 2020) when it became the first central bank to make disclosures consistent with the recommendations of the G20 Taskforce on Climate-related Financial Disclosures (TCFD, 2017). In its second climate-related disclosures published in June 2021, the BoE report states that, as a central estimate, the corporate bond portfolio is consistent with an average temperature increase of 3.0<sup>o</sup>C above pre-industrial levels by the end of the century.<sup>6</sup> Broadly similar calculations have been made for the Eurosystem portfolio (Matikainen et al, 2017) and it has been asserted (Ferrari and Landi, 2020) that greening asset purchases would only help at the margin as *‘climate change and pollution are structural problems, while a temporary Green QE is an instrument that plays a role along the business-cycle as other monetary policy tools’*.

Should the ECB and BoE change the composition of these portfolios to be consistent with their governments’ 2050 net-zero objectives? Arguments have been made strongly in favour and against, especially in connection with the ECB. The BoE has already announced that it intends to take action to change its portfolio to be more transition consistent (BoE, 2021b). In the case of the ECB, it has already started to take into account climate change risks in relation to its corporate sector monetary policy portfolios (ECB, 2021a), while in February 2021 a common stance across Eurosystem national central banks and ECB for climate change-related sustainable investments in non-monetary policy portfolios was reached (ECB, 2021b). In what follows we succinctly paraphrase the arguments for and against these compositional changes, whilst attempting to be fair to the protagonists.

### 1.1 Arguments against:

Some central bankers, including the former Reserve Bank of India Governor (Reuters, 2021) and some associated directly with the ECB (Weidmann, 2020), have argued that climate change is not a policy matter for the central bank to address. The Eurosystem corporate bond portfolio has been acquired simply as a consequence of the ECB pursuing its monetary policy mandate, as set out in the

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<sup>4</sup> For the balance sheet of the Euro area, we refer to the Eurosystem rather than to the European Central Bank (ECB), which is only part of the system or the European System of Central Banks (ESCB) which includes some non-euro countries. However, monetary policy decisions are taken at ECB level and hence we interchange appropriately throughout the paper.

<sup>5</sup> In the details of the Paris Agreement, ‘pre-industrial’ temperature is defined as the average over the period 1850 -1900 AD.

<sup>6</sup> This is a slight downwards revision compared with the BoE’s 2020 disclosure, which estimated CBPS portfolio alignment of 3.5<sup>o</sup>C. See BoE (2021a) for a discussion of the factors behind this revision.

Treaty on the Functioning of the European Union (TFEU), which it is legally required to observe. It can be argued that to take climate change matters into account would mean the ECB would be operating outside of that mandate. Given the already powerful mandates of unelected central bank officials, it would be undemocratic and dangerous to stretch them further: the independence of the ECB is crucial to its achievement of monetary policy and disregarding its mandate would bring that independence into question. The ECB's bond purchases were designed to 'buy the market'. It is not the central bank's role to allocate capital between competing firms and market neutrality is necessary to preserve that degree of distance and to avoid unintended economic distortions.

We should note that other, more subtle arguments could also be used – for example, that proposed greening actions might have perverse consequences in discouraging the growth of markets for green assets. But such arguments are not usually advanced, perhaps because they do not fit easily within the overall stance of climate change being *ultra vires*. This paper is not so constrained and so those arguments are considered later.

## 1.2 Arguments in favour:

The counter arguments against the status quo can be made at different levels and various protagonists may be found using the following arguments:

- i) **Everyone must play their part:** It can be argued that climate change is an existential threat to human existence (e.g., UN, 2018; Guterres, 2018). It is a moral/social/ethical issue to bequeath a habitable planet to our descendants. In October 2018 the Intergovernmental Panel on Climate Change (IPCC, 2018) issued a special report on the impacts of global warming of 1.5°C, finding that limiting global warming to 1.5°C would require rapid, far-reaching, and unprecedented changes in all aspects of society. Three years later, the IPCC's report on the physical science (IPCC, 2021) described climate change as being 'widespread, rapid and intensifying' and was reported as a 'code red for humanity' by the UN Secretary General (United Nations, 2021). It can be asserted that it is imperative for all actors in society to do whatever they can to mitigate (and adapt to) climate change.
- ii) **Secondary objectives:** Central banks have a wide range of responsibilities. These vary according to jurisdiction, but they may include: monetary policy, banknote issuance, financial stability, prudential supervision for different financial sectors but usually banks and payment systems. But around half the world's central banks also have secondary objectives which generally require them to support the government's broader economic policies (Dickau and Volz, 2019). Where climate change mitigation and adaptation are part of those broader policies, such central banks have a duty to support that policy. Both the ECB and the BoE have a general secondary objective. In 2021, the UK Government included climate change explicitly in its guidance and remit letters to the BoE's policy committees, to clarify that they were covered by the BoE's secondary objective<sup>7</sup> (BoE, 2021c).

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<sup>7</sup> We understand that this was by mutual agreement – BoE considered it helpful to have the explicit cover to support its actions in this area.

- iii) **Primary objectives:** Climate change has significant, pervasive effects which impact on all of the primary objectives of a central bank (Fisher and Alexander, 2020). Therefore, they have no choice but to take it into account. Most of the policy action to date has been in relation to prudential regulation and supervision, but climate shocks, both physical events and the transition to a low-carbon economy, are a threat to both monetary and financial stability.
- iv) **Independence:** The most likely consequence of inaction is that central bank mandates will be changed to not only permit, but to require climate action. But once a mandate is re-opened, all sorts of other politically motivated changes might be proposed. The hard-won independence of central banks – essential for monetary policy - may be best preserved by realising that they need to take climate action, rather than by rejecting it.

The first of these arguments has objective merit but is unlikely to sway someone who takes the opposite view: they can argue that action on climate change is a government responsibility, not that of a central bank. There is also objective merit in that position. This may reflect a wider collective action and/or a free rider problem; that individuals feel it is not their responsibility, that their own decisions have little impact and/or that it would be better for others to incur the cost of taking action.

The second argument should be powerful, but secondary objectives are most frequently ignored by the governments that set them, by the agencies to whom they apply, and by commentators. Until very recently, the ESCB/ECB seemed to seldom, if ever, refer to their secondary objective, stated in the TFEU:

*‘Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union.’*

Rather than appeal to this part of the TFEU, the ECB has historically seemed to interpret all of its actions as being justified by monetary policy (ECB, 2018; IMF 2018). To do so, it simply describes all the issues it wants to address as affecting monetary conditions or the transmission mechanism of monetary policy.<sup>8</sup>

The third argument seems to be on firmer ground and there is some evidence of the ECB accepting this (Cœuré, 2018; ECB, 2021c). But given that the validity of some of the ECB’s actions have been challenged in the courts, it seems likely that it will continue to couch its communications in terms of monetary policy. This is unfortunate because many of the issues that need to be addressed by central banks are not primarily related to monetary policy, including the subject of this paper.

Part of the discussion around mandates may reflect a subtle distinction between the common law system of the UK (and the US) and the civil law system of (continental) Europe (see e.g., World Bank, 2021 for a distinction). Broadly speaking, the UK authorities must act in accordance with their mandates, but everything is permitted that is not expressly prohibited by law although that includes prohibition by precedent and sometimes by convention. European law is generally more

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<sup>8</sup> For example, the ECB’s Securities Markets Program announced in response to the Global Financial Crisis was designed to ensure depth and liquidity in certain dysfunctional peripheral sovereign markets and help restore monetary policy transmission (see ECB, 2010).

prescriptive. Broadly speaking, actions must be explicitly permitted for the authorities to be able to undertake them. So, it could be argued that there is nothing to prevent the BoE taking climate change into account, and nothing specific which allows the ECB to.

In Section 2 of this paper, we briefly consider the role of the central bank balance sheet and how it supports a central bank's policy objectives. Section 3, we then review recent balance sheet developments in the UK and the Euro area whilst Section 4 reviews many of the arguments which have been advanced so far concerning the greening of the balance sheet. Section 5 looks at what may happen in future, given regulatory developments. Section 6 addresses issues which we consider to be more substantive and considers possible policy options that could be considered. Section 7 concludes.

## **2 The importance of the central bank balance sheet**

### *2.1 Why is the central bank balance sheet important?*

The balance sheet of the central bank is its defining feature, and its core responsibilities are those which depend on its use: monetary policy, physical currency issuance, Lender of Last Resort (LoLR), and the safeguarding of payments systems. Many of the other responsibilities sometimes associated with a central bank - financial stability or prudential supervision for example – are performed by other institutions in different jurisdictions. For example, the Monetary Authority of Singapore has wide-ranging responsibilities including for both prudential supervision and financial conduct, whereas the Swiss National Bank has neither.

Those core responsibilities which are common relate to the central bank as the sole issuer of domestic currency. It can thereby control the size of the domestic monetary base (the narrow money supply) as defined by currency in circulation<sup>9</sup> and commercial banks' reserve balances held at the central bank. These are usually the dominant components of a central bank's liabilities. In controlling the supply of this base money, the central bank can set its price, a short-term interest rate. Across jurisdictions, that control enables the central bank to set monetary policy: usually by targeting a nominal anchor: the inflation rate itself, monetary aggregates, or the exchange rate.

Given its balance sheet, the central bank can also act as LoLR to the banking system on a system-wide basis, or an individual firm and can play a central role in wholesale/systemic payments systems such as maintaining Real-Time Gross Settlement systems across their accounts. Other responsibilities, such as for financial stability or prudential supervision, are sometimes given to the central bank because of synergies, but can be assigned elsewhere.

Prior to the GFC, banknotes would have been the larger part of base money in many developed country jurisdictions (including the US, Europe, and the UK), with banknote growth being largely

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<sup>9</sup> Central banks are almost universally responsible for note issuance, but not always coins. But by value, coins are not significant and are not considered in what follows.

determined by public demand. Commercial bank reserves were usually kept at relatively low levels to facilitate payments between banks or as required reserves for prudential reasons.

The level of the base money supply is usually chosen by the central bank to be consistent with their chosen policy interest rate. The process involves the central bank buying assets or lending to the banking system in sufficient scale to inject the required amount of commercial bank reserves. In major oil exporting countries, the process works in reverse: the central bank is obliged to translate foreign currency revenues into domestic currency which leads to excess creation of reserves. The central bank then has to drain liquidity using term deposits or monetary bills in order to be consistent with the chosen policy rate. Many of these countries also choose to maintain a fixed exchange rate.

In contrast, since the GFC, with desired and actual interest rates close to zero, alongside sluggish growth and low inflation, many developed country central banks have focussed on deliberate base money expansion to guard against deflation and hence support growth. This has been labelled as Quantitative Easing (QE), Credit Easing or simply Large-Scale Asset Purchases (LSAPs).

## 2.2 *What is Monetary Policy?*

*In what follows it is useful to be clear about the definition of certain terms. In this paper we use the following:*

*Monetary policy* is generally the act of adjusting a policy instrument in order to target a *nominal anchor* such as inflation, the exchange rate or a monetary aggregate. The *instruments* include: the supply of narrow money, setting a short-term risk-free interest rate, or direct intervention in foreign exchange markets (i.e., supplying base money and acquiring foreign currency or vice versa). We also count official announcements as part of the toolkit of instruments. We distinguish these monetary policy actions from intended outcomes. Also, we distinguish them from intermediate targets such as suppressing/boosting the yield curve or market spreads.

*Monetary conditions* are adjusted, through the use of monetary policy instruments, such as the interest rates on reserves, open market operations (e.g., lending operations and asset purchases), and forward guidance. These instruments involve direct market engagement, usually subject to some transparent rules governing purchasing operations, loans etc. (But may include a communication strategy).

The impact of monetary policy is transmitted to the real economy by many channels: expectations and announcement effects, market interest rates, the exchange rate, inter-temporal substitution between consumption and saving or investment, income and wealth effects via asset prices and debt stocks etc. Collectively we refer to these channels as *the monetary transmission mechanism* (MTM).

The degree of stability of the value of the currency, as evidenced by the stability of the general price level, the exchange rate and/or stability of financial markets, can be usefully labelled as *monetary conditions*.

Hence monetary policy decisions are transmitted to the real economy via the central bank's monetary policy instruments so as to influence monetary conditions via the monetary transmission mechanism.

Monetary policy decisions, instruments, and operations so defined are under the direct control of the central bank. But monetary conditions and the transmission mechanism are directly impacted by many other structural factors, shocks and/or policies, not just central bank actions. In this paper we therefore define monetary policy narrowly as the direct control of the level of the base money supply, or as the price of money (as captured by the policy-determined interest rate).

Other policies undertaken by the central banks – LoLR for example - may also involve balance sheet operations. In doing so they may take the form of a monetary operation or changes to the parameters of a monetary operation; they may impact on the transmission mechanism or impact on monetary conditions. But we should not strictly consider those to be monetary policy actions unless they are designed to affect the interest rate or the base money supply (or the exchange rate in a targeting regime). That is because any policy action by any authority which impacts on the macroeconomy also affects monetary conditions and potentially the transmission mechanism, even if the decision has nothing to do with monetary policy. It does not make sense to define monetary policy to include, say, policies pursued by the Labour Ministry. In practice, LoLR can increase base money at the margin, but a central bank has the ability to take countermeasures (e.g., by reducing its lending elsewhere or by selling assets) and so can choose whether or not to sterilise the impact.<sup>10</sup>

If a policy does not directly affect the level of the base money supply and does not involve a change in the central bank policy rate, then it is not a monetary policy action for the purposes of the analysis presented in this paper.

Of course, central banks can and do undertake policies designed to affect the workings of markets and specifically the monetary transmission mechanism. That may be entirely justified by the monetary policy mandate. But such actions may alternatively be justified by financial stability, or by the central bank's secondary objectives and we wish to distinguish between these options.

Equally, just because a central bank action for non-monetary reasons has an impact on monetary conditions or the workings of financial markets, we should not consider that to be in some way counter to its monetary policy objective. There are many shocks to the economy on a continuous basis, from a wide variety of sources, and the job of the monetary authority is to take all such influences into account and then set the money supply and/or interest rate to target its monetary objective. For example, it may well be that a decision to implement LoLR or not has an impact on the optimal setting of monetary policy and will directly affect the money supply. But that sort of spill over should not be considered a conflict as long as monetary policy instruments can be altered appropriately to ensure the monetary objective remains achieved.

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<sup>10</sup> When the newly created liquidity is absorbed, the reserves are still there, they just go from current account/deposit facility at the central bank, to a term deposit, but the point is that the central bank's ability to keep firm control over short-term interest rates is not impacted.

This distinction is not uncontroversial. But if we don't define monetary policy in this narrow fashion, any central bank action can be interpreted as a monetary policy action and that is not helpful if the central bank has multiple objectives. Consider the following specific example:

Suppose that a central bank makes a change to its collateral policy so as to reject certain collateral it previously allowed, or even increase the haircuts applied to that collateral. That might be justified simply on risk management grounds such as increased actual or perceived credit risk associated with that collateral type, or perhaps for financial stability reasons to discourage the use of certain financial instruments. But such a change to the collateral set, which undoubtedly represents a change to monetary operations, does not in itself affect the base money supply, nor the interest rate, though it may have some (probably minor) effects on the transmission mechanism or on monetary conditions (e.g., through the provision of liquidity secured on this collateral or market spreads). In general, although the taking of collateral is an important part of monetary operations, we would not classify alterations to the collateral set as representing a monetary policy action unless the changes are required in order to set the policy interest rate or the money supply.

### **3 Summary of recent balance sheet developments**

The BoE and Eurosystem both embarked on large-scale asset purchase programmes following the Great Financial Crisis of 2007-9. To set the context, this Section describes these programmes in summary form.

The BoE's asset purchase programme was initially almost entirely composed of conventional UK government bonds (gilts) and was designed simply to inject a large quantity of (sterling) base money into the UK economy. Hence it was labelled Quantitative Easing (QE) and after several renewed rounds by end March 2021 it had reached a total of £794bn (over 40% of annual nominal GDP) of which some £774bn was UK government securities (gilts). Smaller portfolios of commercial paper (under £3bn) and corporate bonds (under £2bn) were bought during 2009-10 but the commercial paper was allowed to mature, and the bonds bought at that time were sold back to the market as part of a 'Market Maker of Last Resort' (MMLR) approach (see Fisher, 2010). In 2016, in view of the risks associated with the UK's exit from the European Union (EU) and alongside a general QE expansion, the BoE began a larger sustained programme of corporate bond purchases. This was increased in response to the 2020 Pandemic and reached some £20bn by mid-June 2021.

In response to the European sovereign debt crisis, high insolvency risks of the banking sector and impairment to the transmission of monetary policy, the ECB undertook to support European markets initially through its first covered bond program and soon after through its securities markets program, the latter focused on improving liquidity in certain peripheral sovereign markets.<sup>11</sup> As strains intensified and specifically in response to increased risk of the fragmentation of the euro area and resulting redenomination risk, in August 2012 the ECB announced its Outright Monetary

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<sup>11</sup> This covered bond program achieved multiple objectives, namely, '(a) promoting the ongoing decline in money market term rates; (b) easing funding conditions for credit institutions and enterprises, c) encouraging credit institutions to maintain and expand their lending to clients; and (d) improving market liquidity in important segments of the private debt securities market' ECB (2010).

Transactions program which involved the potential to purchase sovereign securities but only from those countries that had applied for official financial support. By 2014, and as part of its accommodative monetary policy stance, the ECB had announced a package of further purchase programs (so-called Eurosystem asset purchase programme or ‘APP’), eventually involving purchases of public sector securities, covered bonds (a third such program), corporate bonds, commercial paper and asset backed securities. When net APP purchases concluded in December 2018, public sector securities accounted for 82% of the total net purchases (ECB, 2019a). In March 2020 and in response to Covid-19, the ECB re-started its net securities purchases and holdings of corporate bonds under all ECB programs had reached €307bn by May 2021. At the same time, according to the ECB’s website, the majority of the ECB’s purchases continued to be from public sector issuers and at end-May 2021, the ECB’s total portfolio of public sector purchases stood at €3,793 bn (or 33.6% of GDP).

**Table 1 Large-scale asset purchases: stocks**

		<b>Nominal value</b>	<b>As a % of balance sheet</b>	<b>As % of Annual nominal GDP</b>
<b>Corporate bonds</b>	<b>Bank of England</b>	£20bn	2%	1.0%
	<b>Eurosystem</b>	€307bn	4%	2.7%
<b>Other asset purchases</b>	<b>Bank of England</b>	£774bn	82%	39.5%
	<b>Eurosystem</b>	€3,793bn	49.5%	33.6%

Source: Bank of England and European Central Bank.

Note: Bank of England asset purchase data as at end-March 2021 (BoE, 2021d) based on initial purchase price, less redemptions. Whole balance sheet data from end-February 2021. BoE: £940bn.

European Central Bank data as at end-May 2021. Eurosystem asset purchase figures are at amortised cost and at month-end. Balance sheet: €7,658bn

GDP data: annual nominal GDP, 2020. UK £1.96trn. Euro area: €11.3trn. Source: UK and EU statistical authorities.

## **4 Consideration of previous discussions in relation to greening the balance sheet**

### *4.1 Corporate bond portfolios*

To date, the discussions around greening central bank balance sheets have largely focussed on the monetary policy related corporate bond portfolios, even though these are not a big share of the respective central bank balance sheets – just 2% in the BoE case and roughly 4% for the ECB. (Table 1). In this Section we run through some of the popular arguments for and against ‘greening’ these specific portfolios. In the following section we consider some broader issues which might be more impactful.

We take as our ‘straw man’ the proposal that corporate bond purchases be ‘tilted’ in favour of those firms or sectors with lower carbon emissions and away from those with higher – as proposed in BoE (2021b), which has been issued as a consultation paper.<sup>12</sup> The considerations of how to do this are laid out by the BoE:

- Does one include the ‘Scope 3 emissions’ which are those caused by the supply chain to a firm and/or by the use of a product by its consumers? An automobile manufacturer producing petrol or diesel cars might have low emissions in its manufacturing plants (Scope 1) and buy in energy from renewable sources (Scope 2), but the products when used (Scope 3) will be highly polluting. In general, Scope 1 and 2 emissions estimates are much more readily available and accurate than Scope 3.
- Does one treat equally, those firms which are investing to reduce their carbon emissions and those who are not? How can one obtain reliable information on that?
- Does one exclude firms altogether when their business model is inconsistent with government policy targets? For example, coal-related sectors.

The precise methods chosen by central banks are important, as they may help set market standards. But some complex policy questions are raised:

- i) **Is such ‘tilting’ covered by the Central Bank’s mandate?** We have discussed this proposition in Section 1, and it seems to depend to some extent on an interpretation of secondary objectives. A conservative view of ECB operations would be to say that if it cannot be justified as monetary policy – and it probably could not, even taking the ECB’s broad definition – then it is not allowed under the TFEU. That view seems contestable at least, given the ESCB’s secondary objective as stated in the Treaty.

Does such ‘tilting’ involve the central bank taking on too many objectives? Is it a misuse of unelected power which threatens precious central bank independence? On the contrary, as rehearsed in Section 1, it could also be argued that it is a misuse of the mandate to ignore something which has such obvious potential to disrupt the central bank’s primary objectives. Whichever way one wants to interpret the TFEU, if there is a consistent social and political demand for action to address climate change and the ECB does not respond, it could ultimately find an unwanted and inappropriate formal remit change being given to it. Part of the problem here is that it is hard to change an international treaty in an evolutionary way and that, once reopened, the consequences are unpredictable.

It is worth noting that this is not a purely academic question: the EU has already taken the step of changing the mandates of other EU regulatory bodies: the EBA, EIOPA and ESMA have all had their mandates changed to specifically give them a duty to take into account the EU’s policies on sustainable finance. But if a new Treaty has to be agreed to change the mandate for the ECB&ESCB then it could open up the possibility of broader, unwanted changes.

- ii) **What is the central bank objective in taking this action?** Central banks do not undertake policy actions because they can, or because they might be popular: they do so for a particular purpose. The stated purpose for ‘tilting’ could be to align the central bank balance

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<sup>12</sup> The Sveriges Riksbank announced that, commencing in January 2021, it would only purchase corporate bonds issued by companies deemed to comply with international standards and norms for sustainability (Sveriges Riksbank, 2020).

sheet with transition to net zero but our main observation at this stage, is that in proposing any particular outcome, the intended purpose should be transparent so that it can be understood, and its success can be judged. In general, one can assert that policy interventions by the authorities in financial markets are likely to be more effective if they are understood by market participants: Assuming that the policy has credibility, markets are likely to reflect the intent in pricing decisions and so help ensure the desired outcome.

iii) **Market neutrality.** The Eurosystem's purchases were consciously designed to be market neutral so that the central bank was not allocating capital between firms (ECB, 2021d). But there is nothing in the TFEU which requires such market neutrality, and this policy is certainly not inconsistent with the provisions in EU legislation around proportionality. The Sveriges Riksbank now takes sustainability considerations into account when purchasing corporate bonds, but the choice of bonds will also aim to avoid any distorting impact in those markets (Sveriges Riksbank, 2020). The Bank of Japan advocates flexibility in the interpretation of market neutrality by posing the question that, if private sector investment or loans are decided without taking into account the "*negative externalities*" caused by greenhouse gases, does this not affect the neutrality of resource allocation? (Kuroda, 2021). Possibly recognising the constraints this policy may bring, the ECB is now beginning to talk more in terms of 'market efficiency' as opposed 'market neutrality' (ECB, 2021e).

iv) **Effectiveness.** It is not clear how effective a policy of tilting purchases would be. This reflects the general arguments about disinvestment as a strategy. Such tilting should positively impact the firm's cost of funding when it goes to market with new debt or when it refinances existing debt. But Ferrari and Landi (2020), show that in the case of the ECB such a strategy is likely to have limited impact on the stock of pollution. Once a bond has been issued, the issuer has received the finance and that cannot be undone unless some specific covenants in the bond are triggered. All one can change is who the beneficial holder is: passing bonds from a holder that cares about climate change, to one who cares less, would not seem to achieve much. Indeed, it could be perverse, if it means the holder has less ability or willingness to put pressure on a firm to decarbonise.

The proposition must be that by changing the pattern of demand for the bonds, that would change relative market prices and hence the cost for new bond issuance. This seems to be a somewhat blunt approach and is unproven. It would certainly require a general move in the market to have much impact. In the relevant BoE experience the evidence was not very supportive. The corporate bond portfolio it bought in 2009-10 excluded any bonds which had embedded optionality. But the spreads of the excluded bonds, far from widening in relative terms, actually narrowed faster than the included bonds<sup>13</sup>. It is not clear why, but it may be that because the central bank was taking bonds out of the market, and asset managers had to hold something, that drove market demand towards the bonds that remained available for purchase. Or perhaps there was an expectation that the BoE would at some point in the future purchase the excluded securities. Either way, it seems impossible to rule out this kind of perverse response.

v) **Leadership.** It can be argued that where central banks lead, others will follow. The central bank can effectively set market standards through its own actions and act as a 'catalyst'

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<sup>13</sup> This was not well recorded at the time, but Fisher was the Executive Director of Markets at BoE from February 2009 for a five-year period, and this phenomenon was observed and tracked in internal reports.

(ECB, 2021d).<sup>14</sup> Since a proportion of the market has already begun to disinvest or to prefer green assets, it may be possible to generate market momentum which would ensure a bigger impact.

- vi) **The use of a policy portfolio.** The corporate bonds portfolios have been acquired for policy purposes. At some point, central banks may well unwind all or some of their QE portfolios. In the case of the BoE the corporate bond portfolio is already relatively small and could be sold quickly. However, one does have to guard against the risk that a sudden sell-off of green assets would be market negative. That risk can be mitigated. It would be possible for a central bank to maintain a portfolio of assets for a non-monetary purpose, as long as it also undertook sufficiently effective draining operations. We have a demonstration of this in how the large oil-exporting central banks work. We would not advocate this as a long-term solution, as draining tools are not always easy to implement and control, but they could be used to avoid the worst cliff-edge effects of unwinding such a green asset portfolio.

In summary, as a practical matter, the corporate bond portfolios could be ‘tilted’ in some fashion, and the Riksbank has already started to do so, although the direct market impact may not be significant.

In relation to the debate about mandates, there is increasing recognition, particularly on the part of the ECB, that *“independence requires a central bank to respond to the concerns of the public and to carefully evaluate whether and how it may be able, within its mandate, to respond to these concerns”* (ECB, 2021c). However, tilting the bond portfolio is clearly not a monetary policy operation: it would have no impact on the level of base money or the policy rate. It would hardly even seem to affect monetary conditions or the transmission mechanism, albeit a relative increase in the cost of funding for ‘brown’ firms (however defined) would be expected. In consequence, the ECB will be criticised by some if it does and by others if it doesn’t. That problem is not one of the ECB’s own making: the underlying problem is that the ECB is constrained by a fixed TFEU. It is not clear to everyone how its secondary objective should be pursued, and there does not seem to be any public dialogue between the EU governments and the ECB which could guide it. In contrast, the BoE secondary objective has already been clarified to include climate change considerations as part of government policy.

## 4.2 Other ‘greening’ issues to date

### (a) Collateral and lending operations

Beyond the corporate bond debate some other monetary operation matters have been openly discussed which we briefly consider. Namely, should central banks change their collateral policy – eligibility or haircuts – to favour green assets over brown assets? This question is a reasonable one to pose in abstract but is largely irrelevant in terms of market impact.

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<sup>14</sup> The ECB sees itself as having a ‘catalyst’ function in certain private markets and has, in recent years, given its support to loan level data reporting initiative for securitizations, and market initiatives aimed at having transparency, standardization and simplicity labels for securitizations, short-term commercial paper, and covered bonds (ECB, 2013).

A central bank requires collateral as a means of protecting its balance sheet from credit risks associated with lending to eligible counterparties. Lending money to banks on an unsecured basis would put public funds at risk and can complicate an emergency assistance or resolution event. Collateral availability therefore acts as a natural limit on the amount of lending a central bank can provide.

For most commercial banks their largest asset classes would be mortgage or corporate lending portfolios. Securities will be held for a range of reasons: in central treasury portfolios, including regulatory-required liquid assets; for market-making purposes; derivative hedging; or directly for use as collateral. But in general, corporate bonds would not make up a large part of a commercial bank's balance sheet – being subject to relatively high market and credit risk. Corporate bonds are more likely to be held by longer-term investors such as asset managers, pension funds and insurance companies.

Overall, one would not expect the impact of collateral changes by the central bank to be significant. Reflecting the use of QE to inject large quantities of base money, only a few, likely distressed banks with limited market access would need to borrow liquidity from the central bank under current market conditions. And if a bilateral LOLR operation was needed to maintain financial stability and therefore prevent the failure of a counterparty, it is unlikely that considerations of carbon emissions would prevent central bank support being offered.

Market-wide lending operations for liquidity injection purposes, are currently close to zero in both the Euro area and the UK. The main lending activity by both ESCB and BoE is being undertaken through targeted longer-term funding operations. While this is significant, making up roughly one third of the ECB's balance sheet in Q2 2021, the operations are structured to reduce funding costs and so incentivise lending to the real economy, as opposed to meeting the immediate liquidity demands of banks. Perhaps when taxonomies are more fully developed, the greenness of the lending being funded by these operations – and the associated collateral - can be taken into account and could be more 'funding for *green* lending' than just 'funding for lending' operations. The challenge with such operations is that bank funding is not hypothecated – subsidised central bank funding for green lending would free up market funding for brown 'lending' and so the funding would need to be tied to reducing the latter, not just increasing the former.

Overall, there seems to be no shortage of eligible collateral. Excluding certain instruments from the collateral set could affect their price at the margin but it seems unlikely that the commercial banks would hold particular assets solely because they could be used as collateral at the central bank. Given the current excess liquidity conditions, it seems unlikely that collateral changes can have much impact.

Nevertheless, market conditions change, so current conditions need not prevent a central bank giving some early thought as to how it would address the issues if the surplus liquidity and collateral position of the system was to change.<sup>15</sup>

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<sup>15</sup> For example, despite the high level of excess reserves at the moment due to its crises related responses, the ECB ultimately operates under a liquidity deficit regime and may choose to revert to this framework, at some point in the future (as difficult as this may be to achieve). In such a scenario, excluding carbon-heavy bonds from eligibility could have a semi-permanent effect on financing costs for issuers of such bonds.

### *(b) Haircuts*

It has been proposed that central banks should apply higher haircuts to high-carbon assets (Schoenmaker, 2019). To assess this proposal, one needs to understand the purpose of haircuts.

Risks associated with collateral only become important once a default has occurred and collateral is possessed at that point to settle an outstanding obligation. This is a rare occurrence and in such a situation, the risks include liquidity, market, valuation, and concentration risks.

Haircuts are designed to ensure that public money is secure in such an event, by ensuring that sufficient excess collateral is at hand to meet any outstanding obligations. It would be inappropriate to reduce haircuts for capital allocation reasons pertaining to wider objectives if that undermined their risk mitigation purpose. Increasing haircuts for non-risk reasons is easier to justify than reducing them, but also likely to be ineffective. Higher haircuts simply mean that more collateral has to be supplied in order to get a particular quantum of cash liquidity. Outside a default event, commercial banks should have a surfeit of collateral available (particularly in the case of loan collateral) that they can offer a central bank. In such circumstances the (opportunity) cost of meeting a higher haircut may well be zero. The only time when higher haircuts are likely to be a binding constraint is under a liquidity stress. In that circumstance, having higher haircuts to reflect other policy aims would not be attractive from a policy perspective.

Nevertheless, there are climate-related risks in collateral which may not be revealed in credit ratings. While efforts have been made by some central banks post-GFC to rely less on rating agencies to assess risks, some reliance on these external assessments continues. From a climate perspective, this creates potential risks as it is not currently clear how credit rating agencies factor climate risks into their overall ratings (ECB, 2021a).

### *(c) Limits*

Consideration could be given to measures such as restricting collateral holdings per operation by their sustainability characteristics, possibly allowing/requiring a greater proportion of green assets in longer-term operations and reserving the ability to use more brown assets in short-term/backstop operations such as overnight facilities, subject to limits (CEP, 2020), but such measures are crude and are also risky given that green bond markets are in their infancy and green assets generally have low availability. In the end, given that recourse to liquidity-supplying operations is likely to remain low, any such tweaks to collateral framework or haircuts are unlikely to make a significant difference for a considerable time.

### *(d) Pricing*

If borrowing in domestic currency from the central bank was to pick up going forward, a less crude approach could be for the central bank to charge different rates for lending against greener assets, than so-called brown or red assets. Clearly, for any operation that differentiates between assets, a taxonomy would be needed to define the relevant asset classes and strong efforts are underway to establish these definitions, most noticeably by the EU Commission. In the recent past, some central banks have structured their operations to widen the collateral pool but simultaneously incentivise the holdings of higher quality assets (HQLA) in the market, either by applying charge on the basis of

the type of collateral presented (Bank of England) or by introducing facilities to help banks meet prudential (HQLA) requirements (Reserve Bank of Australia and the Reserve Bank of South Africa). Such an approach could be adapted to support the transition to lower carbon collateral holdings, where relying on taxonomies, a different rate could be charged when ‘brown’ collateral is presented to the central bank. This rate would ideally be determined by an auction mechanism so that the true cost of holding ‘brown assets’ is discovered.

The arguments here are not dissimilar to those underlying the corporate bond portfolio – the conceptual difference between an outright purchase and a repo is not that significant. Of course, central banks should make sure that they can accept green assets as collateral; there is no reason not to include green bonds if they are available and offered and meet the central bank’s general collateral requirements. But to be effective, the central bank would need to try to take the market with it by establishing new norms for (reverse) repos of green assets.

Although these debates about operations clearly matter – certainly to the ECB – there is a risk that they are obscuring some more fundamental issues around central bank balance sheets, which may be more important to the ‘greening’ debate. We now turn to those considerations.

## **5 The future of central bank balance sheets**

Its balance sheet is what defines a central bank: it is the monopoly supplier of domestic base money which constitutes its main liabilities. The balance sheet should be seen as the most important policy lever of any central bank: as discussed earlier, it facilitates the conduct of policy operations such as setting interest rates or enabling LoLR.

Some central banks – such as most of the Gulf oil-producing states, or trading hubs such as Hong Kong and Singapore, have for many years had large balance sheets on which they hold large quantities of foreign exchange reserves, often in support of a pegged or heavily managed exchange rate. But since the Bretton Woods exchange rate regime collapsed in 1971, countries with free floating exchange rates have moved to hold relatively few foreign exchange reserves, and in some jurisdictions the official reserves are formally held on the balance sheet of the finance ministry (Canada, Japan, UK). Leaving aside those countries with large foreign currency holdings, the size of the balance sheet needed to support domestic operations had historically (before the financial crisis starting in 2007) been small and dictated by the liabilities side: enough notes to meet public demand and enough commercial bank reserve balances to enable those banks to meet their payments (clearing) obligations. Pre-crisis, central banks in major developed economies would have relatively small balance sheets in line with these needs.

The assets side of the central bank balance sheet would normally be expanded in line with the desired level of liabilities: buying enough assets or lending to the banking system in just sufficient scale to provide a monetary base consistent with the chosen policy interest rate. Figure 1 shows a stylised representation of a central bank balance sheet. In this representation the elements are not to scale, and some components are netted and presented as assets.

As noted in Section 3, many central bank balance sheets expanded rapidly after the Great Financial Crisis: injecting liquidity consistently to try and stimulate (growth and hence) inflation which had

been running below target. Fisher and Hughes Hallett (2018) argue that this expansion will be persistent as a result of new liquidity regulations (the Liquidity Coverage Ratio in particular) which have dramatically increased the need for commercial banks to hold more liquid assets on their balance sheets. At the same time, the availability of cash liquidity in the market – especially under stress – has seen a marked reduction, again reflecting balance sheet regulations (e.g., leverage ratios, repo limits) and a new appreciation of undesirable credit risk in the inter-bank market.

**Figure 1: Stylised representation of a central bank balance sheet**

<b>Liabilities</b>	<b>Assets</b>
<b>Banknotes</b>	<b>Government balances (net overdraft)</b>
<b>Commercial bank reserve and deposit accounts</b>	<b>Lending operations</b>
	<b>Purchases of domestic securities</b>
<b>Issuance of monetary bills</b>	<b>Foreign Assets (net)</b>
<b>Capital and reserves</b>	<b>inc gold</b>
	<b>Other items (net)</b>

Notes:

- i) Government may have both deposits and overdrafts at the central bank. To simplify the presentation, these are shown as a net overdraft and hence an asset. Foreign currency assets/ and liabilities (which can also include government accounts on both sides) are shown on a net basis.
- ii) Elements are not to scale.

The most liquid asset a commercial bank can hold is its reserve account at the central bank. Any attempt to reduce the size of the central bank balance sheet will reduce the aggregate quantity of liquid assets. At some point, when liquidity availability reduces towards the threshold of market need, one could expect increased interest rate volatility. This is exactly what happened in the US in early 2019 as the Federal Reserve shrank its asset holdings alongside its increases in interest rates.

Fisher and Hughes Hallett (2018) argue that control over the composition, and to some extent the size of the balance sheet of the central bank, could now be manipulated for policy purposes to affect financial stability conditions, independent from monetary policy considerations. The 'new normal' for a central bank balance sheet is unknown exactly: but based on US experience we can safely assert that it is likely to be an order of magnitude higher than pre-GFC.

The expansion of central bank liabilities has little obvious impact on climate change outcomes: a central bank is unlikely to be able to set limits on its liquidity lending to particular banks to reflect climate risks for example. If any bank carried enough climate risk, then it would most likely be a supervisory issue first and foremost.

Given the persistent expansion of the domestic asset holdings of central banks, what assets should they hold going forwards? This is an open and new question, with little guidance or consensus. It is not even yet clear that central banks have recognised that there is a question to be answered (or at least it has not received any public consideration).

Although larger central bank balance sheets have been driven by monetary policy, the asset composition has received scant attention in monetary policy debates, let alone academic or public discourse. Central bankers may reasonably consider these assets to be monetary policy portfolios: the assets are purchased to achieve particular policy outcomes:

- i) they drive the desired scale of liabilities,
- ii) they may be concentrated in particular markets to help reduce spreads for particular asset classes,
- iii) their maturity may be chosen to influence the yield curve.

Beyond this, the precise composition of assets, such as by industrial sector, is not relevant to monetary policy.

It is quite likely that the stock of assets will vary in future – both up and down. But it seems very unlikely that the majority will be unwound. Most developed countries will continue to operate in an excess liquidity environment, albeit to a lesser extent than currently. So central banks will have a dormant portfolio of assets serving no policy purpose other than that they generate the required liabilities or have the broad market implications outlined above. Indeed, that was the intention of the neutrality principle.

There is nothing to prevent a central bank from selecting the composition of its assets to meet other policy needs, as long as these broad market objectives are met. This is not entirely a new proposition as we now illustrate.

### 5.1 *The experience of the Agreement on Net Financial Assets (ANFA) portfolios.*

The so-called ANFA portfolios held across the Eurosystem central bank balance sheets receive little public attention, but they correspond to assets held on central bank balance sheets which are not considered to be monetary policy portfolios. These portfolios reflect the construct of the Eurosystem, and they have the effect of enabling certain central banks to offset low-yielding monetary policy assets with higher yielding and longer-term asset holdings.

Net financial assets (NFAs) are those assets on a central bank balance sheet not related to the implementation of monetary policy and include items like national foreign exchange and gold reserves, securities, emergency liquidity assistance (on the asset side of the balance sheet) and deposits from non-monetary policy counterparts, such as the government or foreign central banks (on the liability side of the balance sheet).<sup>16</sup> NFA positions are essentially a balancing figure and are heavily influenced by the liability side of the balance sheet. For example, other things equal, as government balances with the central bank increase (liability item), we expect market operations to increase (asset item) and to see NFAs to reduce<sup>17</sup>. The corollary is that if the central bank increases its holdings of government bonds for its own investment purposes (asset item), we expect to see reserves (liability item) grow in tandem and NFAs to increase.

While these NFAs are related to non-monetary assets and liabilities, it is important to note that the size of central banks' non-monetary portfolios have implications for monetary liabilities, and hence monetary conditions. When a central bank purchases or sells assets, its actions are also reflected on the liability side of the balance sheet and have the impact of altering the supply of central bank reserves, or base money, as described earlier. This means that when a central bank is making independent changes to its non-monetary policy portfolios, it is also having an impact on system wide monetary conditions. The ECB has put in place rules to limit this independent behaviour, so that individual national central banks' actions in the market do not interfere with the ECB's overriding monetary policy objectives. The ECB's Agreement on Net Financial Assets sets out the parameters around the size and management of euro denominated non-monetary policy portfolios. This agreement allows Eurosystem central banks to hold net financial assets for general investment purposes, employee pension funds, or foreign reserves (ECB, 2016). Assets held are managed in line with each central bank's own risk control and investment guidelines.

The ECB's Governing Council sets limits on the maximum amount of NFAs for each central bank and reviews compliance to ensure that these holdings do not interfere with monetary policy implementation. The size and management of these holdings are then subject to regular assessment (against Article 14.4 of the ESCB Statute). The ECB would also likely assess compliance with any

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<sup>16</sup> The ANFA agreement allows central banks that carry a disproportionately high share of low interest earning monetary policy assets to increase their holdings of higher interest earning financial assets. In doing so, the agreement essentially aims to protect the Eurosystem's liquidity position and therefore limits the central bank's NFAs.

<sup>17</sup> This is what we have seen in practice. Taking Germany as an example and according to its annual accounts, in 2015 (and again, other things equal), its liabilities to non-euro residents in euro stood at just €27 billion and its average NFA holdings for that year were minus €17 billion. In 2020, the same liability stood at just under €257 billion, while its average NFA holding was minus €248 billion.

internally defined issuer limits (similar to that done for public sector monetary policy purchase programs).

The average value of NFAs for 2020 is presented in Table 2. In some cases, we see that the average holdings in 2020 were negative, meaning that in these instances the size of the non-monetary policy items on the liability side of the balance sheet are higher than those on the asset side (Bundesbank, 2016). The next column presents the ‘historical waivers’ which provide the absolute minimum entitlement of NFAs that each NCB can hold (as per the Agreement).

**Table 2: Eurosystem NCB and ECB 2020 Average Net Financial Assets Holdings versus Historical Waiver (in €billion)**

Central Bank	Average NFA holdings in 2020	Minimum entitlement of NFAs	Difference	Difference as a percent of NCB balance sheet
Austria	1	15	14	6%
Belgium	4	15	11	4%
Cyprus	-5	4	9	40%
Germany	-248	72	320	13%
Estonia	0	1	1	7%
Spain	7	50	44	4%
Finland	-11	9	20	13%
France	-72	63	135	8%
Greece	-15	22	36	20%
Ireland	-6	5	10	7%
Italy	66	70	4	0%
Lithuania	-1	6	7	27%
Luxembourg	-6	5	10	5%
Latvia	-1	4	4	19%
Malta	0	3	2	24%
Netherlands	-46	18	64	14%
Portugal	-5	14	19	10%
Slovenia	-4	5	8	32%
Slovakia	-20	17	37	59%
ECB	-9	0	9	2%
<i>Sub-total</i>	<i>-368.2</i>	<i>397.5</i>		
<b>Grand total</b>			<b>765.7</b>	

Notes to table:

<sup>1</sup> Annual average Net Financial Assets for 2020 taken from the ECB website. Minimum entitlement is based on the historical waiver as per ECB, (2019b). In practice, there are three types of waiver: historical (as per the table just above), asset specific, and dynamic waiver. The waivers define a minimum entitlement of NFA that each NCB can hold, and the largest of the waivers applies. However, we only have public information on the historical waivers, and as such the use of this number is considered to be a very conservative approximation of an NCB’s total NFA entitlement, or effectively the absolute minimum level that the entitlement could be set at.

A conservative interpretation of these figures would indicate that in 2020 between actual average holdings and minimum levels of holdings as per the ANFA agreement, Eurosystem NCBs had combined headroom in their non-monetary policy portfolios to invest a further €766 billion in non-monetary policy assets – which could be green investments.

Why have central banks not taken up this ‘minimum entitlement’? There are a few possible reasons. Perhaps the anticipated return on assets was too low for them to do so (euro area central banks fund themselves at the ECB policy rate) or market conditions were just too uncertain. Another factor could be that the ECB is currently undertaking large-scale asset purchase programs and therefore there is likely to be less assets available that fall within a national central bank’s own investment criteria. Central banks may wish to stay clear of any trading (particularly in relation to sales) of assets that are also being bought by the ECB to avoid potentially confusing signals to the market. Of particular interest is the activities of the Bundesbank, which has stated publicly that it maintains a “*lean balance sheet*” and that it only holds assets in volumes “*as needed to fulfil its tasks*” (Bundesbank, 2015). Perhaps there is now an opportunity for the Bundesbank to pursue greater purchases and of ‘greener’ assets? The Eurosystem more generally seems to be moving in this direction and in February 2021, the Eurosystem agreed a common stance for applying sustainable and responsible investment principles to their non-monetary policy related portfolios (ECB, 2021b). The Dutch and Finnish central banks, for example, have already provided further detail on how their own investments will be managed to reflect greener considerations.<sup>18</sup>

To-date, different approaches are taken by Eurosystem NCBs around the level of disclosure relating to their ANFA holdings.<sup>19</sup> Any move in a greener direction would provide an opportunity to increase and standardise disclosure and frequencies across the central banks, which would only support the further development of greener markets.

## 5.2 *The experience of foreign currency reserves*

The question of asset composition should apply equally to domestic assets and to foreign currency reserves, to sovereign as well as privately issued securities. Indeed, one can usefully draw on experience with foreign currency reserves in different countries to analyse the options for domestic holdings.

The objectives for central bank holdings of foreign currency reserves would normally be two-fold: to protect public funds and for the assets to be easily mobilised if required for a policy intervention. So, one would usually choose a central bank foreign currency portfolio that was high credit and high liquidity, with strict market risk limits. That would generally mean a portfolio of supra-national, sovereign, or quasi-sovereign agency bonds. Returns would not normally be a first rank consideration and so foreign currency reserves are normally comprised of large holdings of bonds issued by the most trusted governments in the most relevant currencies: US Treasuries, German Bunds, Japanese Government Bonds, US housing agencies, multi-lateral development bank debt and similar.

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<sup>18</sup> For further detail, see <https://www.dnb.nl/media/pf5a4wmp/sustainable-finance-strategy-dnb-13-7-2021.pdf> and <https://www.suomenpankki.fi/en/bank-of-finland/sustainability/responsible-investment/>.

<sup>19</sup> Based on a review of the latest annual accounts for all national central banks and that of the ECB.

Only a small portion of foreign currency reserves are likely to be needed at any one time for policy purposes.<sup>20</sup> And so, such reserves can be divided into a liquidity tranche and a ‘secondary’ tranche that can focus a little more on returns, to reduce the overall cost of holding such reserves. Such a secondary tranche will still be relatively high credit but might take a more liquidity risk for example.

Whether tranching or not, a foreign currency reserves portfolio is not ‘market neutral’: it is chosen to meet the policy objectives.

The liquidity: returns trade-off is only marginally exploited by most central bank foreign currency reserve managers, where policy objectives are paramount. Only a few central banks are known to invest in riskier assets such as equities. Most central banks are reluctant to run the equivalent of commercial dealing operations: except for the largest foreign currency holders, they naturally lack the skills base, the pay structures, the appropriate IT infrastructures, the market access, and the risk appetite. So good practice is often to outsource tranches of foreign currency reserves to external managers – maybe 10-20% of the total portfolio. That can be done to both enhance returns and train central bank staff through observation. Beyond that, it is not uncommon for ‘excess’ national foreign currency reserves to be invested in a Sovereign Wealth Fund, which can operate on a more commercial basis, or through intermediaries such as the Bank for International Settlements. But any public sector funds management will likely be conservative in terms of risk taking, relative to most private sector fund management operations.

An interesting counter example is the Norges Bank which manages the Global Pension Fund for the Norwegian State. This Fund is the world’s largest single Sovereign Wealth Fund, and its staffing requirements are known to dominate the Norges Bank. In most countries, such a large investment management operation would be placed outside the central bank completely, but there are a few other exceptions.

## **6 The choice of assets is the green issue**

The expansion of central bank balance sheets in domestic currency has in practice led to large holdings of sovereign debt issued by the relevant domestic government(s). Our first observation is that this means that the finances of central banks and their own governments are going to be more closely entwined than ever before. It brings into greater focus the fact that, despite the policy reasons and legal arrangements for central bank ‘independence’, most central banks are de jure or de facto owned and ultimately controlled by their governments, and many have a formal call on such for recapitalisation if necessary (including the ECB and BoE).

It is clear that the greater part of the expansion of domestic assets by the major central banks will be persistent and these assets are not likely to become encumbered for other policy purposes. We assume that the broad allocation to maturity buckets can be maintained in what follows.

The question is whether there are valid policy objectives to help guide the composition of a central bank’s assets. The cost of managing public money should always be borne in mind but, historically, financial returns have been subordinated to all other objectives. The consideration we focus on in this paper is whether central banks should consider the possibilities raised by their entire asset

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<sup>20</sup> For a further discussion around tranching see World Bank (2020).

portfolio, or at least a substantial portion of it, as a policy vehicle to acquire green assets or at least to aid market development.

The concern is whether central bank should have any role in allocating capital/funding for particular types of investment. In the UK there have been calls for 'People's QE' demanding that central banks fund a variety of projects for the public good. In this paper we do not advocate central banks making choices that are normally the preserve of elected governments. Rather, we note that the practical choice facing a central bank is between buying sovereign debt or some other asset. Any decision to actively manage the central bank asset portfolio should be motivated by central banking objectives and not matters which are (party-)politically sensitive. Indeed, we also suggest that central banking policies need not and should not be undertaken in a political vacuum. Secondary objectives require central banks to support wider government economic policies. In order to ascertain and understand those policies, one might expect at least a dialogue between the authorities, if not a formal statement (as is the case in the UK). That would also allow greater transparency and accountability.

### *6.1 Contributing to broader policy outcomes*

Climate change is an international crisis (IPCC, 2021) and everyone, including those institutions acting in the public interest, have an individual and a collective role. Central Banks need to retain the trust and support of the public and may suffer in that dimension if they ignore social externalities, such as those related to climate change (Honohan, 2019). In fact, recent evidence also shows that there is clear public demand that central banks take action (ECB, 2021c). To help frame a discussion, we explore some examples of how central banks and in some cases specifically the ECB, have contributed to wider policy goals, focusing on the distinction between assuming responsibilities on the one hand and having a supporting role on the other.

Central banks implement monetary policy, but their actions do more. In many jurisdictions the government (operationalised through the Treasury and debt management operations) is responsible for yield curve development and maintaining liquidity at points in the curve through so-called benchmark issuance. Central banks support this by maintaining the short-end of the curve. On the basis that they have control over short-term interest rates, central banks provide the means so that medium- and longer-term rates can be formed by the market on the basis of expectations with regard to future central bank actions, and risk and liquidity premiums, which supports the government's/Treasury's objectives for yield curve development.<sup>21</sup> But that responsibility tends not to be recorded or acknowledged other than under general financial stability considerations.

Going further, an interesting example is the Eurosystem's involvement in the Short-Term European Paper (STEP) program. By the mid-2000s, it was clearly apparent that European short-term paper markets, a key money market instrument, were fragmented and were based on national standards and practices. While the integration of these markets was a market led approach, the Eurosystem nonetheless acted as a "catalyst", contributing by producing and publishing STEP data and also accepted as collateral 'STEP compliant' assets in its refinancing operations (ECB, 2008). It turns out

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<sup>21</sup> Of course, coordination between the central bank and the Treasury is key, as otherwise there could be tensions between both issuers which could fragment the short end of the curve.

that the approach taken by the ECB was fully aligned with the EU Commission's overall goal to create a single market for financial services as set out in its 1999 Financial Services Action Plan (EC, 1999).

A related example is that of the ECB/Eurosystem's ABS loan level initiative introduced following the GFC. The ECB's aim was to work with market participants with a view to improving transparency and facilitating better risk assessments of ABS transactions. ABS compliant with the new requirements were then potentially eligible for ECB refinancing operations and ECB purchase operations.<sup>22</sup> The BoE undertook a similar approach.

These examples demonstrate that central banks have an ability to influence market functioning and address impairments in market functioning, but such activities do not need to be a stated objective of the central bank and are not solely due to monetary policy considerations. Instead, the central bank's actions ultimately contribute to broader responsibilities, some of which reside with other authorities.

Where should central banks draw the line in terms of contributing to wider objectives? This is difficult to answer, but some considerations are as follows:

- Central banks should not go as far as investing in the equity of banks. This raises many challenges, not least because equities are notoriously hard to value, it can be difficult to understand the central bank's rights as shareholder and position should there be a default, and also ensuring there is no double default risk between the equity position and any liability to the central bank (say from monetary policy borrowing). There is also a clear conflict if the bank is also one that the central bank supervises (IMF, 2016). However, a central bank could invest in the debt of a bank, and many central banks do, subject to appropriate decision making and risk control arrangements. A core business of central banks is to fund the liquidity needs of banks that cannot be met in the market. The limit is that central banks should only engage with those banks deemed to be viable, that is, one wouldn't expect a bank be fully funded by the central bank unless that was part of executing a recovery plan, or if permitted, as part of a resolution plan.
- Central banks should only invest in vehicles that are transparent and accountable, where it is clear that the funds being provided are only used for the intended purpose and are not misappropriated for other purposes, such as financing general exchequer needs. Here it may be worth leveraging the approach to public asset management companies, with emphasis placed on the availability of operational and financial plans, audited financial statements and oversight and accountability, for example by a parliamentary committee (IMF, 2020).

## *6.2 Correcting market failures*

In the paper so far, we have argued that taking action in respect of climate change is within the existing mandates of central banks: in many countries it is consistent with formal secondary objectives and in all countries, one could argue that climate change affects a central bank's primary objectives. We have also argued that the expansion of domestic currency assets on the central bank balance sheet gives a degree of freedom, with the detailed composition of those assets not – yet –

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<sup>22</sup> ESMA has now established loan-level requirements for newer ABS transactions.

allocated for a specific policy purpose. So central banks could alter their balance sheet composition to favour green assets, beyond their corporate bond portfolios. But even if one accepts that such a policy is permissible and possible, that is not sufficient to justify it as a policy. One must first ascertain what the intended outcomes of ‘greening the balance sheet’ should be.

First, we note that central banks would not normally expect to be active investors. They do not acquire their asset portfolios for reasons of return or intrinsic interest and would find it incongruous to vote at Annual General Meetings, sit on boards or take part in other ownership duties for example. Rather the central bank choice is a portfolio allocation, undertaken with policy motives.

Government policy in both the EU and the UK is to transition to a low carbon-emitting economy, targeting net-zero emissions by 2050. Ideally, the financial system would play a role in that by supplying capital to support the transition. This is not wishful thinking: the economy is constantly in transition and the financial sector has always funded the necessary investment. In the past that has enabled transitions such as the industrial revolution, electrification, the automobile, and the internet. One would expect financial capital to flow where it was needed based on normal market workings. Only where there is an evident market failure would there be a case for public intervention.

One would expect the precise nature of the market failure to dictate what the appropriate policy response was for a central bank.<sup>23</sup> So we next consider some potential market failures.

*i) Insufficient demand for green assets?*

Much of the popular discussion around sustainable finance is about ensuring that enough capital is allocated to investments that would be consistent with the transition to net-zero. It is common to see estimates of the investment needed, perhaps compared with, say, the current stock of green bonds. But such an approach does not establish that there is insufficient demand for green assets. On the contrary, the evidence from the green bond market is that demand is out-stripping supply. New issues are not just over-subscribed – which is quite normal in capital markets – but dramatically so. And investors in green bonds are increasingly prepared to pay a premium to obtain them, rather than expect a discount (Climate Bonds Initiative, 2021). Overall, we have little evidence of insufficient demand. Rather, international investors seem willing to buy any asset that comes to market portrayed as green (generating “green-washing” concerns).

If there is an underlying market failure holding back the growth of green assets, that is likely to be that reducing carbon emissions has public benefits but does not always generate private financial returns. Hence many potentially green projects might not be investable by the private sector and hence not offered. In such circumstances one might expect two types of policy intervention to be justified: direct public-sector investment funded by sovereign debt, or interventions that alter private incentives. For example, the use of taxes and subsidies could make private costs and benefits align better with public costs and benefits. Both would be policies for central governments to pursue rather than central banks. For example, in countries such as the UK and Spain there were initially subsidies for renewable energy to establish the technology, the infrastructure etc. These have since been largely removed.

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<sup>23</sup> See IMF (2017), for a discussion around a central bank’s market maker of last resort function and the tools available to meet different forms of market failure.

If central banks were to buy large quantities of green bonds given current demand and supply conditions, there is a possibility that the consequences would be perverse. By taking liquidity out of the market and forcing up the price of green bonds in the process, that could damage the nascent growth in private markets by making them unattractive for private investors. The case for central banks adding substantially to demand to encourage more issuance, is at best uncertain.

ii) *Mispricing of risks*

A second market failure currently could be that financial markets are not adequately pricing in climate-related or other sustainability risks (CFTC, 2020). The current policy approach to address this is to enforce greater disclosure of those risks. The TCFD recommendations for voluntary disclosures have been endorsed by many governments world-wide and related, mandatory disclosure rules are currently being implemented in the EU and the UK. It is not clear how large-scale purchases of green assets by a central bank would help to address the fundamental issues leading to mispricing.

It is possible that central banks could make a contribution to pricing risk through small-scale purchases. The Bank of England (BoE, 2021b) has set out some considerations as to how it might 'tilt' its corporate bond portfolio to make it greener and has launched a consultation on the proposed principles and approach it might use. If the market and the BoE could agree on a common approach to price risk, that might help set market standards going forwards. This would be positive but would not in itself justify large-scale purchases. The ECB is also on record stating that it will adjust the framework guiding the allocation of corporate bond purchases to incorporate climate change criteria (ECB, 2021a).

iii) *Lack of definitions*

As of mid-2021, there is really only one established green asset class: green bonds. Although there is investment screening for Environmental, Social or Governance (ESG) issues by many investors, and talk of 'green' loans, there has been no formal definition of what counts as 'green'. Rather, green bonds have been supported by market-led voluntary principles such as those established by the Climate Bonds Initiative (CBI) and the International Capital Markets Association (ICMA). These enabled the green bonds market to grow rapidly from \$41bn in 2015 to \$297 bn in 2020<sup>24</sup> but the market has not been without controversy and that led to the proposition within the EU that there should be an official 'taxonomy' of what is green (EC, 2018).

The new EU Taxonomy is an advanced state of delivery and other jurisdictions, including the UK, are following progress and/or developing similar schemes. In Europe the plan is for the Green Taxonomy to support a new 'European Green Bond' label and to underpin a variety of new rules and regulations, including for disclosure.

The lack of definitions and asset classes is a problem for central bank operations, which normally relies on market conventions. There is no obvious central bank intervention required to promote such definitions, other than to observe, perhaps comment, and then use the classifications once finalised.

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<sup>24</sup> Source: Climate Bonds Initiative website.

iv) *Lack of fiscal room*

There is a strong case for saying that it is for governments to direct capital to green purposes, not central banks. But government budgets are plainly over-stretched. Many governments were still attempting to consolidate following the GFC, and since the pandemic hit in 2020 there has been a huge increase in public expenditure and reduction in tax take across the globe. As of mid-2021, markets seem to have no problem buying and holding the extra sovereign debt at low interest rates, at least in developed countries. But given the expansionary fiscal policies induced by the pandemic, and the possible debt servicing costs should interest rates need to rise, governments will generally be seeking to reduce their deficit levels where they can in future. That raises the question of whether publicly justified green investments will be curtailed by funding concerns.

Theoretically, there would be nothing to be gained by central banks directly funding public green projects instead of the government, given that would entail the central bank holding less sovereign debt. At best it could be argued that there might be some presentational gain from the central bank intervening in this way, perhaps to separate out the funding of green projects from general government investment.

### *6.3 Balance sheet management considerations*

In addition to correcting market failures, central banks should manage their own balance sheets in a prudent fashion. This suggests more immediate actions.

i) *Risk Management.* A clear case can be made on risk management grounds for avoiding or at least reducing the brownest assets within any central bank portfolio. The credit and market risk from climate change may well be under-priced. As guardians of public money, central banks should try to reflect the true credit risk in these assets. That should already be steering central banks away from buying 'brown' assets outright, and would indicate higher haircuts for collateral, assuming that such risky assets can be identified and classified. But this is only a marginal issue where central banks are primarily holding sovereign debt issued by their own government. The primary policy to tackle the underlying market failures of pricing is climate-related financial disclosures and/or government taxes and subsidies.

ii) *Operational considerations.* If a central bank was to be tasked with acquiring and managing a pool of green assets, can it do so effectively? In part the method would depend on the reason for doing so.

The operational challenges primarily relate to the fact that central banks are not active investors and they have limited ability to make credit judgements, being used to buying classes of assets rather than allocating capital between issuers.

Learning from the management of foreign exchange reserves, the obvious solution would be to out-source the activity. There are several options then available, which vary in terms of the governance and direct involvement of the central bank:<sup>25</sup>

- Invest via a public sector asset manager. A central bank could place funds with a green investor such as the Bank for International Settlement's Green Fund, a National Green Investment Bank, or some other development bank such as the European Investment Bank. Alternatively, it could buy the debt issued by such agencies.
- Employ a commercial fund manager which specialises in green assets.
- Create an off-balance sheet Special Purpose Vehicle (SPV), funded by a deposit from the central bank.<sup>26</sup> Although not a standard procedure, this is how the Bank of England manages its QE asset purchases – through the Bank of England Asset Purchase Facility Fund (BEAPFF). The SPV could employ its own specialist staff (which BEAPFF does not).

These options should address most of the political and operational difficulties that a central bank would face, reducing it to one of writing the mandate for the investment, or finding an investment vehicle which already had an appropriate mandate. Out-sourcing might also address some of the concerns around intervention – the outsource agency may have more ability to 'trade' the assets and help add to market liquidity.

#### 6.4 Disclosure

In 2020 the Bank of England became the first central bank to publish a sustainability report, making disclosures consistent with the recommendations of the TCFD. It made its second annual disclosure in 2021. In practice, this didn't amount to a great deal of new information because the Bank of England's balance sheet – over £940bn at end February 2021 – is comprised mostly of UK government bonds. The climate exposures of BoE are therefore in line with those of the UK which has committed to being net-zero by 2050. The 2021 report did contain some useful information about its £20bn corporate bond portfolio – where carbon emissions reflect the market and hence are consistent with a 3.0<sup>o</sup> warming (revised down from 3.5<sup>o</sup> in the 2020 disclosures).

The disclosures were not quite fully consistent with TCFD, which recommended that climate risks should be disclosed in a company's main financial filings and the Bank chose to issue a separate report, distinct from its Annual Report and Accounts. As a demonstration that central banks could engage in disclosures, the report has been a success, although some of the press coverage seemed to focus overly on the relatively small corporate bond portfolio.

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<sup>25</sup> The Bank of Finland, for example, relies on an external provider to screen issuers as to compliance with international sustainability standards. See: <https://www.suomenpankki.fi/en/bank-of-finland/sustainability/responsible-investment/>.

<sup>26</sup> Or alternatively, there could be an issuance of debt by the SPV. Either way, the rate of return should be at least at market rates (but could be issued at rates based on the expected return from the underlying investment(s)) and the central bank should not hold a subordinated position.

## 7 Summary and conclusions.

Central bank balance sheets are important for policy purposes. But their expansion after the Great Financial Crisis is not going to be fully reversed. Their asset base will remain considerably expanded and the precise composition of the assets held is not established by any particular policy need, other than the required injection of base money, and perhaps their average maturity. There has been little debate about the desired composition of those balance sheets in the medium-term, but that is a choice which could be made to help meet some relevant policy objective. Fisher and Hughes Hallett (2018) argue that the composition and size of the balance sheet could be adjusted to affect financial stability conditions, without compromising monetary policy objectives.

In this paper, we argue that central banks have the capacity to fund a portfolio of green assets using their balance sheets, should they establish a clear policy objective for doing so. It is both within mandate and feasible. But as it stands, with green assets generally undefined and green bonds in apparently short supply, there is not a clear and obvious policy justification for large scale purchases. There is a case for being involved in market development in order to encourage growth in green markets.

One could justify public investment if there were desirable green projects that were not financeable in private markets, perhaps because of some market-segmentation or simply an unattractive risk-reward trade-off. Central banks do not need to earn commercial rates of return, although they would also have low appetite or credit risk. They can, however, take substantial liquidity risk or otherwise invest in long-term assets – not least because they can always create domestic currency should the need arise. So, there may be a gap they could fill. But central bank staff may not be best placed to make those judgements.

If a central bank did have – or was given - a policy objective that justified the acquisition of a green asset portfolio, such could be achieved indirectly through outsourcing: either using independent managers, or funding independent investment vehicles so that the central bank needn't be directly involved in individual capital allocation decisions.

It is likely that the debate over greening the central bank balance sheet will continue. The arguments advanced in this paper suggest that this debate should move on from the question of mandate and should not be limited to small corporate bond portfolios, nor limited by modalities of the operations. A wider perspective is needed focussed on what actions would be most effective in helping to align financial investment with climate change mitigation and adaption.

September 2021

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