Discussion note

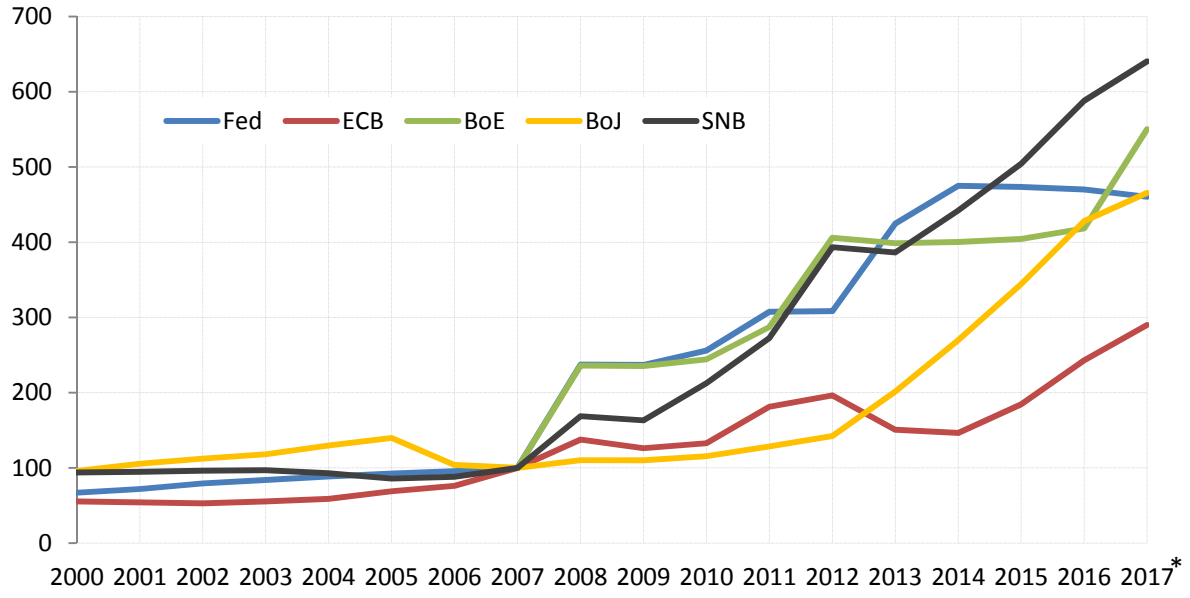
Central bank balance sheets in the new normal

The central banks' balance sheets increased considerably in size in the aftermath of the crisis to previously unprecedented levels. This poses a dilemma for policymakers whether, to what extent, and how quickly to downsize the balance sheets or whether to keep balance sheets at current elevated levels. This note discusses pros and cons of elevated balance sheet, potential costs of winding down, and additionally elaborates on whether different mandates of central banks and/or different monetary policy setups provide different incentives to respond to this issue.

Due to low long-run real interest rate that prevailed in the global economy in recent years, many central banks across the world have applied various unconventional monetary policies including negative deposit rates, or quantitative and qualitative easing policies. Consequently, the central banks' balance sheets increased in size (figure) to previously unprecedented levels.

The central question of this note is whether an exit from extraordinary loose policies should be followed by downsizing the balance sheets or whether an elevated level of central bank balance sheets should be considered a new normal.

Chart 1 Central Bank Balance Sheet, 2007=100



Note: *2017 (the end of October)
Source: Own calculations

In general, two types of policies have been behind the fast swells of central bank balance sheets in different countries. The first type is an unconditional purchase of securities and the other one is forex interventions. Although both types of policies lead to large increases on the asset side, our focus is primarily on the first type of policies, which directly relate to the Eurosystem stance.

1. Historical evidence

Among all QE programs implemented so far (see table for the list of QE across history), only the first two, both having occurred before the Great Financial Crisis, have been successfully wound down so far, and relatively fast.

Security purchases	**Year(s)**	**Volume** (€ billions)	**Balance sheet**
Fed	Spring 1932		2% of GDP
Bank of Japan	2001-2006	516	1,5% of GDP
Fed QE1 – QE2	2008-2011	2 490	14% of GDP
Fed QE3	2012-2014	731	6% of GDP
Bank of England	2009-2010	236	13% of GDP
ECB (SMP and CBPP)	2009-2012	285	3% of GDP
ECB (EAPP)	2015-2017	2 100	20% of GDP
Sveriges Riksbank	2015-2017	20	6% of GDP
Bank of Japan	2008-2017	3 400	90% of GDP

The most notable currency intervention policies			
Swiss peg	2011-2016	279	60% of GDP
Czech peg	2013-2017	92	66% of GDP

The BoJ implemented its QE program via the purchase of three-month bills issued by commercial banks between 2001 and 2006. The total injected liquidity amounted to six times the original 2001 statutory reserves. When signs of a recovery in the economy and private demand for loans appeared, the BoJ drained the excess liquidity from the banking system within three months simply by choosing not to reinvest the proceeds of maturing bills. As the QE was limited to the short end of the curve, there was little if any impact on the long term bond market.

2. Pros and cons of maintaining high level of balance sheet

The Swiss central bank has imposed negative nominal interest rates in order to re-establish a material interest rate differential vis-à-vis the major economies, the Eurozone in particular. The negative rate thus contributes to restoring the relative attractiveness of foreign currency investments for Swiss investors and corporates. At the same time, it aimed to reduce the incentive for foreign investors to invest in Swiss franc-denominated assets.

Negative interest rate policy, however, does not come without adverse side effects, notably for financial stability and the efficient use of capital, to name just two areas of concern.

The central bank also implemented monetary policy focused on enforcing a minimum exchange rate of CHF 1.20 per euro. This policy resulted in a dramatic increase of the SNB's foreign exchange holdings from about CHF 220 billion in August 2011 to CHF 680 billion by the end of 2016, when the policy was abandoned. At the end of the program, the balance sheet corresponded to approximately 100% of Swiss GDP. Very large balance sheets are considered risky for at least two reasons.

The first reason is that an uncontrollable expansion of the balance sheet (large excess reserves) would have severely impaired the SNB's ability to effectively conduct monetary policy and to fulfil its price stability mandate in the long run. Namely, if the SNB wished to lift their policy rate, commercial banks would have excessive funds to tap for liquidity given immense reserves held with the central bank. That is why a new higher policy rate may not materialize in financial markets and monetary policy would therefore be less efficient.

The second reason is that the larger the balance sheet, the larger the corresponding *accounting risks* for the SNB. Potential losses invoked notably by the exchange rate risk but also by interest rate and credit risks might exceed the SNB's capital.

The Swiss attitude is that the SNB is ready to use instruments of unconventional monetary policy, should they prove necessary, but when the economic and financial situation is deemed to have stabilized, it wants to reverse gears and return to the pre-crisis status quo.

The Fed's balance sheet has recorded a roughly fivefold increase since the financial crisis, from about $900 billion in 2007 to about $4.5 trillion today. The increase mostly reflects the Fed's large-scale asset purchases (quantitative easing), which the FOMC employed in three rounds between 2008 and 2014 to reduce longer-term interest rates to help the economy recover. Although the Fed stopped adding to its stock of financial assets in October 2014, it still holds about $2.5 trillion of U.S. Treasury securities and $1.7 trillion of government-guaranteed mortgage-backed securities. On the liability side, the largest category is reserves, which totals to about $2.4 trillion, i.e. 20 times statutory reserves.

Prior to 2008, the Fed managed the Fed funds rate by changing the quantity of reserves in the system (conventional MP). Today, with the enormous amount of excess reserves, the Fed influences its fund rate and other short-term rates primarily by varying the interest rate it pays banks on their reserves (known as IOER, or interest on excess reserves). To further improve its control of interest rates, the Fed now also allows other private-sector institutional lenders, such as money market funds, to earn a fixed rate of interest on cash held for short periods with the Fed, through a program known as the overnight reverse repurchase (RRP) program. This unconventional MP allows the size of the balance sheet to be disentangled from the setting of interest rate.

There are potential upsides as well as downsides associated with a large Fed's balance sheet. Former chairman Bernanke has offered three **arguments for keeping the balance sheet** close to its current size:

- First, a large Fed balance sheet could be a tool for enhancing financial stability. Many studies suggest[1] that there is a strong demand from the private sector for safe, liquid, short-term securities and these could be provided in the form of bank reserves that would crowd out at least some risky private behavior.
- Second, a larger balance sheet that incorporates a robust RRP program could improve the transmission of monetary policy. With the RRP program providing a direct link between the short-term policy rate and the securities markets, the Fed could rely less on the indirect transmission of monetary policy through the banking system.
- Third, during a panic, Fed's role as a lender of last resort is partly impaired by commercial banks' unwillingness to borrow because of their fear to be identified as financially weak (stigmatized). In the new environment, where not only banks but also other financial institutions deal directly with the Fed, the stigma is mitigated.

There are, however, **risks** associated with a large Fed balance sheet:

- First, the acquisition of non-Treasury assets by the Fed means that the Fed interposes itself between private borrowers and lenders and exploits its creditworthiness to lower private borrowing costs and facilitate credit flows. In doing so, however, the Fed essentially makes a fiscal policy decision to put taxpayer funds at risk. Even Fed lending that is fully collateralized and subject to a negligible risk of loss *exposes taxpayers to losses* if the borrower fails subsequently. For instance, Fed emergency lending that finances the withdrawal of uninsured claimants of a financial institution that fails subsequently strips that institution of collateral that would otherwise be available to cover the cost of insured deposits or other government guarantees.[2]
- Second, when central banks become dominant buyers of 'safe' assets then financial markets are becoming no longer able to price risk effectively.

[1] e.g. Greenwood R., Hanson S.G., Stein J. C. : The Federal Reserve's Balance Sheet as a Financial-Stability Tool, Prepared for the Federal Reserve Bank of Kansas City's 2016 Economic Policy Symposium in Jackson Hole
[2] Goodfriend, (2011)

Nearly a decade after starting a stimulus program, in October 2017, the FOMC has announced the process of unwinding quantitative easing, in a signal of its confidence in the recovery. It will start to shrink its balance sheet by allowing a small initial amount of bonds — $4 billion of mortgages and $6 billion in Treasuries per month — to run off the portfolio without reinvestment. Every quarter, it will increase the amount to a maximum of $20 billion in mortgages and $30 billion in Treasuries per month to be reached in about a year's time.

One question the central bank hasn't yet decided is how large should its balance sheet be at the end of the process. The Fed will likely end up with more assets than it had before the crisis because its liabilities have grown — there is more currency in circulation. As New York Fed President William Dudley said in a speech in September, the balance sheet size could settle out at between $2.4 trillion and $3.5 trillion sometime early next decade.

The intended process of reducing balance sheet is a combination of the following strategies:

- hiking interest rate before completing balance sheet reduction,
- reducing balance sheet by halting reinvestment flows or,
- actively selling bonds in the market.

Each strategy, however, bears a significant cost when implemented.

The policy of raising interest rates at appropriate time, even if the balance sheet remains large for an extended period (FOMC, 2013, Bernanke) may be prohibitive due to potential cost for the Fed. If the Fed Funds rate eventually returns to the FOMC's desired level of around 4 %, while excess reserves amounted to $2.4 trillion, the Fed would have to pay around $100 billion each year to commercial banks for not lending money to private sector.[3]
A reduction of the Fed's balance sheet by an outright sale of government bonds before maturity will cause the realization of massive capital losses to the Fed (about 3 % of GDP according to the IMF) and could exercise a strong upward pressure on interest rates.

If the Fed holds the bonds to maturity, it will receive full principal payments, so this massive loss may not materialize. However, keeping long term bonds to maturity creates additional problem. Because the bonds were issued by governments, their redemption will only reduce the government's balances at the central bank and not the excess reserves in commercial banks' accounts at the central bank. Because the Treasury's account at the Fed is not large, the government will have to issue new refunding bonds to the private sector. This will happen in a time when the balance sheet recession is over and private borrowers start to emerge and will compete with government for private funds. This could therefore exert an upward pressure on interest rates over next several years.

In January 2015, the Governing Council of the **European Central Bank (ECB)** announced an expanded asset purchase program (APP) aimed at fulfilling the ECB's price stability mandate. This program has authorized the ECB to add the purchase of sovereign bonds to its existing private sector asset purchases in order to address the risks of a too prolonged period of low inflation. APP has consisted of several packages (from QE1 to QE4) with a total amount equal to 2 100 bn €, corresponding roughly to 20 % of GDP.

In September 2017 the ECB announced that it would extend its asset purchase program (APP) beyond the end of 2017 for an additional nine months until September 2018, with the pace of purchases to be reduced from the current €60bn to €30bn from January 2018. The Governing Council stated that the asset purchase program was left open-ended, pending on inflation developments. The ECB also reiterated that interest rates would be kept at current low levels "well past" the period of net asset purchases.

[3] Before 2008 Fed remittances to the US Treasury were fairly steady, in the neighborhood of $20 billion a year.

This means that the Eurosystem will still remain adding to the stock of its balance sheet in the forthcoming months. Being still in the stage of net positive flows, there has not yet been an extensive discussion or communication on the future envisaged levels of balance sheets. However, some signals that new normal should include an artillery of balance sheet measures to support the transmission mechanism has been lately voiced by several policymakers.[4] This implicitly rationalises somewhat higher stock of assets for future policy needs.

3. Central bank mandate and the choice of approach

The Financial Services Regulatory Relief Act of 2006 gave the Fed an authority to pay interest on reserves. Fed announced on October 6, 2017 that it would begin paying interest on required and excess reserve balances. Several other central banks, such as the European Central Bank and the central banks of Canada, England, and Australia, have somewhat similar deposit facilities allowing banks to earn overnight rates on their balances. The ECB currently pays negative rate on reserves. As in the case of Fed, deposit rate is connected to the MRO, so any excess liquidity held with the ECB, when rates increase, would have to be remunerated. Any perspective of incurring larger losses from such payments could enter into discussion when exit from low interest rate environment is on the table.

While BoJ balance sheet reversal in 2006 had been rather swift, because of the program focusing on purchases of short term private securities, absorbing excess liquidity produced by purchases of long term securities can be potentially very lengthy, costly and distorting.

Still, there might be additional complication for the Eurosystem purchases compared to those of the Fed. Unlike Fed, which has a long history of conducting monetary policy also via open market operation, this has not been enshrined into the ECB framework.

In addition, decentralised framework of the Eurosystem makes smaller NCBs more exposed to the potential losses, which might exceed the amount of their capital. For instance, the National Bank of Slovakia currently (end 2016 figure) holds purchased securities in the amount of 60% of its total assets, while already operating with negative capital.

The Fed is partially insulated from this constraint as it is an issuer of the world reserve currency. In practice, this means that a much larger portion of central bank liabilities is represented by cash in circulation, and therefore a large part of the costs of assets can be financed by seigniorage.

Some academics argue that central bank losses or even negative capital are meaningless and can be ignored.[5] But there is no historical precedent to suggest how the currency or the bond market might respond, if massive losses leave a central bank facing accounting insolvency. In particular, we are missing the evidence, what would be the response of large foreign investors.

4. Conclusion

All in all, there is no clear cut answer to the question, what is the proper central bank balance sheet size in the new normal, i.e. post exit from the zero lower bound. It is, however, obvious that the Eurosystem framework does not yet provide as much liberty to downsize the balance sheets to pre purchases level as in the case of the Fed. It will certainly be a substantial challenge for all large central banks.

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[4] For instance, in the speech by the ECB executive board member B. Coeure in September 2017 (https://www.frbatlanta.org/-/media/documents/news/conferences/2010/fiscal-policy/goodfriend.pdf)
[5] e.g. Bunea et al. (2016)

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