Scope and Limits of ECB Purchases: Does Central Bank Capital Matter?

By Michael Hart

- **The ECB's ability to act as an LOLR to sovereigns is constrained not only by its narrow mandate and EU Treaty provisions, but also by doubts about the credibility of its fiscal anchor and a potential unhinging of inflationary expectations. We examine how tight these constraints are in reality.**
- **A central bank can never become illiquid and can become insolvent only in the event of excessive index-linked or foreign currency-denominated liabilities. These are negligible in the ECB's case. What is more, temporarily negative capital does not hinder a central bank in its operations in any way. Only a *persistently* negative equity position would dent a central bank's credibility and independence.**
- **The negligible levels of capital (and provisions) among major central banks suggest that such "equity" does not currently play a critical role in determining central bank credibility or inflation expectations. While there is a (weak) case against unlimited interventions, the ECB has significant room for larger, riskier and more decisive asset purchases that could help stabilize markets.**
- **Specifically, we find that: 1) the ECB's asset purchases are currently the smallest of the five major central banks engaged in such actions, 2) even if the ECB boosted its purchases to €1.0 trillion, they would proportionately still be among the smallest of the central banks reviewed, 3) its balance sheet is the least encumbered by asset purchases, 4) the ECB maintains the highest capital and reserves relative to the economy bar Switzerland and 5) even if SMP purchases rose to €1.0 trillion, the ECB would still have the lowest "gearing ratio" outside of Switzerland. This holds even if the €600 billion-worth of bank liquidity support remain intact.**
- **The ECB is likely to "hold out" in any debt restructuring but, even if its capital and provisions were completely wiped out by a sovereign default and/or euro exit, it could call on additional capital from its creditworthy member states, operate in negative equity temporarily and rebuild its capital over time through seigniorage revenue and asset revaluation without a high risk of hyperinflation.**

Central banks in the G10 economies responded to the financial crisis that unfolded since 2008 with an unprecedented degree of monetary accommodation: After lowering official policy rates to near zero, they expanded their balance sheets by around 10% points of GDP (and as much as 44% points in Switzerland's case, Figure 1). These actions served a diverse set of purposes, ranging from the substitution of public for impaired private balance sheets, attempts to unclog the credit channel, revive the economy to policies supporting an exchange rate objective. All these operations had in common that they invested in assets perceived to be risk-free (sovereign) or were explicitly bought as hold-to-maturity investments when there was a credit risk (the Fed's RMBS purchases). The ECB's asset purchases are of a different nature as they were undertaken precisely at a time when concerns about sovereign creditworthiness were on the rise and the ECB's stated objective was to ensure the functioning of the monetary transmission mechanism.[1]

Issues Associated with Quantitative- and Credit Easing

The ECB now faces increasingly frenetic calls to act as a lender of last resort (LOLR), not in the traditional sense of providing liquidity to the banking system, against good collateral and at a penalty rate (Bagehot's dictum), but instead to wobbly sovereigns and at a preferential rate. This is of course a fundamentally

[1] The ECB argued that the SMP's aim was "to ensure depth and liquidity in those market segments which are dysfunctional. The objective of this programme is to address the malfunctioning of securities markets and restore an appropriate monetary policy transmission mechanism."

different proposition as it implies loading the ECB's balance sheet with a significant amount of credit risk and potential capital losses if Spain and Italy have to restructure their sovereign debt.

The ECB faces conceptual constraints in a way similar actions by other central banks do not. It is clear that a commitment to *unlimited* purchases of such securities violates various Treaty provisions, not least the prohibition against monetary financing, even if purchases are made on the secondary rather than the primary market. The primary reason for this provision is the threat of moral hazard for profligate governments and the deleterious consequences such policies have had in countless instances in history and across the world (i.e. run-away inflation and the systemic hollowing out of institutional credibility). Of course, a *credible* commitment to unlimited purchases could be very effective as market buyers of government securities could be safe in the knowledge of this "safety net" and continue to earn the "carry," i.e. the difference between the high yields offered on shaky government securities and the preferential ECB funding rate. But even *limited* purchases of assets could be problematic: Markets may doubt the credibility of such measures in the absence of a fiscal anchor that is itself solvent. It can argued that, in the UK and the U.S., the respective national treasuries could in theory redeem the entire central bank balance sheet as they can draw on the resources of the entire economy through taxation. The eurozone (EZ) faces a somewhat different situation: While the ECB is backed by the paid-in (and subscribed) capital of its 17 member states as per the capital key, those include the very states whose debt it is buying because market participants deem them insolvent, or at least illiquid.

Figure 1: Select Central Bank Balance Sheet Items (billions of local currency; Japan in trillions)

	Asset purchases/QE			Balance sheet			Capital & Reserves		Mon. Base
	Lcl currency	% of GDP	% of BS	Lcl currency	% of GDP	"Leverage"	Lcl currency	% of GDP	% of GDP
ECB	207	2%	9%	2420	26%	29.9	81	0.86%	16%
BoJ	41126	9%	29%	143206	30%	44.2	3,237	0.69%	25%
Fed	2644	17%	93%	2854	19%	52.9	54	0.36%	17%
BoE	275	19%	98%	282	19%	64.1	4.40	0.29%	4%
SNB	190	34%	53%	356	63%	7.5	47	8.40%	43%

Note: "Leverage" is calculated as balance sheet over capital and reserves
Source: National central banks, Haver, Author

The quandary of course is this: The more government bonds the ECB buys over time, the more likely it is to act as a hold-out investor should any future debt restructuring have to take place (unless there is a hard default, in which case it doesn't have a choice). In turn, the more debt is held by *de facto* senior official creditors, the bigger the haircut private sector holders will need to take. It also gives more power to bondholders to keep official financing flowing to allow them to run for the exit, as officials are trapped by their fear of a hard default. As a result, stepping in as a country is losing market confidence could generate increased selling pressure and see the ECB confronted not with a few hundred billion euros-worth of bonds but several trillion.

If instead the ECB does not hold out or there is a hard default (i.e. a debt service stop), its balance sheet could be seriously impaired. There are several options from there on: 1) the ECB is immediately and fully recapitalized by its creditworthy member states, although not the defaulting ones, which may lose influence, power , voting rights, etc. as a result; 2) recapitalization does not happen and private agents conclude that, like during the hyperinflations of the 1920s, the central bank will lose control and attempt to "print its way out" of the problem; 3) the central bank continues to operate as normal but with negative equity, akin to a company in receivership or Chapter 11, and slowly rebuilds its capital base via seignorage revenue over time.[2]

The risk that the ECB buys €1 trillion-2 trillion of Italian and Spanish debt, the sovereigns stop paying and there is zero recovery is an extreme and unlikely scenario, but one that lies within the range of possible outcomes and warrants analysis. For such a "corner solution," the likely escape route would be a

[2] See for example Thomas J. Jordan, Braucht die Schweizerische Nationalbank Eigenkapital?, Statistisch-Volkswirtschaftliche Gesellschaft Basel, September 28, 2011, on the SNB's recent experience with a sudden capital loss.

combination of the above three: The ECB would likely be recapitalized to some extent, but not the full amount of losses; it would operate with negative equity for a prolonged period while expectations of inflation steadily begin to rise. For this reason, ECB actions will likely stop short of such a step. A central bank cannot act as an LOLR to entities, be they banks or sovereigns, it deems insolvent. It can only provide bridge financing until a tenuous situation is worked out and in limited measure. The question thus becomes: *How far can the ECB go without either risking stoking inflation or requiring recapitalization, an effective fiscal transfer from Germany?*

What Then to Do?

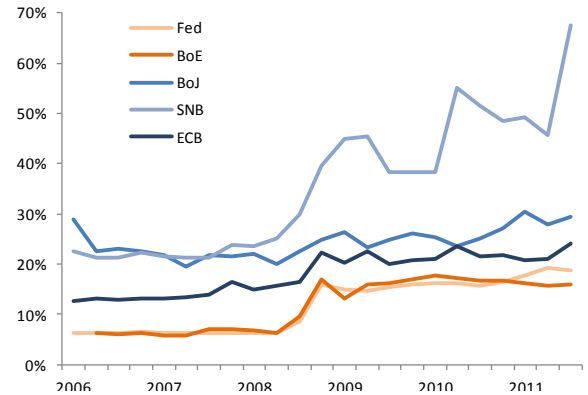
Since the start of the crisis, developed market central banks have engaged in a historically unprecedented degree of monetary accommodation for non-hyperinflationary periods. These periods were typically characterized by a sharp increase in currency issued, for example when the German Reichsbank allowed the currency in circulation to rise by five times between November 1913 and November 1918 and by 66 billion times between November 1913 and November 1923. Price increases accelerated when households found themselves with excess holdings of real money balances given their expectations of future money growth. In turn, these were driven by the Reichsbank's policy of unrestrained discounting of government and commercial debt.[3]

Given these experiences, it is worth determining the drivers that govern the amount of money in circulation. The reality is that the nominal amount of specie circulating is irrelevant. Indeed, differential amounts of currency in circulation are the reason why non-parity exchange rates exist in the first place. Varying choices of numeraire mean that the monetary base penetrating an economy can vary from as low as 4% of GDP to as high as 44% among the five economies reviewed here. Once the supply of money is established, the key determinants for the inflation and exchange rate are its growth rates relative to previous periods and relative to other countries.

a) Balance Sheet Expansions

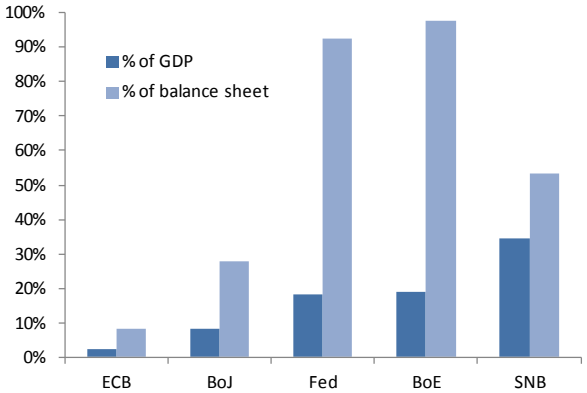
The balance sheets of central banks engaging in asset purchases increased by about 10% of GDP relative to pre-crisis levels, with the exception of the unique case of the SNB, which boosted its balance sheet by 43% points of GDP during that period. The amount of asset purchases among central banks varies widely, ranging from a high of 34% of GDP for the SNB to 17-19% for the Fed and the BoE and to 9% of GDP for the BoJ (Figure 2). The corresponding balance sheet sizes lie between 20% to 30% of GDP, with the notable exception of Switzerland and its 63% of GDP balance sheet. Three elements stand out about the ECB's position: 1) its €207 billion assets purchased on the market represent a minimal 2% of GDP, 2) the size of its balance sheet is in line with that of other central banks, at 26% of GDP, and 3) its balance sheet remains

Figure 2: Central Bank Balance Sheets, % of national GDP



Source: Haver, Author

Figure 3: Central Bank Asset Purchases/QE Operations



Source: Haver, Author

[3] See *Hyperinflation and Stabilization in Weimar Germany*, Steven B. Webb, Oxford University Press, 1989.

largely unencumbered, unlike those of the Fed and the BoE (Figure 3). Of course, these figures are not static. If the BoE expanded its QE operations by another £75 billion in Q1 2012 and the Fed were prompted into another US$300 billion of security purchases, their respective balance sheets would each expand to 21% of GDP (all else equal and assuming 2% nominal GDP growth). The ECB's situation is somewhat trickier: Tripling the size of its SMP program would lift its balance sheet to 31% of GDP and tie down no more than 21% of its assets. But the ECB also provides liquidity to the banking system via ever lengthening loans against government securities (LTROs). Yet, even that €600 billion together with a full €1 trillion of asset purchases would raise the balance to just over one-third of GDP, similar to that of the BoJ and just over half the size of the SNB's balance sheet.

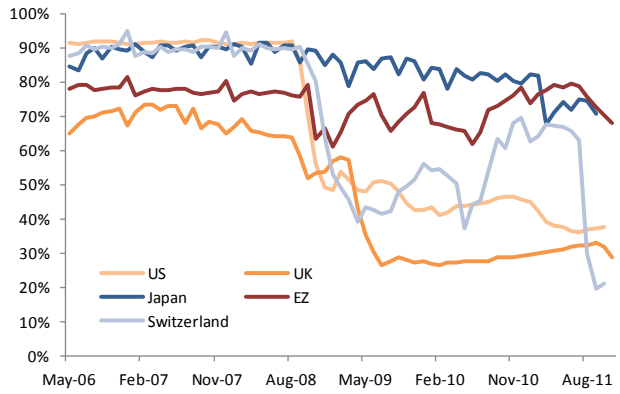
It is worth noting that, despite these operations, none of the central banks has caused an appreciable rise in inflation in its local economy. This reflects both the enduring presence of excess capacity in their respective economies and the composition and management of the liability side of their balance sheets. Unlike in earlier periods that led to hyper-inflation, central banks have refrained from ramping up the amount of currency in circulation so far. Instead, the counterpart of their asset purchases is a rise in bank reserves, the other main component of the monetary base. As a result, economies experiencing QE have seen the ratio of currency to the monetary base collapse rather than rise (Figure 4). This limits the risk of a descent into run-away inflation: Households are not faced with excessive money balances, while banks retain a high preference for liquidity, a tendency that would only intensify should the crisis escalate. But this is not feeding into an economy that is plagued by excess capacity and a dearth of demand. Instead, it is simply re-deposited at the ECB. This is not to say that these policies cannot eventually feed inflation expectations, but the more roundabout transmission channel via the banking system provides the ECB with a significant window of opportunity should a policy reversal be necessary.

b) The (Near) Irrelevance of Capital and Reserves

In a fiat currency system, the credibility of a central bank is built on the summation of its past policy actions and its inflation track record, unlike commercial banks whose solidity hinges on their equity capital. A central bank can become insolvent only if it has an unsustainably large stock of FX-denominated or index-linked liabilities (the ECB's such holdings represent only 0.5% of its balance sheet and it has easy access to swap arrangements). Alternatively, if a central bank had to pay a high interest rate on its own liabilities (e.g. bills, reverse repos) while operating in a global environment of low interest rates, in which its assets earn lower returns than its liabilities, or if it had enormous overhead costs, would a central bank have a *structurally* negative equity position. In this case, it would be obliged to successively increase the money supply to cover its costs, giving rise to accelerating inflation and ultimately losing control over monetary policy. Absent these special cases, the ability to issue base money guarantees that a central bank can stay both liquid and solvent even if its capital becomes temporarily negative.

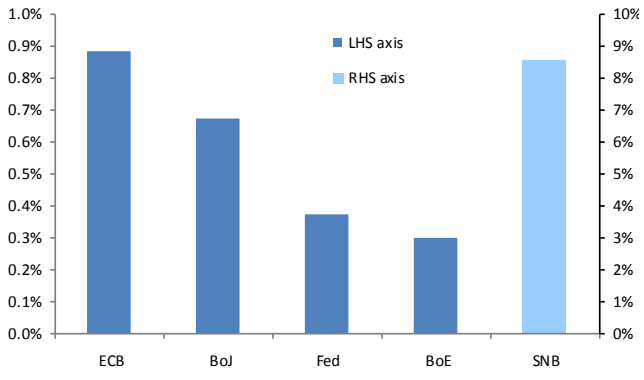
As a result, it is no surprise that central banks generally operate on thin ice: Paid-in capital for the five central banks typically amounts to a few billions, in no case represents more than 0.2% of GDP and in several cases

Figure 4: Currency Issued, % of Monetary Base



Source: Haver, Author

Figure 5: Central Bank Capital and Provisions, % of corresponding GDP



Source: Haver, Author

is effectively zero. This thin capital layer has not hampered central bank operations during the past decades, nor has the doubling of the balance sheets unhinged inflation expectations. To nevertheless safeguard against potential losses, central banks have built up significant provisions. But these too are *de minimus* both relative to the size of the economy and relative to central bank balance sheets: Combined capital and reserves average 0.6% of GDP, with the ECB the highest (bar Switzerland) at 0.9% of GDP (Figure 5). As a result, central banks are typically "leveraged" 30-60 times (Figure 1). The Swiss position is unique in that the SNB holds capital and provisions 10 times as high, at 9% of GDP. This reflects the SNB's experience of highly variable capital levels due to exchange rate fluctuations and the associated valuation changes of its large reserve holdings (Figure 6).

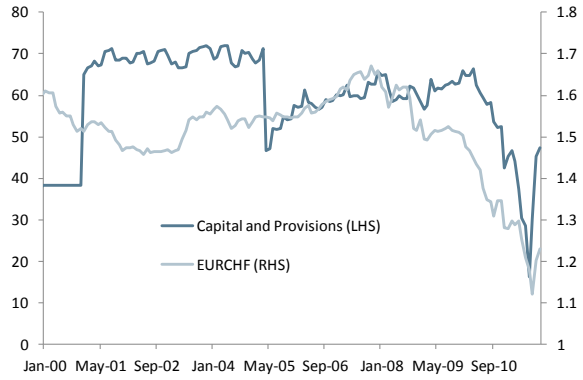
Its unencumbered balance sheet combined with a high degree of capitalization affords the ECB with significant leeway: It has set itself a "pain threshold" of maximum SMP purchases worth €20 billion per week, equivalent to an annual amount of roughly €1.0 trillion. Even raising its asset purchases to this level would leave the ECB with the lowest leverage ratio among its peers other than the SNB, bolstering its credibility in undertaking further large-scale purchases. However, a hard default even under limited purchases could wipe out the ECB's capital, all the more so as it is also taking on currency risk given the potential for euro exits (and the fact that most bonds are local law). Will this stop the ECB from even limited purchases or any action at all?

It is unlikely. Its behavior so far suggests not: Already, the €207 billion purchases undertaken so far would decimate the ECB's €10 billion paid-in capital under a mere 5% loss, and a 40% loss would eradicate its capital and provisions in their entirety. As the negligible amount of capital held by central banks shows, it is close to irrelevant in defining central bank credibility. What is more, the ECB would not be at a dead end: It could replenish its capital, drawing on its constituent member states according to the capital key and operate in negative equity until its profits from seigniorage have cured its balance sheet. Indeed, Willem Buiter estimated that the net present value of the ECB's seigniorage revenues amounts to €2.5 trillion assuming average growth and inflation of 2% each for the indefinite future.[4] While the ECB could not bring the entire future stream of revenues forward to the present with impunity, the calculations suggest its revenue base is large enough to allow it to shoulder significantly more risk.

Calibrating Monetary Policy

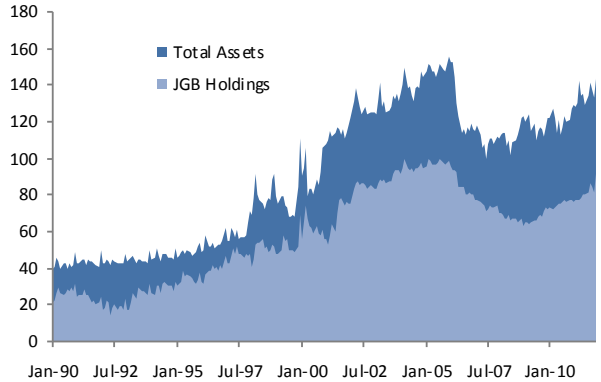
What if, despite the above and a persistently recessionary environment, inflationary expectations nevertheless ran amok? Consumers are in no state to accelerate their spending and currency issuance remains circumscribed. Meanwhile, the increase of the monetary base due to the boost in bank reserves is

Figure 6: EURCHF, SNB Capital & Provisions (CHF, bn)



Source: Haver, Author

Figure 7: BoJ Select Balance Sheet Items (JPY, trillions)



Source: Haver, Author

[4] Willem Buiter, *Games of 'Chicken' Between Monetary and Fiscal Authority: Who Will Control the Deep Pockets of the Central Bank?* Citigroup, July 21, 2010.

re-deposited at the ECB itself. Should the liquidity injected by the ECB ignite a renewed lending boom, it would be the first to notice. Were it to fear adverse consequences from this, it could raise the deposit rate as a first defense. More importantly, it could begin to contract its balance sheet again. Having been an early adopter of QE policies, Japan has also shown the world how to retreat from it: Between the peak of its holdings in 2005 and 2007, the BoJ sold some JPY35 trillion back to the public, shrinking its assets by a full JPY55 trillion or one-third of the total (Figure 7).

Should it for some reason not be possible to resell sovereign security holdings in three-to-five years' time, the ECB could manage other parts of its balance sheet down. As mentioned previously, government holdings represent only a small share of the ECB's balance sheet. Unlike the Federal Reserve which owns 30% of USTs outstanding, which in turn account for 60% of its assets (total securities represent 90%), the ECB holds 27% of its assets in bank loans (Figure 8). It is thus a system set up in the banks' favor, which in turn buy European government securities. It also explains why the ECB is so steadfastly opposed to sovereign debt restructurings and unlimited government security purchases. Ultimately, the ECB will have to choose which "business model" best supports its monetary policy objectives.

Short of the extreme outcome (hyperinflation), the ECB has room to maneuver, though. Interventions to limit a further rise in sovereign yields could salvage merely illiquid sovereigns while leaving the incentive to undertake fiscal adjustment intact. Indeed, the ECB need not even stray from its mandate in order to proceed: The sharp rise in long EZ-wide yields justifies steps to flatten the yield curve given the current recessionary outlook. In addition, it would behoove the ECB to align all of its policy tools, so that they point in the same direction—specifically, abandoning the current sterilization practice. These operations make little sense as banks willingly deposit funds at the ECB's other deposit facilities and only add an administrative layer that sends mixed signals to the market. Interest rates ought to be lowered faster and the ECB ought to adopt a more negligent role toward the value of the euro. If inflation were allowed to accelerate moderately, this could even help narrow differences in competiveness: Containing real wage increases in debtor countries through inflation is politically much easier than cutting nominal wages.

However, it is clear is that a single monetary policy cannot work for a heterogeneous group of member countries. The theory that the optimality of a currency union can be endogenous has failed. One size indeed fits none as balance of payments problems persist. Not even a fiscal union, let alone a monetary union, can paper over that. But a monetary policy that discriminates among member states by offering varying degrees of reserve requirements and varying collateral rules would at least not exacerbate incipient credit booms. In the meantime, we have shown that there is significant room for larger, riskier and more decisive ECB asset purchases that could help stabilize markets, if they are taken in conjunction with other measures supporting sovereign solvency.

Figure 8: Select Items of Fed and ECB Balance Sheets (local currency billions and % of total)

ECB Assets

	EUR	%
Securities for monetary purposes	268	11%
Other securities	338	14%
General gov't debt	34	1%
Lending to banks (incl OMOs)	732	27%
IMF	81	3%
Foreign Reserves	153	6%
Gold	420	17%
Other	434	20%
Total	2460	100%

Fed Assets

	USD	%
UST	1671	58%
Agency	106	4%
MBS	827	29%
Repo/loans	10	0%
Maiden Lane I-III	38	1%
Gold	11	0%
Other	196	7%
Total	2858	100%

Source: Fed, ECB