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THE POLITICAL ECONOMY OF CENTRAL BANK BALANCE SHEET MANAGEMENT

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The topic of this session is the long-run management of central bank balance sheets. Once we are back to something recognisable as sustainable macroeconomic conditions, will central bank balance sheets remain very, even spectacularly large; should the monetary authorities continue, routinely or occasionally, to intervene in a range of asset markets; if they were to do so, to what ends, aggregate-demand management or substituting for broken markets that impede the transmission of monetary policy; should they be free to set negative marginal rates but carry on paying positive rates on the bulk of their liabilities; and should they seek to steer risk premia as well as the risk-free rate of interest?

My way into these questions will not be the positive economics of what works and what doesn't. That is partly because there are more than enough researchers contributing to those debates. But it is primarily because, big picture, the questions I have listed are about how a polity should choose to divide its fiscal powers between elected representatives and independent central bankers. In this, I am assuming that society chooses to maintain the independence of the central banks, as policy institutions with delegated purposes and powers that are, by design, insulated from the day-to-day politics of both the executive and legislative branches. That is not written in scripture, but lies beyond the scope of these remarks --- as do questions about the current conjuncture and central banks' more immediate policy choices.

My subject, rather, is the political economy of central banking and, in particular, whether the conditions for the democratic legitimacy of central banks have material implications for their balance-sheet management. In a nutshell, I think they do.

The structure is as follows. I shall open with two sections on, respectively, how central banks fit into the wider machinery for managing government's consolidated balance sheet, and principles for legitimate delegation to independent agencies in general. They provide necessary background to the articulation, in the third section, of some general precepts for central bank balance-sheet management. Those precepts are then applied, in the final two sections, to operations that do not entail entail credit risk and those that embrace a more active and direct credit policy[1].

Section A: Central banking as a co-manager of the state's consolidated balance sheet

Central banking is often discussed as though it existed in a separate part of the galaxy from the rest of government or, in slightly more nuanced debates, as if the only channels of influence that matter work in one direction: from government to monetary policy, via the risk of elected politicians embarking upon an unsustainable fiscal course that puts the monetary anchor in jeopardy. But this is a mistake. Central banks can occur losses and, depending upon the constraints under which they operate, can steer the allocation of resources within the economy: both matters usually regarded as reserved to elected representatives rather than delegated to technocrats.

[1] Some of the material here draws on "The Only Game in Town? A New Constitution for Monetary (and Credit) Policy", Myron Scholes Lecture, Chicago Booth School of Management, 22 May 2014, and on forthcoming broader work on the challenges of legitimate delegation in democracies. My thanks to Steve Cecchetti for ongoing discussions on many of the issues discussed here.

So where should we begin? One obvious place would be objectives. For example, the objective of central banks might be cast as nominal stability; or inter-temporal stabilization consistent with maintaining the nominal anchor; or broad monetary stability, defined to include the stability of the private banking system; or monetary stability plus some wider conception of financial stability. But, in fact, there is a rather more elemental starting point; one that is prior to objectives and questions of independence. It is to ask what a central bank *is*.

What do central banks do? Delegated managers of the consolidated state balance sheet

It is useful to think of the central bank as conducting financial operations that change the liability structure and, potentially, the asset structure of the consolidated balance sheet of the state.

If they buy (or lend against) only government paper, the consolidated balance sheet's liability structure is altered. If they purchase or lend against private-sector paper, the state's consolidated balance sheet is enlarged, its asset portfolio changed, and its risk exposures affected. In either case, net losses flow to the central treasury in the form of reduced seigniorage income, entailing either higher taxes or lower spending in the longer run (and conversely for net profits).

The state's risks, taken in the round, might not necessarily increase with such operations. If purchasing private sector assets helps to revive spending in the economy that might, in principle, reduce the probability of the state making larger aggregate welfare payments and receiving lower taxes. But the form of the risk would change and, because the driver was central bank operations, the decision taker on the state's exposures would switch from elected fiscal policymakers to unelected central bankers.

Seen in that light, the question is what degrees of freedom central banks should be granted to change the state's consolidated balance sheet, and to what ends.

A minimalist conception, articulated some years ago by Marvin Goodfriend amongst others, would restrict the proper scope of central bank interventions to open market operations (OMOs) that exchange monetary liabilities for short-term Treasury Bills (in order to steer the overnight money-market rate of interest). On this model, the lender of last resort (LOLR) function is conceived of as being to accommodate shocks to the aggregate demand for base money, and plays no role in offsetting temporary problems in the distribution of reserves amongst banks in the private money markets: if the money markets are closed, solvent banks simply go into bankruptcy if they cannot acquire reserves via the central bank's OMOs[2].

More to the point for macro policy, at the effective lower bound for nominal interest rates the only instrument available to the central bank would be to talk down expectations of the future path of the policy rate ('forward guidance')[3]. All other interventions to stimulate aggregate demand --- for example, quantitative and credit easing --- would fall to the 'fiscal arm' of government. And that, not a judgment on the merits of the minimal conception, is my point: what is not within the realm of the central bank falls to elected policy-makers, with the attendant problems of credible commitment and time-inconsistency.

At the other, maximalist end of the spectrum, the central bank would be given free rein to manage the consolidated balance sheet, which in theory would even include writing state-contingent options with different groups of households and firms. That would take central banks very close to *being* the fiscal authority, and cannot be squared with any mainstream ideas of central banking competencies in democracies.

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[2] See Tucker (2014), "The lender of last resort and modern central banking: principles and reconstruction", BIS Papers No. 79.

[3] 'Effective' rather than 'zero' lower bound because some central banks stopped at above zero due to the effects on banking system credit supply of going down to zero and because, more recently, some have set negative marginal rates. I shall use the expression 'zero lower constraint' to mean the low positive rate of interest at which a central bank faces a choice between the through-the-looking-glass world of negative interest rates and other 'unconventional' measures.

So in one direction, the state's overall capabilities shrivel, and in the other its functions are effectively either seized by or abandoned to unelected central bankers.

As I have said, we could try to resolve the question of boundaries through positive economics on the effectiveness of different instruments in responding to the various kinds of shock hitting a monetary economy. But, in addition to the inevitability of being hedged about with uncertainty, that approach does not speak to *which* arm of the state should be delegated which tools. The underlying problem appears to be that we don't know where the welfare advantages of credible commitment are outweighed by the disadvantages of the loss of majoritarian control, because that looks like a trade-off between incommensurable values.

This apparent dilemma is more pressing than for some while, for reasons of conjunctural fact, normative aspiration, and technological evolution.

The fact, of course, is that central bank balance sheets are currently massive. For that reason alone, there is simply no dodging the *need* to decide how far they should be shrink back as monetary conditions normalize; and if policymakers choose to maintain large balance sheets, whether there are reasons for preferring to hold some kinds of asset over others.

At a normative level, this opens up questions about purposes and objectives. For example, my friends and colleagues Ben Friedman and Jeremy Stein have respectively advocated that the Federal Reserve should (a) hold onto a large portfolio of mortgage-backed securities so that, by selling, it can lean against downward pressure on MBS credit spreads and hence on mortgage interest rates during bouts of stability-threatening exuberance; or (b) maintain a large Treasuries portfolio so that, by intervening in the repo markets, it could mitigate the pathologies of safe-asset shortages.

Both of those ideas turn on an argument that central banks either do or should have a mandate for stability; and that the best means available for pursuing that broad goal is to intervene in markets directly as opposed to, say, deploying dynamic macro-prudential or other regulatory powers.

But there is another, in some ways quite different, route to the realization that the question of balance-sheet strategy cannot be ducked. This doesn't start with the observation that central banks' asset holdings are currently massive or with a desire to develop new operational instruments in order pursue a revived interest in stability. Instead, it flows from a profound change in the technology of monetary-policy implementation. The traditional view --- represented in the 'minimal conception' described above --- assumed that all forms of central bank money, reserves as well as bank notes, yield zero in nominal terms and, thus, that in order to establish its policy interest rate in the shot-term money markets, the central bank buys (or sells) Treasury Bills to ensure that its (net) supply of reserves meets demand at the targeted interest rate. An alternative view, which seems to have been held by the Bank of England in the early 20th century, is that to set (not target) its policy rate, the central bank simply needs to be the marginal provider and/or taker of funds at its policy rate (or at a symmetric spread around its policy rate). That view, combined with a desire to remove the tax on reserves, led my generation of Bank of England policymakers to decide, some years before the 2007 phase of the crisis, that it would pay the policy rate on reserves. In different circumstances and for different reasons, both the ECB and the Fed now pay interest on reserves.

For the purposes of balance-sheet strategy, the import of this is that it has the effect of unbundling three choices: the policy rate, the size of the balance sheet (broadly, reserves), and the composition of the asset portfolio. But once that unbundling occurs, it is tempting to ask whether there are not, in fact, three instruments, potentially in search of three objectives[4].

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[4] In a system of voluntary reserves-averaging, as operated by the Bank of England up until QE, there are only two instruments: the policy rate and, given the endogenously determined quantity of reserves demanded (and

Whatever the route into the debate --- whether current realities, new objectives or expanded capabilities --- questions of powers, constraints and, therefore, purposes need to be confronted. And that is, ultimately, a question of how much it is both efficient *and decent* to delegate to an independent central bank.

To make progress with this question of boundaries, we need to ask about the conditions for independent agencies to have legitimacy in a democratic republic. As we proceed, the apparent tension between commitment technologies (efficiency) and majoritarian legitimacy (decency) will begin to resolve itself, but on condition of each polity imposing constraints appropriate to its democratic values.

Section B: The importance of legitimacy for independent agencies

Legitimacy is an odd thing. Latent vulnerabilities can persist for years, decades at a time, with the people apparently acquiescing in a polity's system of government, including its delegation of powers. But when things go wrong or are just disappointing or when it suits part of the community to remember some of society's deep norms and beliefs, those dormant concerns can rise with vengeance. By definition, independent-agency policy makers are not elected.

Unlike the elected organs of democracy --- and certainly unlike parliamentary democracy, where we the people can kick out a government without remotely questioning the *system* of government --- public dissatisfaction with an agency's stewardship of a delegated regime is not so easily separated from attitudes to the regime itself.

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accordingly supplied), the composition of the asset portfolio. But if the central bank sets a reserves requirement higher than the quantity that would be demanded at its price (the policy rate), it has all three instruments.

Central banks experienced that once in the 20th century: when politicians subordinated them after mistakes, during the 1920s/30s, in operating the gold standard and monetary policy more generally. But the point is by no means confined to central banking. While delegation can, under certain conditions, improve the operation of policy, making commitments credible or guaranteeing impartiality in adjudication and rule-making, it is fragile unless the public know what is intended and have means to challenge the results via debate and accountability. It is nothing short of astonishing that the 20th century's long march towards delegation, starting in the US before WWII and gripping Europe over the past 30 odd years, has not generated anything like a set of norms and conventions on whether and how to delegate. I believe that, alongside all the other challenges to politics today, that leaves avoidable fault lines in our democratic systems of government.

It would remiss to give the impression that this escaped the attention of central bankers and its penumbra in the academy. But the focus of those efforts, leading in my own country and elsewhere to the slogan 'operational independence not goal independence', was exclusively on monetary policy[5]. Little attention was paid to the LOLR liquidity-reinsurance function which called the Fed into existence, let alone to the broader issues of wider balance-sheet management and credit policy that now confront policymakers. I suspect that future generations will regard this, without unkindness, as no less of an error than it was of Prime Minister Peal in the 1840s, personally steering huge reforms of the Bank of England through the House of Commons, to regard note issuance as a quasi-state function but taking deposits from banks and others (what we call reserves) as a matter for the Bank's (then) private shareholders[6].

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[5] Abstracting from the substance of inflation targeting, this was part of the great wave innovation led by New Zealand in the late-1980s, and subsequently systematized and proselytized by Guy Debelle and Stan Fischer in "How Independent Should a Central Bank Be?" In *Goals, Guidelines and Constraints Facing Monetary Policymakers*, edited by J. Fuhrer. Boston: Conference Series No. 38, Federal Reserve Bank of Boston, 1994, pp. 195– 221.

[6] There is an elision in the expression of "taking deposits" because the central bank creates the money deposited with it. But, for the system as a whole, that is true of private-bank deposit-taking too. On the history, to this day, as a matter of statutory law, the Bank of England has two balance sheets (or, in fact, three given the use during the

Central bankers therefore need to think about the conditions for the legitimacy of their entire endeavor, not just the parts of it that (usefully) grip academician macroeconomic theorists.

1) *Principles for legitimate delegation to independent agencies*

Without seeking here to defend my views, I believe that the broad answer to the general question of conditions for the legitimacy of independent agencies in a democratic, liberal republic comes in three parts[7].

First, a policy function should not be delegated to an independent agency unless: society has settled preferences; the objective is capable of being framed in a reasonably clear way; delegation would materially mitigate a problem of credible commitment; and the policymaker would not have to make first-order distributional *choices*. Whether those conditions are satisfied in any particular field is properly a matter for public debate and for determination by elected legislators.

Second, the way the delegation is framed should meet five *Design Precepts*: (1) the agency's purposes, objectives, and powers should be set clearly by legislators; (2) its decision-making procedures should be set largely by legislators; (3) the agency itself should publish its *Operating Principles* for exercising discretion

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crisis and prospectively of SPVs for government-indemnified operations). Given the profound miss think that underlies this, a casualty of the Banking School versus Currency School battles, it is striking that it turned out to be remarkably convenient in determining seigniorage and, subtly, in buttressing independence. No Bank of England historian has penetrated this, so far as I am aware.

[7] A preliminary version of the *Principles for Delegation* was given in Tucker, "Independent Agencies in Democracies: Legitimacy and Boundaries for the New Central Banks", the 2014 Gordon Lecture, Harvard Kennedy School, 1 May 2014. A fuller explication is forthcoming. As well as reflecting my experience in helping to design delegated regimes in the UK, Hong Kong and elsewhere, the thinking underpinning various of the principles draws inspiration from the work of, amongst others, Alberto Alesina and Guido Tabellini on whether to delegate to technocrats; Paul Milgrom and Bengt Holmstrom on the incentive problems of multiple-mission agents; and Philip Pettit on forging the people's purposes and on contestability.

within the delegated domain, so as to make policy as systematic as possible; (4) there should be transparency sufficient to permit accountability for the agency's stewardship of the regime and, separately, for politicians' framing of the regime; and, (5) it should be clear *ex ante* what (if anything) happens, procedurally and/or substantively, when the edges of the regime are reached but the agency could do more to avert or contain a crisis.

Third, multiple missions should be delegated to a single agency only if: they are inextricably linked, and in particular rely on seamless flows of information; and decisions are taken by separate policy committees, with overlapping membership but each with a majority of dedicated members.

Since I am not going to get deeply into decision-making machinery here, it is the first two blocks of conditions --- governing *whether* and *how* to delegate --- that drive most of what I have to say about central bank policy frameworks.

2) *The need for regimes: high-level balance sheet policy*

At root, the *Principles for Delegation* require delegated responsibilities and powers to be framed as *regimes*[8]. That is how the apparent tension between credible commitment and responsiveness to events and to passing public demands can be resolved. Designing, debating and gaining broad acceptance of regimes lies at the heart of what applying the *Principles* to central bank balance-sheet policy amounts to. It places a special burden on today's generation of post-crisis policy-makers.

[8] Other papers have applied the *Principles* to the design of Lender of Last Resort regimes. See Tucker (2014), BIS, *op cit*; and, following the same broad structure as this essay, *The lender of last resort: regimes for stability and legitimacy,* to be published in a forthcoming book edited by Peter Conti-Brown and Rosa Lastra.

Of course, the *Principles* are not fully reflected in existing regimes, but they nevertheless provide guidance on how central banks should navigate through the gaps in today's incomplete contracts. In particular, the spirit of the fifth *Design Precept* would direct central banks to seek some kind of endorsement before embarking on a course of action that they believed was within the law but beyond anything that might have been contemplated when the extant regime was framed. Depending in part on local norms and conventions, that might entail consulting their legislature or executive government, or it might be pursued by raising the issues for public debate. If not actively blocked, the central bank might infer some kind of tacit consent.

There is much more to be said about this, but my focus here is on principles for making regimes more substantively complete and, given that can never be enough, procedurally complete. Only by designing regimes with 'emergencies' in mind can it be clear when express consent from elected politicians is necessary and who is responsible for deciding whether or not to grant the consent.

Section C: General principles for central bank balance-sheet policy

After that extensive scene setting, I am now set to sum up the somewhat fraught issue of how to go about determining the range of balance sheet operations that a central bank might legitimately pursue.

As will be clear from Section B, some of this will be locally specific, reflecting a society's particular norms and beliefs about the proper scope and modalities of democratic governance. But, in the field of central banking, there are economic forces towards convergence in institutional design. Jurisdictions have an instrumental interest in outsiders believing that their central bank is *truly* independent, since otherwise a risk premium is liable to be reflected in their exchange rate and in the cost of external financing. Crudely, if democratic-country A allows its central bank to undertake activities that would be unconscionable to the democratic values of its peers, there is liable to be scepticism about whether its central bank is, in fact, as independent as it makes out. For that reason, I concentrate in what follows on a generic advanced-economy-democracy central bank[9].

Given our first *Design Precept* for *how* to delegate, the legislature needs to lay down the purposes and monitorable objective(s) of the central bank. I shall not get far into that in this paper, other than to argue that, if a polity permits fractional-reserve banking, delivering monetary stability entails ensuring banking stability.

So, to get down to business, I want to argue, first, that central banks are not independent just as a matter of instrumental expedience, solely as a means to improving the effectiveness of policy, vitally important though that is to socioeconomic welfare. In a fiat-money system, independence is a corollary of the high-level separation of powers in our democracies between executive government and legislative fiscal authority: the executive branch should not control monetary policy because that would give them the power to tax without the authorization of the legislature. In other words, management of a state's consolidated balance sheet is partly delegated to its central bank in order to underpin the values of democracy itself. As put, that does not demand more than the minimum conception of central bank operations outlined above.

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[9] An exception to such convergence would arise in circumstances where the citizens of County C believe that most other democratic countries have different values and, thus, might, without compromising independence, permit their central bank to undertake activities that would cross a line in Country C itself. It is possible that some Germans might regard other G7 countries in that way, without doubting the independence from day-to-day politics of, say, the Fed. Separately, there could be short-term divergences amongst regimes where a country (its political community or just the central bank itself) was prepared to take more risks with legitimacy than its peers could tolerate. That might well have occurred during the crisis, but such short-term divergences create precisely the longer-term risks that, in this essay, I am assuming are liable to erode trust in the system of democratic governance.

But in the presence of fractional-reserve banking, price stability is an incomplete specification of the economy's need for monetary stability. It also needs stability in the banking system (understood as private issuers and providers of monetary liabilities and services). As the issuer of an economy's final-settlement asset (money), this gives the central bank an unavoidable role as lender of last resort: as liquidity reinsurer to those private sector intermediaries that provide liquidity insurance to the rest of the economy. In consequence, the central bank's balance sheet can never be the pristine thing that purists purport to desire or that the minimalist conception assumes.

Nevertheless, constraints are needed on central banks deploying their power in specific markets or in specific ways if they are to stay on the 'right side' of a blurred line between monetary policy and fiscal policy. I put 'right side' in quotes because this is a matter of convention. It does not find its roots in natural law or some inalienable essence of central banking. Rather each society has to determine where the line should be drawn, with our democratic values entailing that the convention should be open, comprehensible, and enforceable.

In consequence, the political purpose of general principles on balance-sheet management is to forge, establish or formalize the convention that a polity wishes to adopt. My suggestion in the previous section is that those choices should be thought of as being themselves constrained by more general *Principles for Delegation* to independent agencies. What follows is where those *Principles* seem, to me, to lead for central banking.

Following that same first *Design Precept*, a central bank's powers and constraints should also be laid down by elected politicians. The issues on which the rubber hits the road for balance-sheet policy are: how much risk should a central bank be permitted to take; and should it be allowed to steer the allocation of resources? It is those choices that define the *ex ante* boundary between the realm of central bankers and the realm of fiscal policy makers. I call this the *Fiscal Carve Out*.

A jurisdiction's *Fiscal Carve Out* (*FCO*) for its central bank needs to cover: the kind of assets it can lend against; the kind of assets it can buy, in what circumstances, for which of its purposes, and whether subject to consultation with the executive government or legislature; how losses will be covered by the fiscal authority, and how they will be communicated to government and legislature.

It seems to me that if legitimacy is to be given weight, as I believe it should if the extraordinary power of central banks is to be sustainable, we should want the *FCO* to reflect two principles: that central banks should have to (a) minimize risk to their capital, and (b) minimize operations that, relative to normal conditions, favour or incentivise the allocation of resources to particular sectors, regions, individuals or businesses.

Moving on, under our second *Design Precept*, it would be essential to have mandated processes for exercising any permitted degrees of discretionary decision-making on balance-sheet operations. Whether or not those decisions were for monetary policy makers would depend upon whether they were directed to the goals of monetary policy. If they were designed to mitigate threats to financial stability then, under the multiple-mission principles, they would instead properly be for the separate committee charged with preserving stability.

Separately, it would be necessary to establish whether any coordination with executive government was warranted. Where it was, it would need to be pre-programmed via the mandate or held over for emergencies (see below). Otherwise, the benefits of credible commitment would be diluted, if not surrendered.

Given our third and fourth *Design Precepts*, central banks should both adopt and publicly articulate a principle of 'instrument parsimony', meaning that they should conduct the most vanilla set of operations consistent with achieving their objectives. The purpose here is to help the public and the legislature monitor what central banks are doing with their balance sheets. Easier, I would suggest, for legislative overseers routinely to ask the central bank to explain why it has changed its short-term interest rate (and possibly, as discussed in Section E, a macro-prudential regulatory lever) than to have to make sense of why it is intervening in a whole range of financial markets to influence term premia, liquidity premia, and credit-risk premia. So I favour central banks using the fewest instruments consistent with achieving their objectives and given the constraints imposed by the frictions and imperfections in the real world they seek to influence.

In practice, that entails a highly parsimonious approach when short-term interest rates are above the effective lower bound (ELB). But while this principle is particularly apposite for normal circumstances ('peacetime'), it should apply all of the time.

While it was more than tolerable for central banks to become innovators during 2007/09 as the circumstances had not been foreseen and there was an imperative of shielding the public from a repeat of the Great Depression, the sequential unrolling of multiple, experimental acronymed programmes can and should be avoided if *similar* conditions arise again. Subject to where any particular jurisdiction decides that its *Fiscal Carve Out* constraints should bind, central banks ought now to know enough to use the minimum number of such programmes to meet the challenge presented by such conditions[10]. This takes us to the implications of the vital fifth *Design Precept* on emergencies, defined as circumstances where the *ex ante* regime has run out of road.

The *Emergencies Design Precept* requires the central banking regime to incorporate, subject to the *FCO* constraints, (a) substantive contingency plans for the widest possible range of eventualities, together with (b) agreed procedures for how the legitimate scope of central bank operations will be determined when those prior contingency plans are exhausted. A key question here is how far

[10] For example, the Bank of England would not need to reinvent something like the March 2008-launched Special Liquidity Scheme (SLS), because since the autumn of 2008 it has been committed to lending, against a wide range of collateral, via a Discount Window Facility and longer-term repos. The SLS was an innovation to plug a serious gap that no longer exists in the BofE's standard regime.

elected politicians should be involved. As discussed in the next Section, this principle is salient even in the case of the most vanilla form of quantitative easing: buying long-term government bonds after the policy rate has reached the *de facto* ZLB. But two constraints on emergency boundary extensions are, I would suggest, obvious and essential.

Whatever any such extension, a central bank should remain constrained by (i) its purposes, and (ii) the imperative of its not lending to or transferring resources to an institution that is fundamentally, irretrievably insolvent[11].

General principles for balance-sheet management

Summing up the sentiments of this Section, I am proposing the following as general principles to guide debates on central bank balance-sheet regimes:

A. Each central bank should have clear purposes, powers and constraints for its balance-sheet operations. The constraints comprise a *Fiscal Carve Out* specifying where the dividing line between independent central bankers and elected fiscal policy makers should lie.
B. Central bank balance-sheet operations should at all times be as parsimonious as possible consistent with achieving their objectives, in order to aid comprehensibility and accountability.
C. Within the *FCO* constraints, central banks should, further, minimize risk of loss consistent with achieving their statutory objectives.
D. *If* they are permitted to operate in private-sector paper in order to stimulate aggregate demand, they should operate in as wide a class of

[11] The rule of "no lending to fundamentally insolvent counterparties" is set out and defended in Tucker (2014), BIS, *op cit*.

paper as possible and the selection of individual instruments should be as formulaic as possible, in order to avoid the central bank making detailed choices about the allocation of credit to borrowers in the real economy.

E. Central banks should draw up and publish comprehensive contingency plans for the pursuit of their objectives, within their mandated and, in particular, *FCO* constraints. Those plans should pre-programme any coordination with other parts of government that control material parts of the consolidated state balance sheet (eg government debt managers), so that a back door is not opened up to political control of policy intended to be delegated to the central bank.
F. Where it is not clear what would happen at the boundary of their normal powers, central banks should publicly urge that elected politicians make those boundaries absolutely binding or, alternatively, provide procedural clarity for how they would take decisions to adjust the boundaries. Any such politically endorsed within-emergency extensions should be bindingly constrained by the purposes of the central bank and the imperative of not providing equity support.

Before turning to the substance, I would underline that that last general principle entails that, *if* provided for at all, it is elected politicians who decide whether to broaden the scope of their central bank's operational discretion in an emergency, not the judges. One set of unelected high-officials (the judges) cannot remedy the democratic deficit in another set of unelected officials (the central bankers).

As I see it, the operational independence of independent central banks would be preserved *within* any new in-emergency boundaries set by the politicians, who would be constrained by *ex ante* purposes and their accountability to the public. If central bankers oppose such in-emergency extensions, I think they must instead favour the initial set of constraints being completely binding. If, on the other hand, they were to look to the courts to move the boundaries, something very odd indeed would be going on[12].

Section D: Applying the balance-sheet management principles to vanilla policies

So where do these general principles take us for particular types of balance sheet operations, with the seemingly endless acronyms that began with QE, CE and MMLR? This and the next section address that question for operations intended to stimulate aggregate demand or restrain stability-threatening exuberance, which in the interests of space leaves out liquidity-reinsurance facilities. Rather than organizing the discussion by purpose, it is structured around whether or not an operation entails transactions in private sector paper. This section covers quantitative easing (QE), intervening in government-bond repo markets, operationalizing negative interest rates, and 'helicopter money'.

1) *Quantitative easing and government debt management*

The most vanilla operation is quantitative easing, which involves the central bank buying long-term government bonds, with the dual purpose of injecting money into the economy and of lowering long-bond yields.

[12] That is distinguishable from central banks standing ready to defend their view of a particular set of delegated authorities in the face of legal challenge. These are treacherous waters analytically, because one wants to say that a reasonable interpretation by a central bank of their powers should carry great weight if supported by elected governments. But, as I have outlined elsewhere, politicians have strategic incentives to go along with a wide construction of central bank powers in order to avoid taking difficult decisions to act themselves. That places a great burden on the courts, and is another, different reason, why well-defined regimes are so important. See the last section of Tucker Paul (2016), "The pressing need for more complete central bank policy regimes" in Caruana J., Kay J. and Tucker P. "Towards a 'new normal' in financial markets?", BIS paper, forthcoming (http://www.bis.org/events/conf150626/tucker.pdf).

Although, in terms of authority, QE relies upon no more than the central bank's right to create money in order to pursue is mandated nominal objective without taking credit risk, it does entail a small departure from the minimalist conception of central banking described in Section A. In terms of the state's consolidated balance sheet, it is equivalent to a combination of two operations: (i) the central bank buys Treasury Bills; (ii) the government adjusts the structure of its debt by buying-in long-term bonds and financing the purchase by issuing short-term bills.

Whilst most jurisdictions are comfortable delegating power to the central bank to undertake QE, the unbundling highlights three points about QE.

First, the compound operation, QE, serves a direct policy purpose only when money and Treasury Bills have become extraordinarily close substitutes or, put another way, when standard policy is constrained by the effective 'zero' lower bound. In those circumstances, the second leg, (ii), needs to be under the control of an independent monetary authority in order to mitigate the hazards of time-inconsistency and political incentives. That fits with our balance-sheet principle of parsimony (B in the previous section).

Second, the compound operation entails risk as (ii) might be unwound in conditions where longer-yields have risen. Of course, any losses to the state (and so to households) might be more than offset if the operation revives aggregate demand, and so improves the public finances, but that just underlines that embarking upon QE entails a risk assessment.

Third, government debt managers can offset some of the effects of the central bank's policy choices and actions. QE works via preferred-habitat effects on term premia and, perhaps, signaling the expected path of the short-term policy rate. The debt manager cannot convey signals about the likely path of the central bank's policy rate, but they can act on term premia by lengthening the maturity (or duration) of central government debt issuance, ie by changing debt-management strategy. Indeed, they have a narrow incentive to do so in order to lock-in unusually cheap funding costs. Remarkably, it seems that just that happened in the United States[13].

In the United Kingdom, the authorities recognized that co-ordination was needed, and before QE commenced in early 2009 the Bank of England agreed with the Treasury, via a published exchange of letters, that (a) the government would indemnify the Bank against any losses incurred upon later selling gilts back into the market; and (b) they would not change their debt management strategy, which had been sufficiently stable for innovations to be identifiable by market experts and Parliament[14].

The big point here is that once the composition of the state's consolidated (net) government/central bank balance sheet is being materially affected, in this case on the liabilities side, by the central bank's choice of what assets to operate in, a degree of explicit co-operation and co-ordination is unavoidable if overall policy is to be coherent. For the reasons set out in previous sections, that coordination is best delivered through the terms of the *ex ante* regime.

This need not create a reflex alarm about encroachments on monetary independence, in violation of the executive branch/legislature separation of powers and undermining the objective of credible commitment. The key determinant of whether independence --- insulation from day-to-day politics --- is being compromised is who decides the amount of money injected into the economy (or, more broadly, the stance of monetary policy and whether it remains

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[13] This is documented by HKS MPP-candidate Joshua S Randolph in "The interaction between government debt management and monetary policy: a call to develop a debt-maturity framework for the zero lower bound", 2014. This was later elaborated upon in Robin Greenwood, Samuel G. Hanson, Joshua S. Rudolph and Lawrence H. Summers "Government Debt Management at the Zero Lower Bound", Hutchins Center Working Papers | Number 5 of 18, September 30, 2014, available at http://www.brookings.edu/research/papers/2014/09/30 government debt-management-zero-lower-bound. The published explanation-cum-defence by the discussants at the Brookings event leave me somewhat baffled and bemused.

[14] The letters between Mervyn King and Alastair Darling are dated 17 February and 3March 2009. Darling's concluded "... the Government will not alter its issuance strategy as a result of asset transactions undertaken by the Bank of England for monetary policy purposes."

directed at achieving price stability)[15]. That the central bank is still in charge of monetary policy is more readily conveyed to public, markets and Parliament if the need for co-ordination with government has been countenanced and telegraphed in advance. Failure to do so invites confusion, and thus inadvertently gnaws away at legitimacy. In the UK, the need for such co-ordination in the then hypothetical circumstances of hitting the ZLB had been flagged by the Bank in speeches a few years earlier[16].

For the purposes of this paper, the implication is that, going forward, if QE is to be permitted, the terms of coordination with government should be made clear. That much is required by our first and second *Design Precepts*.

2) *Meeting excess demand for safe assets*

That first example was straightforward. There was no change in the broad purposes or specific objectives of the monetary authority, only an unfamiliar need for coordination with government debt managers and a heightened emphasis on making clear to the public how they are affected by central bank profits and losses. In the next few examples, we will confront questions about purposes, monitorable objectives, and the allocation of quasi-fiscal powers.

In Section A, I mentioned Jeremy Stein's proposal that, even under normal monetary conditions --- which is to say, with expected inflation in line with the target and with the ZLB out of sight --- the Fed might usefully hang on to a material chunk of its portfolio of Treasury bonds with a view to repo-ing them out at short maturities[17]. This would increase the net supply to the market of safe

[15] M A King, speech to South Wales Chamber of Commerce, Bank of England, 2012.
[16] Mervyn King, "The institutions of monetary policy. The Ely Lecture 2004", Bank of England; and Tucker, "Managing the central bank's balance sheet: where monetary policy meets financial stability", Bank of England 2004.

[17] See Mark Carlson, Burcu Duygan-Bump, Fabio Natalucci, Bill Nelson, Marcelo Ochoa, Jeremy Stein, and Skander Van den Heuvel, "The Demand for Short-Term, Safe Assets and Financial Stability: Some Evidence and Implications for Central Bank Policies", Federal Reserve Board published paper, January 2016.

assets, since there would be no duration risk as well as, in common with long-maturity Treasuries, next to no credit risk[18].

Although repo is the modern central bank's standard form of open market operation, the purpose here would be novel. Rather than being to ensure that the supply of reserves meets demand at the chosen policy rate in order to deliver an inflation target --- price stability --- the broad purpose would be to maintain financial stability. Thus, in terms of our balance-sheet-management principles, the central bank would maintain parsimony only given wider objectives for *routine* operations.

Specifically, the aim would be to avoid excess demand in the market for safe assets leading to supposedly 'safe' assets being synthesized from unsafe building blocks. It has been argued, with some plausibility, that one key driver of asset-backed security (ABS) issuance in the run up to the 2007/08 phase of the crisis was to meet excess demand from the non-bank financial sector for safe assets in circumstances where emerging-market economy central banks had become massive holders of US Treasuries and other reserve assets. Risky ABS were turned into supposedly riskless assets in two ways: by tranching and by using them as collateral in secured money market transactions. It didn't turn out very well.

Since the crisis, the advanced-economy central banks have, on one view, reduced the net supply of safe assets available to *non-banks* through their QE purchases of government bonds, as the non-banks receive risky bank deposits in payment. Stein and others worry that any consequent shortage of safe assets could have the perverse effect of endangering stability by prompting a new round of private sector creation of pseudo-money-like liabilities. Expansions in shadow banking activity can be thought about in this way.

For my purposes, there are two reasons to highlight this proposal. As a matter of mechanics, governments could themselves do what Stein suggests. And as a

[18] I am regarding only short-term instruments as safe.

matter of purposes, it rests on the central bank having a mandate to operate in markets routinely for financial-stability ends, not only to maintain the nominal anchor and to stabilize fluctuations in aggregate demand and output.

On the mechanics, such repos would shorten the maturity profile of the state's consolidated (ie, net) liabilities. Government could do that much more straightforwardly by issuing more Bills and fewer long-term Bonds. In other words, the central bank's repos would be a form of government debt management, outside the hands of the government debt managers.

The main reason a debt manager would not want to do what Stein suggests --- even for the world's dominant reserve currency issuer --- is roll over risk. When, in the 1990s, I was involved in UK debt management, my HMT opposite number (Jon Cunliffe) and I were clear in advising government to choose a debt portfolio with a long average maturity and broadly spread maturities in order, amongst other things, to avoid roll over risk. (This strategy delivered its benefits over a decade later, during the crisis.)

But Stein's plan does *not* entail roll over risk, because the government's underlying obligations remain long term. So, in fact, although strikingly similar to issuing Tbills, the mechanics of Stein's proposal deliver a subtly different economic bundle.

In principle, however, it would be open to government itself to make this maturity switch by carrying out each step of the compound operation. It could issue long-term Treasuries, buy some back, and then repo them out. At least initially, the effect on the consolidated balance sheet is identical. But it is not certain to remain so, and so may generate different forward-looking expectations. The argument varies slightly according to whether the initial buy-in of longer bonds is intended to be temporary or a part of the steady-state regime, the former being the analogue to the current QE-swollen central bank balance sheets. In that case,

- It is not clear why or under what conditions the debt manager would be committed to reselling the underlying long bonds to the market, whereas an orthodox central bank will do so when it needs to unwind QE in order to reduce the degree of monetary stimulus.
- If the debt manager's repo counterparties chose to let repos roll off, the debt manager could be faced with a choice of (a) selling the underlying bonds to the market, (b) expanding TBill issuance or, if permitted under the law, (c) borrowing from the central bank in order to meet its obligations.

This reminds us of (i) the *purpose* of the initial QE purchases of government bonds and, therefore, of (ii) the political-economy motivation of delegation to the central bank, which is credible commitment. Crudely, having government undertake the same bundle of transactions --- buy-in long bonds, repo out those bonds --- would be exposed to the hazard of the debt manager maintaining a short-duration (net) debt portfolio for too long, because government likes the *de facto* loosening in monetary conditions it brings. But there is also a second hazard, where the government is tempted to suspend its repos in order to allow a shortage of safe assets to take hold.

This is more easily illustrated in the case where the operations are part of the steady-state regime. In that case, in order to meet demand for safe assets, government is in effect committed to raising more money than it needs to cover its deficit and so need not be bothered about roll-over risk. In consequence, it can avoid the operational complexity of the three-legged compound transaction: it can simply issue TBills when it thinks a demand for safe assets is starting to threaten stability through the alchemy of ABS-repo or whatever. But could we rely upon government to do so? Mightn't government be tempted to sit on its hands, in order to incentivize a loosening of credit conditions via the creation of synthentic pseudo-safe but in reality risky securities?

In other words, credible commitment is as important to Stein's financial stability purpose as it is to monetary policy (and its associated operations). Seen like that, the question becomes whether, in compliance with our first *Design Precept*, it is possible to frame not only a broad purpose but also a monitorable objective for the repo operations Stein proposes. It seems plausible in principle that such operations could do good. But would it be possible to tell, even in broad terms, whether the central bank had done too much (over-supplied safe assets) or too little (under supplied)? While the central bank could target the spread between its policy rate and short-term government-repo rates, we would need to have a reasonable idea of how that spread influenced the creation of synthetic 'safe' assets, leverage in the system, etc. Otherwise, discretionary power would be granted without our being able to evaluate, under our fourth *Design Precept*, whether (a) the regime was a good one and, separately, (b) whether the central bank's stewardship of the regime was sufficiently adequate.

Those questions seem to me to be worth pursuing, partly because Stein's proposal has a political economy feature that distinguishes it from the deployment of regulatory tools to maintain stability: speed. At a higher level, there is some attraction in rooting central bank responsibilities for stability in the management of their balance sheets, in order to achieve a degree of separation from the 'regulatory state' and its baggage, in some jurisdictions, of interest-group bargaining.

For central bankers, however, the proposal also requires an answer to the question of whether it matters that reserves would be withdrawn via the repos. I would not expect that question to get much traction in the US where interest in 'money' amongst mainstream economists has been in decline over recent decades. But elsewhere I suspect people would want to think it through, especially for conditions where the policy rate was away from the ZLB.

Technically, it would amount to electing to implement monetary policy by remunerating 'excess reserves' at the policy rate, with reserve requirements set beyond banking system demand in order to deliver a balance sheet of a size that enabled stability-oriented repo operations to meet demand for safe assets outside the banking sector[19].

3) *Negative interest rates: marginality, and the political economy of wealth transfers to banks*

Back to monetary policy: still with vanilla balance sheets in terms of asset composition but with awkward questions about legitimate purposes and legitimating processes.

As the years since the 2008/09 phase of the crisis have passed, some central banks have moved on to setting a negative policy interest rate. The purpose is, in most cases, to sustain stimulus to nominal demand under conditions where the unobservable equilibrium risk-free real rate of interest is widely believed to be negative in some currency areas.

A lot could be said about that, but my interest here is the way in which this policy has been implemented in those currency areas where the banking system holds large balances with the central banks (due either to a regime of reserve requirements or large outstanding purchases of assets). In some such jurisdictions, the central bank has set a negative rate on the last few units of reserves but continues to remunerate the general mass of reserves at a small positive rate or zero. It has been widely commented that maintaining a positive rate for the mass of reserves is designed to protect the banks and 'so' avoid pass through of the negative rate to retail deposit and loan contracts. The 'so' is in quotes because, as put, this is a bit confusing.

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[19] If the monetary framework replied upon reserves being supplied in line with banking system demand, it would matter that the stability-motivated repos would drain reserves from the system. In consequence, in order to avoid a tightening in monetary conditions, the central bank would need to recycle the reserves in order to keep its net supply in line with demand. Since it would perverse for it to do so by buying safe assets, it would be constrained to buy or repo-in risky assets, which is the subject of the next section.

In terms of monetary policy, it is the marginal rate that matters. If maintained, it would very likely in time be transmitted through to *both* wholesale and retail rates[20]. Once we see that the equilibrium structure of rates is driven to be negative, it is clearer that paying a positive rate on the mass of reserves constitutes a transfer of wealth to the banks. The motive might or might not have merit. I imagine that it is driven by a concern that if it takes time for the negative marginal rate to be passed through to retail deposits, then a negative rate on all reserves would impose losses on the banks, which in terms of public welfare would be a bad thing if it caused a contraction in the supply of credit to the real economy[21]. In other words, during that transitional period, the authorities face a choice between the banks suffering losses and the central bank covering those losses itself.

Irrespective of one's views on the merits or demerits of the policy, it is clear that paying a positive rate of interest on the bulk of reserves is, in public finance terms, a tax policy and a distributional policy. Such policies are generally reserved to the fiscal authorities.

Indeed, one could think of the policy package I have described as the equivalent of (i) a negative rate being paid by the central bank on all reserves; and (ii) a transfer from the government to banks that is equivalent to their receiving a small positive rate on the bulk of their reserves. But then how does government finance that fiscal transfer? The answer is that, under that package, it receives higher seigniorage income from the central bank than under the real world policy, which entails losses for the central bank and lower transfers to government.

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[20] Imagine that wholesale rates are persistently negative but retail deposit rates are positive: there would be a massive shift into deposits earning the positive rate! Steve Cecchetti and Kim Schoenholtz discuss this in their blog: http://www.moneyandbanking.com/commentary/2016/2/28/how-low-can-they-go

[21] The credit contraction would tend to drive down the short-term equilibrium rate, making it even more negative. Another possible motive for paying interest on the bulk of reserves would be a desire to avoid negative rates affecting ordinary people. That is a view that is sustainable only if a central bank thought that a negative marginal rate would be short-lived, but it is hard to see how anyone could be confident of that.

In terms of our *Principles for Delegation*, the question is who should be the decision taker for this transfer-cum-tax policy. The answer, under the first and fifth *Design Precepts*, is that (a) now the matter has been identified, in *steady state* it should be covered, one way or another, in the mandate and in the *Fiscal Carve Out* that draws boundaries around a central bank's discretionary latitude; and (b) that where it was not anticipated in the existing *ex ante* regime, it should be blessed by the fiscal policy maker before being applied.

This prescription amounts to no more than saying that just as central banks needed to consult before they moved to paying interest on reserves, since that lifted a tax, they need to do so before they introduce a subsidy.

4) *Helicopter money: sending money to citizens*

The idea of 'helicopter money' might be thought to be very different from negative policy rates, but in political economy terms it has some similarities.

There are three broad variants of the idea:

I. The central bank provides monetary financing to government, but decides itself how much and on what terms.
II. The central bank is obliged to provide monetary financing in whatever amount and on whatever terms the government wishes.
III. The central bank sends money directly to the people.

The first might seem to be akin, in some respects, to QE, but the financing is permanent, and the operation is not implemented through secondary markets. The second entails the suspension of central bank independence, which should be made clear if democratic values and the rule of law are to be upheld. But the third seems different, as a decision is needed on how much money to send each citizen or household.

On the question of who should receive the money, should it be: all households, all taxpayers, all resident taxpayers, only those in work, or what? On how much, should it be: the same lump sum to all, or a flat percentage of income, or a flat percentage of wealth, or a percentage that increases with (estimates of) the marginal propensity to consume, or a percentage that increases with regional rates of unemployment.

And guess what that looks like: tax policy! To choose how much to pay to whom is to choose a tax policy. So, in terms of the questions I am interested in here, it seems that the policy must entail either the suspension of central bank independence or, alternatively, the transfer of fiscal power to the central bank.

The latter, of course, would amount to the maximalist conception of central banking identified in Section A. In more familiar terms, if democracy matters at all, it would constitute a *coup d'etat*, albeit one in which the higher reaches of the state might be complicit in a stunning abrogation of powers. A formalized version, giving it a veneer of legitimacy, would be legislation temporarily bestowing such power on the central bank --- rather like when the Romans elected a temporary dictator to help meet an emergency.

One obvious possible solution would be to split the operation into two parts. An independent central bank would decide how much money to create in pursuit of its inflation target, and the fiscal authority would decide how to distribute the money. This would restore the structure of money-financed fiscal expenditure that is more familiar from history. But precisely because of the lessons of history, it underlines that, if anything like nominal credibility is to be sustained, the central bank should not only be confined to the money-creation choice, it must be free to make that choice independently. Whether any such money was used to reduce taxes or build infrastructure or to send money-parcels to people would be for elected representations, reflecting their view of whether the supply side of the economy needed to be enhanced in addition to any desired demand stimulus.

That points to a need for broad agreement between central bank and government that fiscal expansion is warranted. Most starkly, for a central bank unilaterally to embark upon 'helicopter money' when government was committed to fiscal contraction would be for unelected technocrats to override the elected government's choices. Any such deep disagreement requires public debate, and therefore transparency.

This helps to highlight an oddity in contemporary debate about 'helicopter money'. A polity with fiscal space could adopt a debt-financed fiscal expansion. Many commentators believe that this would be preferable to relying entirely on monetary policy to support recovery since, as well as injecting demand, it could be used to improve the economy's productive capacity; and, separately, it would tend to put upward pressure on longer-term interest rates, reducing risks to financial stability from the stability-threatening 'search for yield' liable to fostered by persistently easy monetary conditions. These are very big and pressing issues, over which historians might agonize and a future generation weep. But my interest here is different. It is that if money-financed fiscal policy were adopted before a debt-financed expansion, a very strange signal would be given about the functioning of our legislatures and/or about perceptions of the sustainability of the public finances.

The past few subsections have been designed to reveal how important and sometimes complex political economy questions are posed by central bank balance-sheet operations even when purchases of private-sector assets are not involved. In the next and final section, we turn to 'credit policy', which in some ways presents more intricate challenges.

Section E: Applying the balance sheet management principles to credit policy

Should central banks be permitted to intervene in individual private-sector bond and loan markets, and to what ends? In discussing some of these issues, Marvin Goodfriend has argued that getting into credit policy undermines the very idea of an independent central bank[22].

1) *The problem*

And yet, as the 'only game in town', it is where central banks have been most adventurous and innovative over the past half a dozen years.

At an early stage of the crisis, some central banks, including the Fed and the Bank of England, intervened in private-sector paper markets in order to sustain liquidity as dealers withdrew due to capital constraints[23]. In other words, they substituted themselves as intermediaries when private capital markets threatened to dry up completely. Other than to say that, if they are permitted at all, such Market Maker of Last Resort (MMLR) operations need to be constrained by a regime, I am not going to dwell on them here. Like credit-easing purchases, they entail outright risk, but their purpose aligns them more with standard LOLR assistance. As such, they form part of a wider potential liquidity-reinsurance function that only the monetary authority can deliver and which, if approved, needs a general

[22] Marvin Goodfriend, "The elusive promise of independent central banking", Institute for Monetary and Economic Studies, Bank of Japan, Tokyo, 2012. See also Robert L Hetzel, Federal Reserve Bank of Richmond, "The distinctions between credit, monetary and liquidity policy", now chapter 14 of "The Great Recession: market failure or policy failure?" 2012.

[23] Tucker, 2009, "The repertoire of official sector interventions in the financial system: last resort lending, market-making and capital", presentation at the Bank of Japan 2009 International Conference: Financial System and Monetary Policy Implementation: Bank of England.

framework that spans a central bank's price stability and financial-system stability core purposes[24].

Instead, my main focus here is on credit-market interventions that are intended directly to affect credit supply. Over the past few years, such operations have been designed to stimulate spending in the economy by reducing the cost of credit in sectors or regions where risk premia would otherwise have choked off demand.

Taken as a community, central banks have both lent against (repoed) securities issued or backed by claims on private sector borrowers, and in some instances purchased them outright. Since some central banks were set against outright purchases, the differences with repo warrant a little exploration.

2) *Repo is preferable to outright purchases*

Compared with outright purchases, standard repos avoid important political economy hazards. Under repo, the central bank effectively finances outright purchases by private sector firms and funds, who are typically free to substitute fresh collateral within the eligible pool during the term of the repo. It is, therefore, those private sector actors who make the choices between individual issuers/portfolio bundles, and thus allocate credit.

In terms of exposure to risk of loss, the distinction is even starker. An outright purchase is a one-shot game. If the price falls after the central bank's purchase or if the issuer defaults before maturity, the state suffers a loss. A standard repo is the opposite of a one-shot game. Each and every day (or more frequently if needs be), the central bank can revalue the collateral, require a top-up if it has fallen in

[24] Possible principles for MMLR operations are set out in Tucker (2009), *ibid*; and were later refined, after leaving office, in Tucker (2014), *op cit*.

value, and revise its requirement for excess collateral (its haircut) if any of the world, the market in the collateral or its counterparty have become riskier.

Further, the central bank can remove instruments from the pool of eligible collateral, and may demand that its counterparties substitute different instruments during the term of a repo[25].

Under Section C's general principles for balance sheet management, it is better, therefore, to stick to long-term repos against baskets of diversified portfolios of private sector securities ahead of contemplating outright purchases.

Further if the banking sector is unable to participate in repo operations because it is badly beaten up after asset impairments, it would be preferable for the central bank temporarily to widen the population of counterparties to intermediaries beyond banks than to resort to outright purchases. By changing its counterparties, the central bank's provision of financing is more likely to translate into increased underlying demand for the type of securities in question, sustain the functioning of private markets, and avoid fiscal transfers.

But repo is not always what it seems

Even for vanilla repos against wide collateral, this is not quite as straightforward as it might seem. If a central bank routinely conducts wide-collateral, medium-term maturity repo operations, in peacetime as well as during crises, it is in effect in the collateral-transformation business. The repos are economically equivalent to conducting open market-operations in low risk government bonds followed by

[25] It should be added that if a repo counterparty defaults, a central bank finds itself holding the underlying securities outright. An important risk-management constraint on repo collateral, therefore, is that a central bank should not lend against assets which it is not capable of holding and managing outright. Separately, I would add that outright purchases of some specific kinds of short-term private sector paper, for example the old bankers' acceptances, have some of the risk characteristics of repo.

a second operation that swaps the Treasuries for risky illiquid paper[26]. Soft terms (delivered through rich valuations or low haircuts), even if inadvertent, would amount to subsidising counterparties and/or issuers of the underlying paper.

Central banks should, therefore, be transparent about how they set haircuts and value securities, both as a disciplining device and to enable democratic scrutiny[27].

We should also observe that the dividing line with outright purchases can become blurred. For example, non-recourse repos are riskier than standard repos because the central bank does not have a claim on the counterparty. In the event of default, it is entirely reliant on the realizable value of the collateral covering its exposure. Whether that amounts to having made an outright purchase without the upside risk depends on whether it can reset its collateral requirements during the loan's life.

Away from risk management, the terms of repos can also be set so as to steer the allocation of credit. As containing the financial system's liquidity and solvency crisis was succeeded by the challenge of reviving economic activity, that was the aim of a number of central bank programmes, perhaps initiated by the Bank of England's *Funding for Lending Scheme*. The terms of that facility were designed to incentivize greater credit supply by charging a lower rate, the more *new* lending a counterparty extended to particular sectors. Precisely because this ventured into space more normally associated with fiscal policy makers, the terms were agreed with the UK Treasury. In effect, the Bank had the right of initiative and the Treasury of veto over the broad terms of the regime, and the Bank chose the amounts it would be prepared to lend in the light of its independent judgment of the amount of stimulus that was needed.

[26] More completely, it is a compound of three operations: (i) a 'minimalist central bank' purchase of Treasury Bills, (ii) a debt-management swap of TBills for longer-term government bonds; and (iii) a credit policy swap of those government bonds for private paper.

[27] The substance of that condition is driven by balance-sheet-management principle C, and the transparency required by delegation *Design Precepts* 3 and 4.

The general point is that wherever risk exceeds buying short-term Treasuries or credit is steered or subsidized, the standard distinctions between the latitude of central bankers and fiscal policy makers might be in question. That is most obvious for outright purchases. Without advocating such operations, we therefore need to see whether there are conditions that could usefully constrain them, since that is the balancing act that those authorizing central bank regimes need to undertake.

3) Pure credit policy: steering supply to stimulate aggregate demand

The prior question is why outright operations might ever be contemplated. One monetary policy reason might be to force the market to absorb a desired extra supply of reserves. Another possible reason would be to reduce the operational costs and risks of rolling over a very large portfolio of short-to-medium term repos. But both a reserves-supply and a reduce-portfolio-churn objective could be met by purchasing government bonds rather than private-sector paper.

Outright operations therefore need to be warranted by difficulties in otherwise achieving a policy objective. So far as price stability is concerned, an independent central bank should always find standard interest rate policy sufficient to restrain nominal demand. It may not always be sufficient to bring about recovery but, assuming a plentiful supply of low risk government paper in the market, vanilla QE can bring down the cost of credit in other markets through portfolio balance (preferred habitat) effects. Thus while the obvious motive for purchasing privately issued or backed securities is to drive down the cost of credit in the capital markets, this needs to be over and above what could be delivered, directly or indirectly, by reducing the expected path of risk-free rates and compressing term premia.

The following accordingly strike me as minimum substantive criteria for such outright purchases:

- the monetary policy rate is at the zero lower constraint[28];
- vanilla quantitative easing and forward guidance will not suffice, or entail even more unacceptable risks;
- repo operations in private-sector paper will not suffice, even where eligible counterparties are extended beyond banks and maturities have been extended.

In other words, I cannot see why outright purchases of risky paper would be contemplated before more regular central bank operations had been exhausted. (

Those are necessary not sufficient conditions. In the rare circumstances where they were satisfied, monetary and fiscal authority would, in some sense, start to become coterminous. So political-economy, or governance, criteria would also be needed, in advance.

One option would be for the fiscal authority to both decide and conduct the operations, with or without the advice of the central bank, whose monetary role would be limited to deciding whether to finance the purchases by buying government paper. Another option would be for the intervention to be explicitly on the fiscal authority's books, even if managed operationally by the central bank as agent. And a third would be for it to be undertaken on the central bank's initiative, on the central bank's books, but indemnified by government and subject to constraints set *ex ante* as part of a regime. More systemically, the key dimensions of choice are as follows:

- whether on the central bank's books or on a 'fiscal account'
- whether determined by the central bank or the fiscal authority
- if determined by the fiscal authority, whether on the exclusive initiative of the central bank

[28] See footnote 3.

- if on the fiscal authority's books, whether the monetary authority retains full autonomy as to whether to finance the purchases.

We are interested in the case where purchases are booked to the central bank's balance sheet. I want to suggest the following political economy criteria.

First, they should be booked to the central bank only if it has control of the operations and they are directed to achieving the central bank's statutory purpose and objectives. That is to say, within the terms of a regime agreed with elected politicians, it should make independent decisions on amounts, terms and timing: ie operational independence should apply. Alternatively, independence should be explicitly suspended by government with the consent of the legislature. There should be no pretending.

Second, having taken the plunge and again constrained by the terms of the regime, the central should operate in as wide a class of paper as possible. Making allocative decisions could all too easily erode its legitimacy amongst businesses and households when economic-peacetime was eventually restored. The Fed's purchases of MBS might not meet this test as, although within the law, they would seem to favour household credit over business credit (except in circumstances where there is a specific malfunction in household-mortgage markets). This is a problem of regime design. The relevant legislation permits purchases of government-guaranteed paper, but there are no Federal government-guaranteed business-loan securitizations. In terms of keeping the central bank away from subsidizing certain types of credit, it might be better if the statutory regime were either narrower or broader[29].

Third, it should be made clear publicly that any losses (or profits) would go the fiscal authority.

[29] To be clear, I am not advocating wider subsidies.

Fourth, the basis of central bank's pricing decisions should be transparent, so that it can be held accountable for any hidden subsidies that come to light later. If government wants to grant hidden subsidies, it can do so under its own authorities.

4) *Intervening in capital markets to restrain exuberant demand for credit*

As I have described them, operations in credit markets to steer aggregate demand in pursuit of an inflation (or other nominal) target have an asymmetric motive, reflecting the zero-lower-bound constraint on nominal interest rates. When it comes to credit market operations implementing financial stability policy, there might be asymmetry in the other direction.

Away from entrenched recessions, it seems unlikely that the authorities of an advanced economy would want to subsidize credit to particular sectors or regions for anything other than reasons of distributional justice (equity) or narrow political advantage. If so, such operations do not belong with an independent agency. But might such an authority want to *restrain* the flow of credit to particular sectors in order to contain threats to stability? Given that a number of jurisdictions have given their authorities the power temporarily to raise capital-risk weights on sectoral exposures, it would seem so. In that case, the question arises whether it would be preferable, or at least legitimate, for central banks to seek to achieve the same effect by intervening directly in capital markets. In contrast to the previous section, now the central bank would be a seller, trying to drive up credit spreads.

This is more or less the proposal aired by Ben Friedman which I mentioned, by way of scene setting, in Section A[30]. In political economy terms, on the one hand, like Jeremy Stein's Treasury-repo proposal, this has the apparent merit of locating the central bank's powers in its balance sheet, with transmission through market prices rather than through constraints on intermediaries or end-borrowers. And in efficiency terms, it might be effected more quickly than a temporary change in regulatory rules.

On the other hand, it is a fiscal operation of sorts. In order for sales to be feasible whenever warranted, it requires the central bank permanently to maintain portfolios of whichever asset classes it judges to be materially relevant to stability[31]. And, crucially, it relies upon trying to steer credit conditions rather than on measures that directly address the resilience of intermediaries.

That last point is especially important because it goes to a debate about whether the statutory objective of financial stability authorities should be to maintain a desired degree of resilience in the financial system as a whole or, alternatively, to manage the credit cycle.

I believe that the former is both more realistic and a more legitimate use of the state's powers[32]. In consequence, I start out with a preference for deploying macro-prudential tools, such as raising firms' capital or liquidity requirements, ahead of any direct intervention in markets.

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[30] Benjamin M. Friedman, "Has the financial crisis permanently changed the practice of monetary policy? Has it changed the theory of monetary policy?", *The Manchester School*, vol. 83, June, 2015. A version appeared in the *Financial Times*: http://www.ft.com/intl/cms/s/0/47e50644-ea63-11e3-8dde-00144feabdc0.html#axzz45oZS59P3

[31] I am assuming that the central bank would not adopt a policy framework that relied up going short and, thus, being able to borrow securities to deliver to its counterparties.

[32] Tucker, Paul, 2016, "Macro Prudential Policy Regimes: Definition and Institutional Implications," in Blanchard, Rajan, Rogoff, and Summers (editors) *Progress and Confusion: The State of Macroeconomic Policy*. International Monetary Fund and MIT Press (Cambridge Massachusetts).

But the important point here is not my own preference but, rather, that the advent of macro-prudential regimes makes us think about what we really want the authorities to achieve, and about the relative political-economy attractions and hazards of quasi-fiscal and quasi-regulatory interventions. As such, the choice of central bank balance-sheet strategies should be part of a wider debate about goals and modalities.

Conclusion

The points at the heart of this essay revolve around facing up to the potential reach of central banks' technical capacity, and ensuring that they are directed and constrained in ways that reconcile the exercise of discretionary power by unelected technocrats with our democratic values.

Central bank operations affect the size, structure and composition of the state's consolidated balance sheet. Recognizing that, the minimal conception of central banking wants to limit the role to maturity transformation of the state's liabilities, but it borders on the unrealistic by dispensing with a lender of last resort that incurs risk when seeking to mitigate the social costs of dysfunctional money markets. The maximalist conception casts the central bank as a reserve fiscal policy maker. That nobody advocates it is testament to broad and deep acceptance that, in a democracy, elected representatives make tax and spending decisions. Societies are, therefore, left with having to choose where in between central banking should lie. They can in principle step in to underpin the liquidity of markets or even, *if* society wishes, to steer the price of credit temporarily through weight of money. But should they? This amounts to having to balance the benefits of credible commitment against the costs of trespassing into the realm of social choice.

My answer is that a central bank's room for manoeuvre, the boundaries of its domain, should be set out in advance in a regime. I suggested that any such regime should be consistent with a set of *Principles for Delegation* to unelected power more generally, which includes catering (procedurally if not substantively) for emergencies. In conclusion, I want to add a few thoughts about objectives and the *Fiscal Carve Out*.

Objectives: deciding which social costs to prioritise and how

Our discussion of whether central banks should be permitted to intervene in asset markets highlighted the question of purpose: should it be solely to stimulate aggregate demand or might it extend to restraining stability-threatening exuberance? Behind that lie deeper questions that will have to be taken on if decent balance-sheet regimes are to be framed.

If, as orthodoxy now again holds, central banks have a mission to preserve financial stability as well as price stability, what is meant by 'financial stability'? Do we want them to focus their efforts on the social costs of a breakdown in financial intermediation brought about by distress amongst intermediaries? Or do we wish them also to mitigate the social costs of resource misallocation and over-indebtedness brought about by booms that do not end in a catastrophic bust?

Returning to the ideas aired by Stein and Friedman, in both cases a mission directed to allocative efficiency would require much more frequent interventions than a mission of preserving the resilience of the financial system itself.

Further, does the choice of mission affect whether the best set of policy instruments are regulatory or balance-sheet interventions? If, for example, the mission is system resilience, is it better to respond to unusual threats by making dynamic adjustments to core regulatory parameters (the 'counter-cyclical capital buffer') or by selling bonds to drive up the cost of credit directly?

I shall not remotely try to answer any of that here, but I want to underline that the question of whether to respond to exuberance with balance-sheet policy raises issues that go beyond resolving the repertoire of operations that should be available to central banks to steer nominal demand and to respond to monetary-system emergencies[33].

The Fiscal Carve-Out

Whatever the broad purposes of central bank functions, a lot of work is done in my proposed set up by the precept that society should take steps to pin down and make transparent the *Fiscal Carve Out* under which central banks operate[34].

On this view, the *form* of a central bank's 'capital' resources is important for reasons of political economy. At one end of the spectrum, the fiscal authority might give a formal blanket indemnity against loss, but also dictate the population of assets that is eligible in the central bank's operations and, thus at least indirectly, the scope and form of its market operations. At the other end of the spectrum, the central bank is given a pot of capital and a statement of purposes, and has freedom to choose the form and scope of its operations. There are myriad points in-between those poles. My point is that each society should know --- indeed, actively choose --- where it lies on that spectrum.

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[33] A discussion of the purposes of and techniques for preserving 'stability' is forthcoming in a paper to be published by CIGI.

[34] Marvin Goodfriend called for a clear regime for credit operations in 1994: "Why we need an 'Accord' for Federal Reserve credit policy". I suspect that Marvin and I might draw the lines in slightly different places, but we broadly agree on the significance of the high-level political economy issues, as we discussed when we were both staff officials during the 1990s.

In so choosing, two things are going on. A line is drawn between central banking decision makers and fiscal decision makers, which as a matter of convention (rather than essence) has the effect of implicitly defining what count as distinct 'monetary' and 'fiscal' spheres. That part of the choice can be thought of as being about values. The other part is about whether the posited instrumental benefits of delegation are secured.

Thus, if a central bank with no (or next to no) equity capital serves a society whose norms would permit government to extract a price if and when it incurred losses then, if it cares about sustaining the regime, it has incentives either to adopt a cautious policy or to seek facility-specific indemnities. The former could cause policy to undershoot what the framers intended, but the latter gives politicians levers over what was intended, ex ante, to be within the delegated domain. In a nutshell, the part of the central bank regime that covers risk and losses is especially important as it plays a large part in determining when a central bank reaches the edges of its normal mode of operation and enters the territory of 'emergencies'. For that reason, the financial-accounting conventions that apply to a central bank are important in political economy terms, and are not just a matter to be left to specialist technicians, because losses and profits flow through to citizens as users of public services and as taxpayers. The variety of accounting schemes around the world suggests that either local political conditions vary enormously or that this is a neglected area.

This helps to make clear, I hope, that calling for boundaries in a clear regime does not of itself entail that the boundaries must be narrow. Too often the call for boundaries is conflated with a preference for where the boundaries should be located. But on the other side of the debate, too often those who oppose tight constraints come across as favouring pretty much unconstrained discretion to do whatever is needed to save the world. The resulting perception has damaged central banks in some jurisdictions. Central banks are not the financial/economic equivalent of the US Cavalry; or if they wish to be, they should recall that the cavalry was, and remains, under civilian control. Hence my call that every part of central banking should be framed by a regime.

Some steps have been taken in the direction of articulating regimes. For example, since 2013, the Bank of England's monetary policy remit from the executive government contains provisions to the effect that where unconventional interventions in specific markets or activities have implications for credit allocation or for risk, governance arrangements must be agreed with government.

In the US, the Treasury and the Federal Reserve issued a Joint Statement in 2009 that had some features of a regime. Broadly, it provided that the Fed would avoid credit risk and credit allocation; that monetary stability should not be jeopardized by crisis measures; that they would urge Congress to introduce a comprehensive resolution regime for critical financial institutions; and, in what was in fact the first item in the list, that they would co-operate in managing the crisis[35]. But, so far as I know, that Joint Statement has not been updated. Technically, it needs to catch up with the 2010 Dodd-Frank legislation, which introduced a special resolution regime. And, on the view presented here, it *ought* to be updated in any case: there will be no dodging the need for co-operation when the next crisis hits, and so the *ex ante* boundaries should be visible[36].

Legislatures should oversee such arrangements between central banks and the executive branch, and there should be broad debate on their terms. That is not easy to get right.

Final reflections: 'common law' versus regime-based central banking

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[35] This makes the lack of coordination between QE and debt-management strategy all the more intriguing. More generally, the Joint Statement elicited little interest, the late Anna J Schwartz being one of the few people to analyse it: "Boundaries between the Fed and the Treasury", March 2009.

[36] That's not to say that nothing has been done. The same Dodd-Frank legislation makes clear when the Federal Reserve needs the consent of the executive government to conduct certain types of LOLR operation.

Readers will have observed what might seem like a personal preference for statutory regimes, fleshed out, under our third *Design Precept*, by central bank *Operating Principles*. I see this less as a personal preference than an observation of society's evolving preferences and standards for governance.

The point can be made by admitting to an elision in the previous section's discussion of Ben Friedman's proposal for state-contingent asset sales. Friedman's idea was limited to the MBS market, both because the Fed has a large MBS portfolio and because household-mortgage exuberance was at the heart of the 2007-09 phase of the crisis. Like Jeremy Stein in his proposal for Treasury repo-market interventions, Friedman was engaging with the pragmatic question of how the Fed could usefully employ its post-QE portfolios in the interests of stability. By contrast, I evaluated them as permanent regimes. I did that for a reason.

Once a central bank has undertaken a particular type of operation, there will be an expectation that it could or, stronger, would do so again in broadly similar circumstances. Central bankers are, therefore, in the business of creating, refining and sometimes overturning precedents. In other words, like common law judges, their choices and actions change the terms of trade within their (vast) sphere of influence and control. And just as we face a choice between how much of the law we wish to be made by judges and how much by elected legislatures, so we face a choice over whether we wish central bank practice and principles to remain latent in the precedents they create or, alternatively, to be transparent in *ex ante* regimes that are established by elected legislatures after due public debate and filled-out by central banks.

The burden of this paper is that, reflecting an evolution in standards of legitimacy during the latter part of the 20th century, we need to tilt the effort more towards the construction of regimes based on statute and independent agency operating principles. Whereas in Bagehot's day, precepts for the lender of last resort could be articulated by outside commentators seeking to pin down what they saw as useful parts of Bank of England practice during the 1860s, today that seems unlikely to be enough, not least given the need to *choose* where to draw the line in our full-franchise democracies between the arena of technocratic central bankers and the domain of elected representatives. It is hard to see how central bankers themselves could do that, or how judges could legitimately do it if central bank actions were challenged in the courts.

What I am advocating amounts to nor more, but no less, than balance-sheet policy catching up with the approach taken from the 1990s onwards to designing and legislating for effective and legitimate institutions for systematic monetary policy. In a nutshell, however unavoidable improvisation might be in the midst of crisis, it cannot today be sufficient for planning the future shape and uses of central bank balance sheets if central bank independence is to be sustained and supported. Too much has already been learned during the crisis for that opportunity to be passed over.