

# The future for central bank balance sheets and their potential use as a macroprudential tool

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## 1. Introduction: the importance of the central bank balance sheet

The balance sheet of a central bank is its defining feature, one that makes it the monopoly supplier of base money in the national currency; allows it to set interest rates for monetary policy purposes, and/or control the narrow money supply (including the issuance of bank notes); and be lender of last resort to the banking system (LOLR).

Financial stability and prudential regulation normally do not require use of the central balance sheet and so those activities are not always and everywhere part of the same institution. However, synergies with central bank operations means that there are significant gains to be had from working closely together. Most central banks now have at least some financial stability responsibilities and, at a minimum, a strong

interest in prudential regulation. This note outlines some ways in which those linkages have recently grown. Even where a central bank does not have financial stability explicitly in its remit, it has the ability to seriously affect it.

Central bank balance sheets are typically similar across countries in certain key features, but with important variations such as in the management or not of foreign exchange reserves. But most central banks are responsible for at least two aspects of their national payments system: the domestic note issue and providing bank accounts for commercial banks to facilitate inter-bank payments. These two forms of liability represent 'central bank money' (which also one defines one measure of the narrow money supply).

The ten years since the Great Financial Crisis (GFC) in 2008/09, saw an unparalleled expansion of central bank balance sheets. This was a

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<sup>1</sup> I am extremely grateful to Diarmuid Murphy for comments. Any mistakes in this note are the fault of the author.

<sup>2</sup> The original thoughts behind this note were developed whilst the author was Executive Director of Markets at the Bank of England 2009-2014. But the views expressed herein should not be attributed to the Bank of England.

consequence of short-term nominal interest rates having reached (close to) zero and central banks then deciding to loosen further by expanding the money supply directly - so-called 'Quantitative Easing' (QE). In its purest form QE is (literally) simply a text book monetary expansion.

At first that expansion was to stem the financial crisis of 2008-09 which impacted severely on the real economy in many countries. After mitigating the initial crisis, the main aims were to try to prevent deflation and support the recovery of the economy from recession. This note does not address the efficacy of past QE but instead considers what might happen to central bank balance sheets in future.

In 2018, the global economy is at a stage in the financial and real economic cycles when policy-determined interest rates are rising, and central banks are considering whether, when and how their balance sheets should be 'normalized' i.e. the QE expansions unwound. But financial conditions have changed since 2006 and it may no longer be sensible to take those balance sheets back to pre-crisis levels. This note sets out how new prudential regulations may mean that central bank balance sheets, even if they unwind somewhat, could remain expanded relative to pre-crisis levels.

The primary consideration for any degree of unwind will be to set the money supply consistent with the desired level of interest rates. But since the money supply does not appear to be very interest rate sensitive, that may span quite a wide range. And, for any given desired stock of money supply, there are many attendant decisions on how to maintain the central bank balance sheet at a particular size that do not primarily have monetary policy implications. This note argues that those decisions are nonetheless important - for financial stability.

## 2. Central bank liabilities

The liability side of the central bank balance sheet is the most directly important for monetary policy. Its two main components are bank notes and the 'reserve accounts' held by commercial banks (and, sometimes, other private sector agents). These two components make up base or 'central bank money'.

The main counterparties of the central bank are usually commercial banks. Since the clearing and settlement of payments between commercial banks happens across their reserve accounts it would be unusual for a large bank not to have a reserve account.

The commercial banks need physical cash to supply to their customers, whether individuals or corporates (e.g. retailers). Banknotes are usually supplied by the central bank to commercial banks on demand in exchange for payment taken from the commercial banks' reserve accounts. Because cash is determined by private sector demand, in a relatively predictable way, this note takes the demand for cash as a given.

The reserve balances held by commercial banks are the highest quality, most liquid asset they could hold. Pre-crisis, the main use of reserves was to meet inter-bank payments flows, cleared and then settled across reserve accounts. That use is still very much present but the level of reserves needed for pure payments purposes is small and relatively predictable. Demand for reserve balances for other purposes has dramatically increased.

### **The interaction of central bank liabilities with the new prudential regime**

Since the GFC, the international Basel III regime for prudential regulation has agreed new liquidity requirements for banks. In particular the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). Broadly speaking, the LCR specifies a minimum level of High Quality Liquid Assets (HQLA), officially defined, that must be held to meet potential outflows. The NSFR requires that assets must be backed by an appropriate proportion and maturity of stable, or term funding. Assets are weighted by duration and/or liquidity properties for the stable funding requirement to be calculated. Hence the LCR and NSFR look at liquidity risks on the liability and asset sides of the balance sheet respectively.

Another new key prudential measure, this time applying to capital, is the Leverage Ratio. This limits the ratio of a bank's total assets, unweighted, to its capital resources. Because the leverage ratio is not risk sensitive, it tends to bind on low-risk, high

volume transactions such as large repo books or mortgage loans which otherwise represent low levels of risk-weighted assets.

The market consequences of these regulatory changes are still being played out. On the one hand banks will be safer because they hold more and longer-term liquidity. On the other hand, the unsecured inter-bank lending markets have been shrinking, whilst secured markets are steady, but not expanding to fill the gap. Market making of less liquid securities has diminished where the return is not sufficient to offset the higher regulatory cost. These changes are important to the topic of this note because banks are less able to manage their reserve accounts by transacting with another bank. Reducing such network dependencies improves financial stability of the system but can reduce the options for an individual bank.

Reserve account balances at the central bank generally count as HQLA. But we do not yet know what proportion of their required HQLA, commercial banks will wish to hold in that form, as demand has been obscured by QE.

### 3. Central bank assets and their use in supplying liquidity

In order to supply liquidity through central bank money (create liabilities) the central bank acquires assets. Either by outright purchases or by (secured) lending to the banking system through (reverse) repo operations. Those operations are normally calibrated in scale to be consistent with the target level of interest rates. Prior to the GFC, smaller scale outright purchases were a routine part of central bank open market operations, alongside reverse repo transactions, to control the monetary base.

QE simply refers to the buying of financial assets in large scale, thus expanding the money supply. This constitutes an easing even when interest rates are near the lower bound. The impact of QE depends on what assets are bought and who from. In the UK most QE was purchases of UK government debt (gilts) – they are HQLA but were not typically held in large quantities by commercial banks. That was an

important factor, as the Bank of England wished to maximise the ‘Portfolio Balance Effect’ (PBE).

QE affects the economy through many channels. To summarise briefly, these include lowering long-term interest rates, stimulating bank lending, wealth effects through rising asset prices and lowering the exchange rate. The PBE comes from buying low-risk assets and thus forcing investors to hold alternative, more risky assets (e.g. see Joyce, Liu and Tonks, 2017). The effect is most powerful when the central bank buys low-risk assets that are, or would have been, held by the non-bank private sector. If a central bank buys assets that are held directly by banks, that may not have any further effect on the real economy at all since the banks - especially in a time of liquidity stress - may be content to sit on their reserves instead of the purchased assets.

Whomever holds the asset to start with, any QE purchases, of any asset, must result in correspondingly higher balances in reserve accounts. If QE is large, then the banks will end up holding more than they would choose. How do we know they holding excess reserves? One indicator is when there is no demand at all by banks to borrow in the central bank’s routine reserve supplying operations. And that is what happened.

The process of creating excess reserve balances is simple arithmetic. When a central bank buys assets it supplies base money in exchange. That base money must be held by the private sector either in the form of banknotes or in the form of commercial bank reserve balances. That is just an automatic consequence of expanding the money supply, nothing behavioural. An individual commercial bank could try to reduce its own level of reserves but collectively the banking system has to hold the total created by the central bank. The behavioural impacts largely come via the channels through which the money flows on its way through the financial system.

Having massively expanded reserve balances counting towards HQLA almost certainly made it much easier for commercial banks to collectively meet their LCR requirements and possibly their NSFRs. Individually they might have needed to

compete to get 'their' share of customer deposits but there was plenty to go around.

The reason why this is only 'almost' certain is that it depended on whether the banks received their reserves from their counterparties or customers in the form of stable funding. Retail deposits are treated as 'sticky' and hence do not require matching HQLA. Similarly, if banks were able to issue more term debt, that would also be treated as sticky funding (until near maturity). Both would also count as stable funding for the NSFR. But to the extent that QE instead generated a rise in corporate or financial sector deposits, for example, then higher LCR requirements would just offset the liquid assets increase.

The fact that QE occurred just before liquidity regulations were tightened is not purely coincidence in the sense that both reflected the consequences of the financial crisis. But the policy choices were initially made independently by monetary committees and the Basel Committee. Once the full implications of the original regulatory design became clear, central bank governors and national legislators started to make changes to the regulations to offset some of the harshest implications – for example allowing proportions of less liquid assets to count towards HQLA.

In summary, the new liquidity regulations increased the demand for HQLA and hence central bank reserve balances. And those reserves were independently increased so that the extra demand was more than met. Part of that effect would have been offset by short-term deposits arriving at commercial banks through wholesale or corporate channels.

QE was undertaken when policy interest rates were reduced to near-zero, or in some cases below zero. Looking forward to when interest rates rise significantly, the yield curve is likely to become more upward sloping, and it is possible that banks will then decide they would prefer to hold assets with higher rates of return and risk. Given this risk-return judgement, and their LCR demands, the demand for reserve balances could remain very much higher than the pre-crisis demand for payments buffers.

To give some idea of the magnitudes, the level of reserves created by and held at the Bank of England rose rapidly from under £20bn in 2006, to nearly £40bn in late 2008, to £300bn in 2014, and was further boosted by the Term Funding Scheme (TFS) in 2018 to just under £500bn. For most of the crisis period, this was well in excess of demand: commercial banks stopped borrowing from routine sterling liquidity supplying operations. But not so now: commercial banks are currently collectively borrowing around £4bn from the Bank. Small, but not zero. Indeed, the amount had risen to around £25bn in 2016 before being effectively displaced by the TFS.

If our understanding of the implications of this behaviour is correct, either there has been a problem for some banks attracting a sufficient share of funding in the market, or collectively, at current interest rate levels, the commercial banks are content to hold an order of magnitude more in their reserve accounts than 10 years earlier. We can't be sure which from the outside and both may be true. One indication of higher demand for reserves is that banks did not try to individually shed their expanded reserves balances by lending them – lending growth has remained subdued. Another piece of evidence is that, with excess reserves, short-term market rates could dip well below the policy rate as individual banks discourage large short-term deposits. That happened for a while during the first years of QE but is much less prevalent now, in any major jurisdiction.

The latent increase in the demand for reserve balances internationally raises some serious policy questions for central banks as they seek to raise interest rates from crisis levels and decide how much of their QE needs to be unwound. (i) What is going to be the level of demand for reserve accounts, given the LCR? And (ii) How sensitive will that demand be to the level and slope of the yield curve?

To the extent that central banks do continue to supply many more reserves than they did previously, they would have a number of choices to make about how to do so. The big policy questions are exactly how big the balance sheet should be, and what assets should be held. Furthermore, different operational parameters and choices can lead to the same level of

monetary supply and/or interest rates, but may have quite different effects on regulatory metrics and hence financial stability. This note argues that those effects need to be recognised and such choices made actively, preferably under a transparent financial stability remit.

## 4. Balance Sheet Choices

### 4.1 Balance sheet size

At the time of writing, one might expect the major developed country central banks to be contemplating how much, and how quickly to reduce the size of their asset holdings, given the desired monetary policy stance. In theory the money supply needs to be kept in line with the demand for reserves at the chosen policy level of interest rates: as rates rise one would expect the demand for money to fall. We suggest several reasons why that might not be the case.

Pre-GFC banks were reasonably attuned to keeping reserve balances in line with a target, but that was mainly because of the potential penalty imposed by the central bank if they held an excess or a shortage. Absent those penalties, the overall level of reserves was generally considered to be only mildly sensitive to interest rates.

Most observers have been surprised that large expansions of the narrow money supply via QE did not cause a lot more price inflation. We may have already partly explained the answer – the extent to which the bank lending channel was offset by higher liquidity requirements. But there are a couple of other considerations.

QE is likely to be particularly powerful in a liquidity crisis, when markets are dysfunctional and liquidity is precious. In such circumstances it may not be possible/easy/cheap to swap any security, even normally liquid securities, for base money. The sustained peaks of that dysfunction were in 2008-9 after the collapse of Lehman Brothers and AIG, and then again in 2011-12 as the eurozone crisis unfolded.

As market conditions have settled down, it is likely that the effect of QE on financial markets has considerably diminished. It is also arguable that continuing QE in the US and euro area has been increasingly less effective – in both stock and flow terms – because market functioning has improved. That change in market conditions gives a prima facie reason to suppose that unwinding QE, would not have the equal and opposite effect of implementing QE in the crisis period.

A second reason for the weakening of monetary imperatives is that monetary policy should only ever have short run or second-order effects on real outcomes. It is quite likely that real interest rates today are being driven mostly by real, not monetary factors. Indeed 10 year real US interest rates are now about the same level as they were before the Fed started QE. If QE is unwound slowly, perhaps by allowing assets to mature, then that is unlikely to have a big independent impact on real interest rates and hence the real economy.

Overall, the monetary case for tightening by reducing balance sheet size may not be very strong. That means that the financial stability policy implications could be given relatively more importance: the size of the balance sheet will affect the ease with which banks acquire their HQLA needed to meet their LCRs. In part, the outcome could be empirically determined: if QE is unwound and banks see their HQLA shrinking too far, one can expect some strong signals in the market – bidding up for deposits for example – as the price of liquidity starts to rise. To the extent that was consistent with the intentions of monetary policy, then it would not be a problem, although there is a risk of volatile or excessive changes in market rates if banks are struggling to meet their regulatory metrics.

### 4.2 Excess cash or shortage and influencing market rates

One framework decision for a central bank is whether to operate normally with an ex ante excess of liquidity or a shortage. The main consequence is whether the central bank ends up supplying or draining liquidity at the margin. Pre-crisis, the more

common approach was to operate with an ex-ante shortage, alleviated by lending. But operating with an ex ante excess that is alleviated by draining could be a more effective way to ensure that all banks have the liquidity they need. On the other hand, in order to maintain LOLR capabilities, it is likely that central banks will want to maintain some regular lending operations, although they could both lend and drain simultaneously, which might be necessary if interbank markets were to continue to diminish.

### 4.3 Corridor or floor system for interest rates

In a market-based economy central banks can never ensure that market rates follow their policy rate exactly, even for very short rates. So, arrangements are normally made to try to guide market interest rates to stay close to the policy rate (see e.g. Fisher, 2011 for more detail). Maximum and minimum rates can be set to define a 'corridor' around the policy rate to limit volatility. This can be implemented through special facilities for commercial banks to borrow or deposit overnight, such that there is never an incentive for the commercial banks to operate overnight at rates outside the corridor.

Under QE, with very substantial excess base money injected by the authorities, most central banks have switched to a 'floor' system for rates, rather than a corridor. There has been so much excess base money that rates were quite likely to fall below the policy rate and were very unlikely to rise above it. In such a world, a fixed rate on all deposits at the intended policy rate, can help ensure market rates behave in line with policy intentions. At the ECB, their marginal deposit rate became the de facto policy rate, displacing the main weekly refinancing rate at which the ECB offers to lend reserves. The Bank of England suspended its reserve targets. The US Fed required a change in US law so that they could pay interest on excess reserves.

If central banks allow LCRs to be met principally by reserves, then complicated rate-setting systems would not be necessary nor would they appear very attractive. A continuation of a simple floor system would probably work well to guide market rates closely to the policy rate.

### 4.4 Composition of assets: outright purchases vs lending/draining

Before QE, central bank preferences were to keep routine operations manageably small and outright purchases could be used in order to create a small ex ante shortage, or small excess of reserves, offset either by lending, or draining respectively. The shortest-term operations are generally undertaken at the policy rate and so market interest rates are set, or at least strongly influenced. Longer-term operations are usually conducted through an auction so that the price for term liquidity is market-determined and no signals are sent about future policy decisions.

Buying/selling an asset outright does not involve a long-term contract with a bank counterparty, and a lending/draining operation does. A consequence of this difference is that whilst outright purchases of assets automatically boosts the collective level of commercial banks reserve balances, the distribution is not controlled, either in form or quantity. Thus outright holdings manage system-wide liquidity whilst lending/draining provides a more certain liquidity management option for an individual counterparty. If interbank markets are working, then the quantity can be passed around as needed by that market, but that may not be the case in a crisis when liquidity is hoarded.

Some combination of both is therefore likely to be needed – but if systemic liquidity is in short supply the direct relationship becomes more important. So in the very first stages of a crisis, extra liquidity is likely to be supplied by lending directly to banks. If a large injection of system-wide liquidity is need, then QE may be the more sustained answer. QE also may generate more stable funding than short-term central bank loans, depending on precisely how the money reaches the commercial bank.

There are, of course, risk issues with the purchase of very large quantities of assets. It is likely to make the exchange rate fall – although that may be a desired outcome. Buying government bonds can be thought of as credit risk-free but it is not completely free of all risk. First it ties the central bank in somewhat to fiscal outcomes and if there does become a risk of government default then wider considerations apply

which would include risks to central bank independence. Buying government bonds also implies a once-off, possibly temporary, monetary financing of government expenditure. There is also the market risk on any portfolio of longer-term securities. And if private sector securities are bought, there is credit risk. Government guarantees might be needed, which could be seen to infringe independence. And a stock of assets has to be managed – it would be bad for markets not to maintain a securities lending programme for example. But all these risks can be, and have been, managed.

#### **4.5 Composition of the balance sheet assets: what to purchase outright**

We have already noted that QE works more powerfully on the system when buying assets not held by the banking sector. And commercial banks' assets should be dominated by lending – to corporate or retail sectors. Loans would almost certainly not be purchased under any form of QE: it is more likely that loan assets would be taken as collateral than purchased outright.

#### **4.6 Collateral policy**

To the extent that the central bank chooses to use lending operations to supply liquidity, the policy question is what collateral it accepts. By widening eligibility to accept less liquid collateral, a bank can improve commercial banks' liquidity. Such a policy of 'Eligibility Easing' has been suggested by Huertas (2018), reflecting what some central banks actually did in the crisis.

If the central bank takes non-HQLA as collateral, as the ESCB does at the margin, then it would be offering a very powerful liquidity transformation that would directly impact on LCRs. Most central banks will be wary of doing that in any size. The use of appropriate haircuts should equalize the risk to the central bank to a large degree, although the haircuts can become very large (and uncertain to calculate). But collateral which is completely illiquid in the market, has virtually no opportunity cost when used with the central bank. So high haircuts would not

deter commercial banks from trying to utilise as much illiquid eligible collateral as they possibly could in order to get HQLA in return.

A consequence of very broad collateral eligibility in normal times is that commercial banks would be less liquid and less resilient than they appeared. In the extreme, such a broad collateral policy could be seen to undermine the objectives of the liquidity regulations themselves. It would also be likely to distort markets by reducing liquidity premia and hence price differentials of those assets that were eligible and traded, whilst increasing demand and supply of them. Or creating a 'false' market in assets that would otherwise not be tradeable.

The Bank of England at least, saw this coming. It introduced unique operations for lending against illiquid collateral, in which it defines three collateral sets with varying liquidity characteristics (see Fisher, 2011). In each Index-Linked Term Repo operation, any of the 3 sets can be used, with different bid prices allowed. Basically, higher prices and greater quantities are set automatically for the less liquid collateral, the more the commercial banks bid to utilise it. This is technically complex to implement but has functioned reasonably well in the period since it was established in 2010 (albeit that the demand for extra reserves has been low because of QE).

#### **4.7 Term of central bank lending**

Central bank lending operations, can be undertaken at a range of maturities. The target interest rate for monetary policy is usually short-term – until the next policy meeting. To facilitate that, at least some portion of lending/draining operations needs to be at very short maturities – typically daily and/or weekly. But very large operations increase operational risk for both central banks and their counterparties. So, typically, a portion of longer-term loans – typically no more than 12 months at most – can be used in part to reduce the turnover in the shorter-term operations, making the latter more manageable and the supply of reserves more predictable for individual banks.

But both the ECB and the Bank of England have also

engaged in multi-year loans as a crisis measure and to help support the real economy. The Bank's latest Term Funding Scheme has lent around £127bn for up to 4 years. Unlike its predecessor, the Funding for Lending Scheme (FLS), the TFS lends cash (the FLS lent 9-month Treasury Bills) and so has directly increased the level of reserve balances, which the FLS did not.

Liabilities of over 12 months remaining maturity are very useful to the banking system in that they represent stable funding which helps meet NSFR requirements. So, these central bank schemes have been helpful to NSFRs. But, by making cheap funding available to all banks at the same price, these schemes also risk suppressing competition between banks.

Will central banks be tempted to lend routinely at longer than 12 months? That is unlikely to be the case absent an economic crisis. There are political economy arguments which arise if the central bank ends up providing extensive term funding directly to commercial banks. It has unpredictable effects on competition and some inevitably benefit more than others. If the banks end up over-lending – e.g. to the housing market – then the central bank may take the blame. And if a bank over-extends itself using central bank funds, will the authorities come under more pressure to bail it out? There is more credit (and possibly thereby fiscal) risk associated with longer-term funding. Arguably, providing extensive long-term funding is part-way to having a nationalised banking system.

The Bank of England has already announced the prospective closure of the TFS and the ECB likewise the TLTROs. But given that similar political economy arguments could be levelled at outright purchases, one can't rule out such term funding operations entirely, at least as a crisis measure.

#### 4.8 Leverage ratio considerations

Central bank operations can also affect a commercial bank's capital requirements. Reserve balances are generally zero-weighted on a risk basis, so changes in reserves have no impact on risk-weighted capital

ratios. But they could have an impact on unweighted measures such as the leverage ratio, unless explicitly excluded.

Excluding reserve accounts turns out to be a sensible policy, and has been adopted by the Bank of England. Let us leave aside the fact that it is in the central bank's hands to determine the overall level of reserves, and in some regimes, each individual bank's holdings. The real issue is what happens dynamically over the credit cycle.

Suppose that there is a liquidity crisis or even just a straightforward economic downturn and the central bank decides that it needs to expand the money supply for monetary policy purposes. Supplying more reserves – by any of the methods described in this note – would add liquidity. But if those reserves were counted as assets for the leverage ratio, the injection of money would improve liquidity metrics but potentially increase capital requirements, wherever the leverage ratio was binding on a bank. So, in the capital dimension the policy would be pro-cyclical.

Exempting reserves from the leverage ratio calculation gives the central bank a clear macroprudential policy instrument through its balance sheet size. It could, if necessary, expand its balance sheet and offset any monetary effects via interest rates (perhaps by cutting rates less than otherwise given the likely circumstances of easing). That way it could use the two tools of interest rates and money supply simultaneously to help hit both monetary and financial stability objectives. This does pre-suppose that the demand for reserves is not very interest rate sensitive, otherwise there could not be two independent instruments, just the one.

## 5. Conclusions

In this note we have set out various ways in which a central bank might use its balance sheet, not just to set interest rates and the stock of base money, but to otherwise affect financial conditions by the choice of key parameters in their operations.

A central bank can set both monetary and macroprudential policy by changing selected

parameters of either lending or outright purchase operations. And the size of the operation is one, but not the only, parameter. Choices include all those outlined in this note, including: the framework of ex ante shortage or excess liquidity, purchases vs loans, what assets to buy or to accept as collateral, what term to lend at, their pricing framework, whether to maintain an ex ante shortage or excess, whether to have a corridor system or not.

A key point to note is that differential effects on financial stability - via market conditions and regulatory metrics - will result from these choices, regardless of whether they were intended. So they cannot just be ignored. This will be awkward for those central banks which do not have an explicit legal remit to maintain financial stability. One such case is the ECB whose remit under the various EU Treaties is specific about its monetary policy responsibilities but vague on financial stability responsibilities which are seen largely as a matter for national authorities.

Arguably it is much more important that all central bank operations work effectively in a crisis than that they work precisely in normal times. Ideally, a central bank needs to be able to loosen and tighten liquidity to reflect both macroeconomic and macro-prudential shocks.

In summary, this note shows how choices made when implementing both normal and crisis monetary operations will have an impact on macro-prudential conditions and regulatory metrics, whether the central bank intends to or not. Those impacts are not just unfortunate spill-overs but potentially powerful policy tools. Imaginative use of its balance sheet could give a central bank at least some of the weapons it needs to act counter-cyclically in support of financial stability. Given that macro-prudential instruments are in short supply, it is imperative that central banks are able to properly recognise and use those that they have. If that requires a re-think of central banks' financial stability remits, then that would be no bad thing.

## References

- Fisher, P.G., (2011), *'Recent developments in the sterling monetary framework'*, speech given at Manchester University and available here: <https://www.bis.org/review/r110401a.pdf>
- Huertas, T., (2018), *'Are banks still special?'*, The Journal of Financial Perspectives, EY Global Financial Services Institute, Vol 5, No 1, February. pp 1-15.
- Joyce, MAS, Liu, Z, and Tonks, I, (2017), *'Institutional Investors and the Portfolio Balance channel'* Journal of Money Credit and Banking, pp125-46.

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