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Excess liquidity and bank lending risks in the euro area

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Executive summary

EXCESS LIQUIDITY (defined as all kinds of commercial bank deposits held by the Eurosystem minus the minimum reserve requirements) in the euro area exceeded €1,900 billion, or 17 percent of euro-area GDP, in September 2018. Holding such excess liquidity is costly for commercial banks, given that the currently negative (-0.4 percent) deposit facility interest rate applies on excess liquidity holdings. The current stock of excess liquidity implies an annual €7.6 billion cost in total for those banks that hold this liquidity. More generally, the European Central Bank's negative deposit interest rate and asset purchases further reduced market interest rates, with a negative impact on banks' net interest income and thus profitability. This could incentivise a reach-for-yield race among banks. Additionally, the access to liquidity eased significantly and removed the liquidity constraint for most banks' lending activities. These factors might incentivise banks to engage in risky lending in order to improve their profits. This in turn might create financial stability risks.

WE CLARIFY THE definition of excess liquidity, to highlight the reasons why such a large amount of it is being held, and to assess its financial stability implications.

Key findings

- Excess liquidity was practically zero before September 2008, and has fluctuated since then, with a peak of close to €1,000 billion in 2012 followed by a major reduction, and an even more significant increase starting in March 2015. The reason behind the 2008-2012 increase was banks' demand for liquidity because of the break-down of normal interbank market operations and heightened risks. This demand was satisfied by the ECB and even incentivised by the ECB's generous lending facilities. Since March 2015 the ECB's expanded asset market programme (APP) automatically creates excess liquidity, unless it is converted to cash or compulsory reserves because of an increase in banking activities;
- We do not find increased conversion of excess liquidity to cash, probably because the cost of holding cash is higher than the negative interest rate to be paid after excess liquidity;
- Excess liquidity is highly concentrated in a few countries, and in a few banks within countries, highlighting that it is not a widespread issue throughout the euro area;
- Excess liquidity in the euro area is in fact much lower than related indicators in Japan, Switzerland and the United States, and also somewhat lower than in the United Kingdom;
- While the direct marginal impact on bank profits of the ECB's negative deposit rate levied on excess liquidity is negative, the overall impact of the negative rate and other monetary policy measures, such as asset purchases, could be positive. Monetary policy measures can increase asset prices and improve the economic situation, which enhances the credit quality of bank assets, thereby improving bank profitability. Empirical research has found that the overall impact of monetary policy on bank profitability has been positive;
- Most euro-area banks are still in the deleveraging phase of the financial cycle, implying that their risk appetites might be limited;
- Risk-weighted assets relative to total assets are declining (implying lower riskiness) or remain broadly stable in most euro-area countries, suggesting that bank balance sheets have not become risker. Compositional changes, upgrades to bank client credit ratings, fewer non-performing loans (NPLs), the deleveraging process, cautious internal risk limitation measures and stricter financial regulation might contribute to the decline in risk-weighted assets;
- Home bias in loans granted and securities purchased by banks has increased in most countries, highlighting that banks have become more exposed to developments in their home countries, which is a risk factor;
- Bank lending growth remains subdued with the exceptions of Belgium and Slovakia, suggesting that in the majority of euro-area countries, the expansion of housing loans remains well below values observed during earlier housing booms;
- House prices have started to pick up in a number of euro-area countries, but to a lesser extent than house price increases during earlier housing booms, with the exception of Ireland. However, the acceleration in house prices requires attention from macroprudential authorities;
- Bank credit standards for household loans have been tightened in most countries that experience rapid house prices increases, suggesting that banks aim at containing their risks;
- Our overview of macroprudential reports issued by relevant authorities suggests that the overall risk to financial stability remains low, but in certain countries the accelerated increase in house prices is already in the spotlight;
- We argue that monetary policy tools are ill-suited to fostering financial stability;
- Finally, we note that while the winding down of excess liquidity is a remote prospect at the moment, when this happens, banks that rely heavily on excess liquidity to meet the Liquidity Coverage Ratio (LCR) requirement might face problems, which could have financial stability implications.

1 Introduction

The European Central Bank's various non-standard monetary policy tools, such as large-scale liquidity provision through various long-term refinancing instruments, asset purchases and the adoption of a negative deposit rate on the ECB's deposit facility for commercial banks, likely had a positive impact on economic developments in the euro area. Such ECB measures also supported the banking system both directly (via, for example, cheap financing) and indirectly through the better economic outlook, which impacts banks through various channels. Partly because of ECB measures, lending by euro-area banks also started to pick up from zero percent loan growth in early 2014 to 3 percent in the first half of 2018 – a rate that is still well below pre-crisis credit growth rates.

At the same time, banks' various deposits and reserves held at ECB have increased to unforeseen levels, which is actually costly for banks: excess reserves and deposits are subject to the ECB's deposit facility interest rate, which, at the time of writing, is negative at -0.4 percent. A direct impact of this negative interest rate is a deterioration of bank profits. Yet this direct cost is not the only factor influencing bank profitability – and in fact it is not the most important factor. Low interest rates and asset purchases tend to reduce the loan/deposit interest rate differential and the spread between long-term and short-term interest rates, and thereby squeeze bank profits. More generally, low nominal interest rates might incentivise agents, including banks, to take more risks. These direct and indirect effects and the abundant liquidity might trigger riskier lending behaviour from banks[1].

However, the right question, in our view, is not whether banks lend to riskier borrowers, but the degree of risk. If banks only lend to super-safe borrowers, they are unlikely to face defaults, but at the same time economic growth might be too slow. Banks should also deal with, for example, start-ups and innovators, which might be riskier, but also offer the potential of fast growth. Therefore, the right question, in our view, is whether banks take undue risks that might endanger financial stability.

In this Policy Contribution, we clarify what excess liquidity is and argue that it is not a good indicator of whether banks' have more incentives in risk taking. We then look at indicators that might signal that bank lending in the euro area creates undue risks. We conclude that this is unlikely to be the case.

2 Excess liquidity

While excess liquidity in the euro area was close to zero before 2008, it grew to exceed €1,900 billion by September 2018 and is still on an upward moving trend. The current value of excess liquidity is very large as it amounts to about 17 percent of euro-area annual GDP. Before assessing the potential impacts of excess liquidity, we clarify its notion, put euro-area values into perspective in relation to Japan, Switzerland, the United Kingdom and United States, and analyse the reasons for hoarding so much excess liquidity and its distribution across countries and banks.

2.1 Liquidity and excess reserves

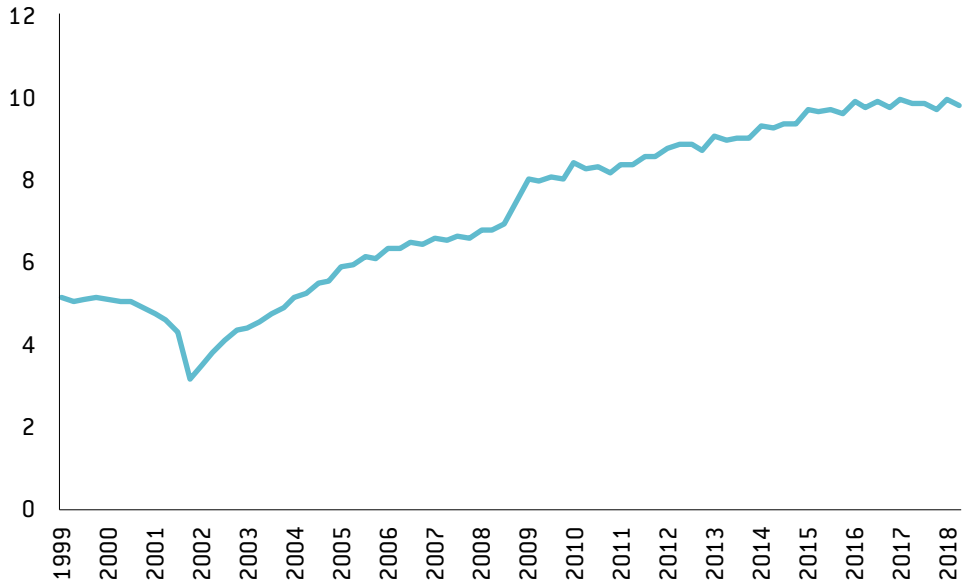
An asset is regarded as 'liquid' if it can be used quickly for payments. For example, a natural person can withdraw cash from her/his current account (sight deposit) held at a retail bank without any notice or penalty, so a current account is liquid. However, a house is not really liquid because selling a house and converting it to cash takes time.

1 The econometric analysis in Demiralp *et al* (2017) concluded that the negative ECB deposit interest rate led to more lending by banks.

Commercial banks also hold various liquid assets. For example, a government bond is rather liquid because (in most cases) it can be sold and converted to money quickly. But loans granted by a bank are not liquid because they are difficult to sell. The most liquid assets that commercial banks can hold is reserves held at the central bank. These can be used to satisfy minimum reserve requirements (where such requirements exists), converted to cash if customers wish to take out their bank deposits, and transferred to other banks to settle payments.

Central bank money consists of cash or 'currency in circulation' (banknotes and coins) and commercial banks' reserves (ie deposits) held at the central bank (see eg Box 1 in Baldo *et al*, 2017). These are liabilities of the central bank and assets of their owners, ie commercial banks, other entities and natural persons holding cash, while banks' reserves are obviously the assets of commercial banks[2]. The central bank is in full control of central bank money, ie the sum of these two items. But the central bank does not control the distribution of the two components, since banks can change their deposits at the central bank to cash. The central bank also does not control which banks hold central bank money. An individual bank can reduce its central bank money holdings, for example by lending to other banks, purchasing assets or transferring funds on behalf of its clients, but the banking system as a whole cannot: the central bank money always ends up with another bank and thus in an account at the central bank.

Figure 1: Currency in circulation in the euro area (%GDP), 1999Q1-2018Q2



Source: Bruegel based on the ECB's Statistical Data Warehouse, BSI.M.U2.N.V.L10.X.1.U2.2300.Z01.E (Currency in circulation) and MNA.Q.N.U2.W2.S1.S1.B.B1GQ._Z._Z._Z.EUR.V.N (quarterly GDP). Note: data refers to the euro area (changing composition), at current prices, non-adjusted. In order to show the share of cash in annual GDP, we multiply quarterly GDP by 4.

In terms of converting banks' reserves to cash, one might expect that as a result of low and even negative deposit rates, cash holdings go up. This is because banks might not wish to pay the penalty of the negative deposit rate, while commercial bank customers might decide to hold more cash when they face very low deposit rates[3]. When interest rates are low globally, people and companies outside the euro area might also hold more euro cash. But

2 In addition to cash and bank reserves, central bank liabilities also include an item designated by the ECB as "*autonomous factors*", such as deposits by governments and other account holders with the central bank. Autonomous factors also influence central bank liquidity.

3 Overall, retail banks did not impose negative interest rates on their customers, though many banks cut the interest rate on current accounts to zero and increased other fees.

the data does not suggest any unusual increase in euro cash holdings recently. Figure 1 shows that the currency in circulation as a share of euro-area GDP has been on an upward trend since 2002 – for which there must be structural reasons. It is interesting to observe that there was a distinct increase in the cash/GDP ratio at the beginning of the financial crisis (from 2008Q3 to 2009Q2), which is probably explained by agents turning to cash for safety reasons. After 2009Q2, the steady increase in the cash/GDP ratio resumed. This trend has continued since the negative deposit rate was introduced in 2014, yet the growth rate has slowed and in 2016-18 the ratio of cash to GDP has remained broadly stable, even though ECB deposit rates became more negative. This suggests that there is no increased substitution by cash of negative interest-bearing bank deposits at the ECB. It is likely that the cost of storing cash is higher than the negative interest rates banks have to pay on their ECB deposits.

In the euro area and in many (but not all) countries outside the euro area, banks must hold a certain share (currently 1 percent) of certain liabilities, mainly customers' deposits, as reserves at the central bank. Traditionally, such reserves serve as a guarantee that banks will be able to obtain cash from the central bank in case depositors wish to withdraw their deposits. The amount of reserves held at the central bank in excess of the minimum reserve requirement is considered as 'excess liquidity' (see, for example, ECB, 2017).

In many countries, banks have a single account at the central bank, but in the euro area, banks' excess liquidity can be held in three accounts:

- Current account[4]: banks must deposit sufficient funds in their current account at the ECB to meet the minimum reserve requirements (MRR); the MRR should not be met each day, but on average over six weeks during the so-called maintenance period (MP);
- The ECB has a deposit facility for banks; and
- The ECB has a fixed-term deposit instrument for certain monetary policy purposes, such as sterilising the assets purchased under the Securities Markets Programme[5].

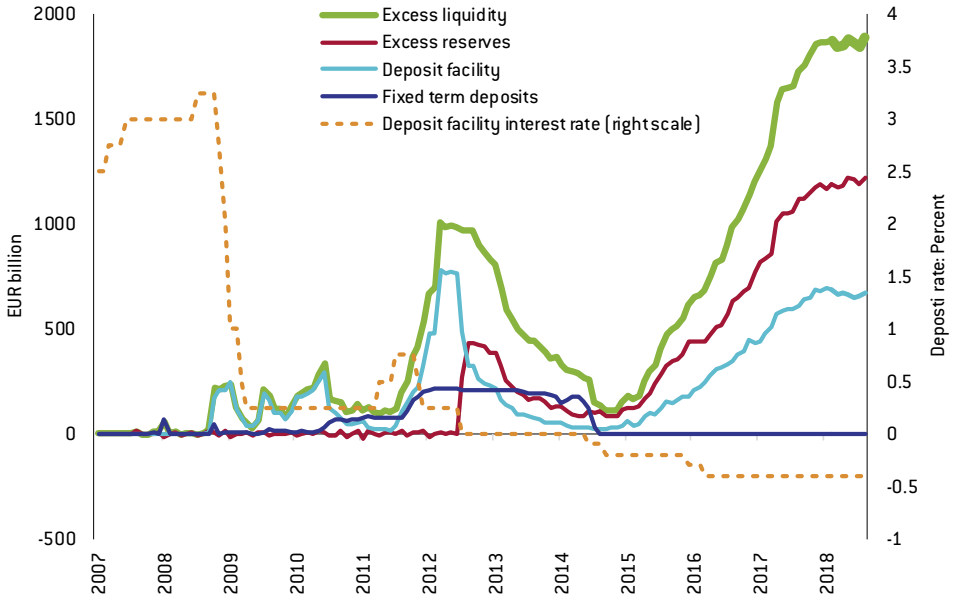
Excess liquidity was practically zero before summer 2008, after which there were a number of ups and downs, with a major peak close to €1,000 billion in 2012, which fell to below €100 billion by mid-2014 (Figure 2). There has been a steady increase since early 2015 and the September 2018 value of excess liquidity surpassed €1,900 billion.

Figure 2 allows us to study the components of excess liquidity. In the past, excess reserves did not earn interest but banks received interest for the money they placed in the deposit facility. Therefore, before the deposit rate was cut to zero in 2012, banks hoarded all their excess liquidity in the deposit facility and tried to keep excess reserves to zero. But when the deposit facility interest rate was reduced to zero in 2012, banks switched slightly more than half of their deposits to the current account and therefore increased their excess reserves. Consequently, banks do not have to worry about keeping exactly the minimum amount in their current account with the ECB. Since the ECB decided to introduce a negative rate on the deposit facility in 2014, it treats the current account balances (in excess of the minimum reserve requirement) and the deposit facility in the same way, and consequently banks have remained indifferent on whether to hold their excess liquidity in their current account or in the deposit facility. Since the sterilisation of SMP holdings was suspended in 2014 and as no similar measures have been introduced, banks' deposits in the fixed-term deposit fell to zero.

4 Banks' current accounts at the ECB should not be confused with the current account of the balance of payments.

5 In May 2010, the ECB launched the Securities Markets Programme (SMP) to improve the transmission of monetary policy. Under this programme, it purchased the government bonds of Greece, Italy, Ireland, Portugal and Spain. Since the goal was to support monetary transmission and not to implement a monetary stimulus, the bonds purchases were sterilised, ie the Eurosystem re-absorbed the liquidity provided through the SMP by means of weekly liquidity-absorbing operations until June 2014, when the ECB suspended this sterilisation (see the 'Terminated programmes' section at https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html). The banks' deposits in this weekly deposit account would otherwise have been excess reserves or deposits held on the deposit facility; see footnote 3 of Baldo *et al* (2017).

Figure 2: Banks' excess liquidity and its three components, along with the ECB's deposit facility interest rate, January 2007 – August 2018



Source: Bruegel based on ECB's Statistical Data Warehouse (deposit facility: ILM.M.U2.C.L020200.U2.EUR, fixed term deposits: ILM.M.U2.C.L020300.U2.EUR, current account: ILM.M.U2.C.L020100.U2.EUR, reserve base: BSI.M.U2.N.R.LR0.A.1.A1.0000.Z01.E, deposit rate: FM.B.U2.EUR.4F.KR.DFR.LEV). Note: Banks' excess reserves are the reserves banks hold in their current accounts with the ECB minus the minimum reserve requirement. Because of the huge volatility of daily data, we use a 30-day moving average. Excess liquidity is the sum of excess reserves and the amounts help at the deposit facility and fixed term deposits.

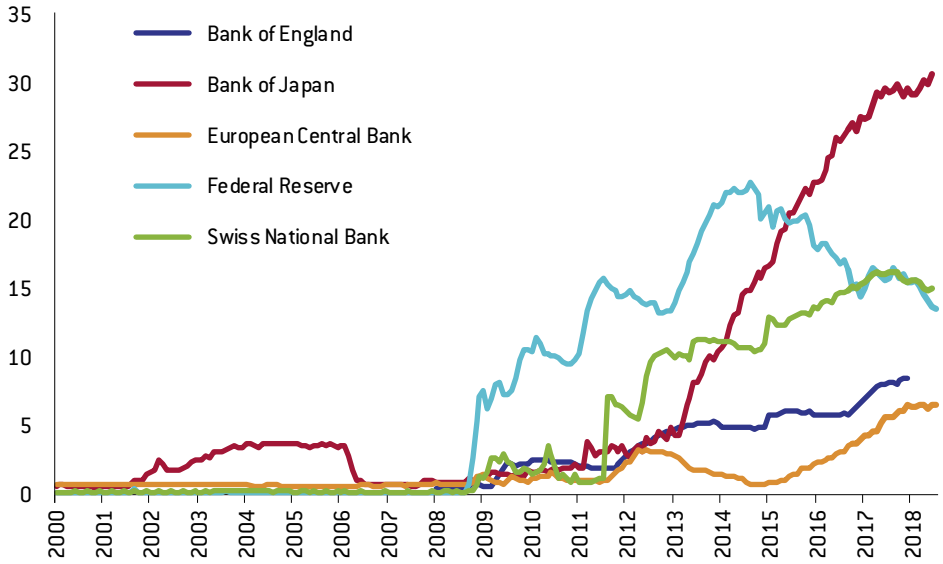
2.2 Banks' reserves at the central bank: a global comparison

The €1,900 billion euro-area excess liquidity amount sounds like a huge number. It is therefore useful to view euro-area excess liquidity from a global perspective. There is no reserve requirement in some countries (eg the United Kingdom) and therefore excess reserves and excess liquidity cannot be calculated for these countries. We therefore show ratios of total reserves to total banking system assets (Figure 3). For the ECB, we consider all three relevant accounts banks hold at the ECB, as discussed in the previous section.

Before the crisis, total bank reserves were below 1 percent of total banking assets in the euro area, Switzerland, the United Kingdom and the United States, and also in Japan before 2002 and in 2006-2008. From 2002-06, a period when the Bank of Japan had already adopted non-standard monetary policy by purchasing assets, reserves of Japanese banks increased to about 2-4 percent.

Since mid-2008, however, there has been a substantial increase in banks' reserves/asset ratios in all five jurisdictions. In fact, the smallest increase has been observed in the euro area (to 6.5 percent), suggesting that the level of excess liquidity in the euro area is not exceptional and in fact is much lower than in Japan (30 percent) or the peak in the United States (23 percent) or the latest value in Switzerland (15 percent).

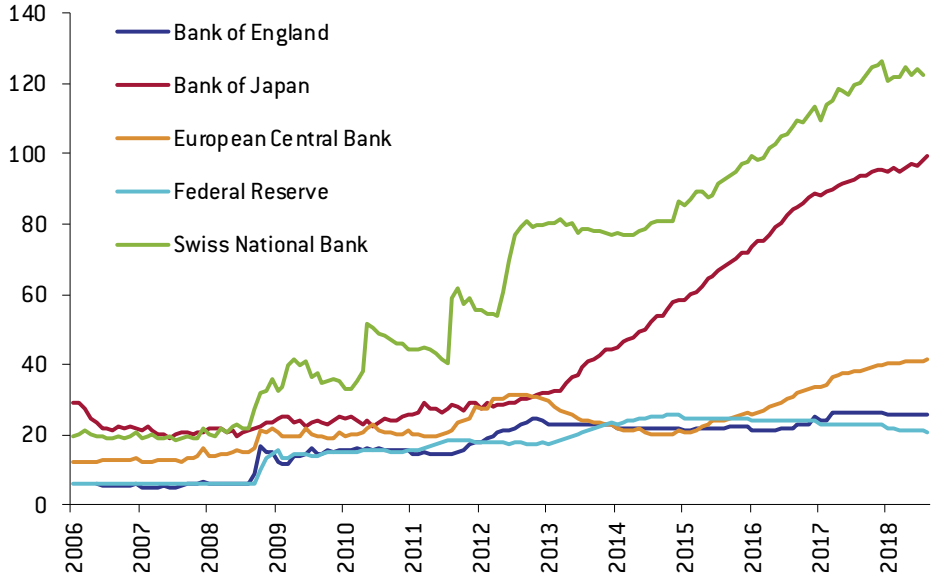
Figure 3: Banks' total reserves held at the respective central bank, as a share of total banking system assets, January 2000 – July 2018



Source: Bruegel based on ECB's Statistical Data Warehouse (deposit facility: ILM.M.U2.C.L020200.U2.EUR, current account: ILM.M.U2.C.L020100.U2.EUR, Fixed-term deposits: ILM.M.U2.C.L020300.U2.EUR, total assets: BSI.M.U2.N.A.T00.A.1.Z5.0000.Z01.E); Federal Reserve Bank of St. Louis (total reserves: RESBALNS, total assets: B1151NDMDM); Bank of England (total reserves: LPMBL22, total assets via ECB: DD.A.GB.TA_DBG.PGDP.4F_N); Bank of Japan (total reserves: MD07'MAREM1, total assets: BS02'FAABK_FAAB2DBEAS); Swiss National Bank (reserves: EPB@SNB.snbbipo{GB} and EPB@SNB.snbbipo{GBI}, total assets: BSTA@SNB.MONA_U.BIL.AKT.T0T{U,T,T,A40}).

Naturally, increased banks' reserves coincide with increased central bank balance sheets (Figure 4) in this respect, the Swiss National Bank and the Bank of Japan stand out with a balance sheet surpassing 100 percent of GDP. The euro-area value of 41 percent is the third highest.

Figure 4: Central bank balance sheet, January 2006 – August 2018



Source: Bruegel based on balance sheet data: Federal Reserve Bank of St. Louis (BoJ: JPNASSETS, ECB: ECBASSETS, FED: WALCL, BoE: UKASSETS), Bank of England (RPQB75A) and Swiss National Bank (EPB@SNB.snbbipo{T0}); GDP: IMF (WEO), Eurostat [nama_10_gdp] and Swiss National Bank (EPB@SNB.gdpap{WMF,BBIP}).

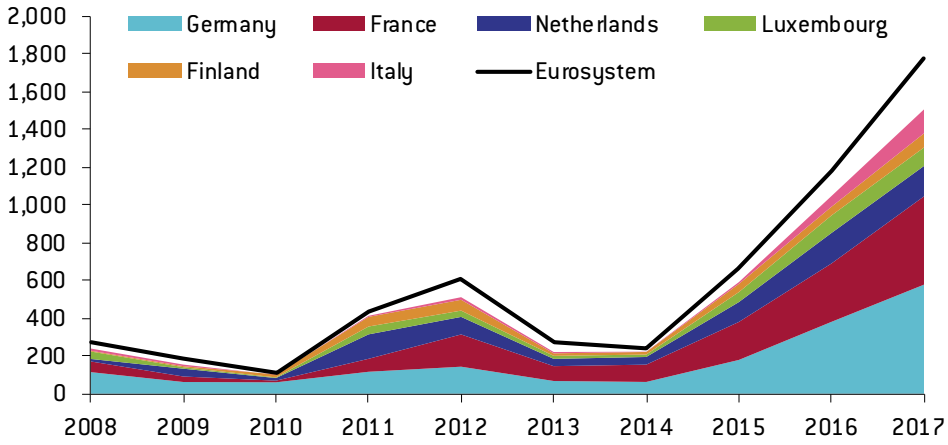
2.3 Drivers of banks' reserves in the euro area

Before the global financial crisis, the ECB implemented neutral liquidity conditions – just enough for banks to satisfy reserve requirements. It estimated the liquidity needs of the banking system each week and provided that amount of money in the form of loans to banks. The banks competed for these loans in an auction and the ECB ensured that the loans met the needs of the banking system as a whole. Once in the system, the liquidity was redistributed between the banks – via interbank lending – according to individual needs. As Figure 2 shows, excess liquidity was close to zero in this period.

But the ECB has fundamentally changed its liquidity provision since October 2008, when it introduced fixed-rate full allotment (FRFA) refinancing operations instead of the previous auctions. Under FRFA, banks can access unlimited reserves against eligible collateral, while collateral policy has been loosened by accepting a wider set of, and lower-rated, collateral (see Darvas and Merler, 2013). In this way, the ECB has allowed the accumulation of excess liquidity and has even incentivised it by making the conditions of its temporary operations more generous (eg increasing maturity or reducing the cost). Excess liquidity peaked in 2012, followed by a reduction to close to zero by late 2014, after which a huge increase followed.

The drivers of excess liquidity increase were rather different in the 2008-12 and the post-2015 periods. In the 2008-12 episode, because of the break down in normal interbank banking, excess reserves were driven by banks' increased demands for liquidity resulting from heightened risk, the demand being satisfied by the ECB and even incentivised by the generous ECB lending facilities. As financial markets normalised in 2013-14, banks' demands for excess liquidity reduced, resulting in a major decline in excess liquidity from its 2012 peak of close to €1,000 billion to less than €100 billion, along with the repayment of the three-year long-term refinancing operations.

Figure 5: Holdings of excess liquidity by country, € billions, 2008 – 2017



Source: Bruegel based on national central banks annual reports, ECB. Note: Holdings of excess reserves and deposit facility is considered, but fixed-term deposits are not considered and thereby the Eurosystem total does not correspond to the values indicated on Figure 2.

But since March 2015, the ECB's expanded asset purchase programmes (APP), which aims to increase inflation, has automatically created bank reserves[6]. This is because the increase

6 Certainly, the earlier asset purchase programmes, like the first two covered bond purchasing programmes of July 2009 and November 2011 (resulting in €60 billion purchases in 2009-10 and €16 billion purchases in 2011-12), the third covered bond purchasing programme of October 2014 and the November 2014 asset-backed securities programme also boosted banks' reserves, but these programmes were minor compared to the March 2015 public sector purchasing programme. See https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html.

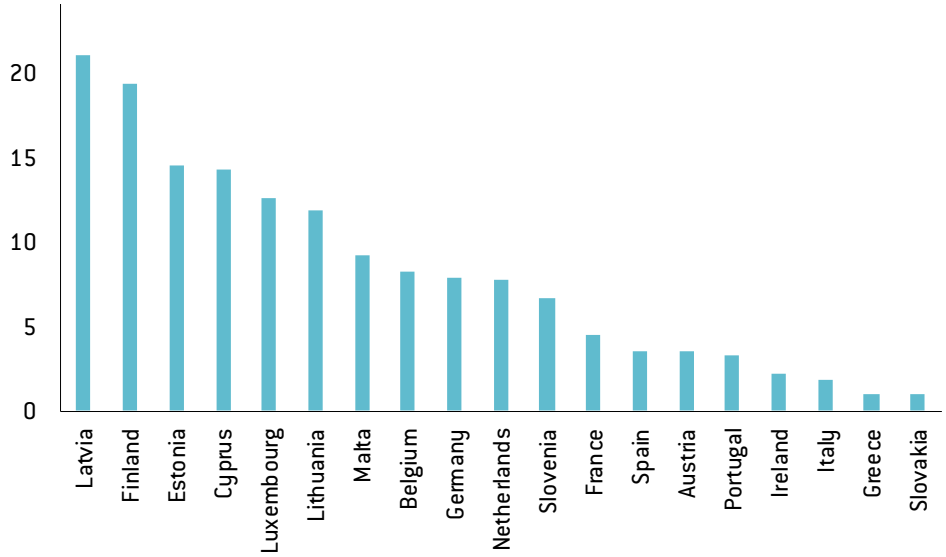
in assets held by the ECB must be compensated for by increased liabilities – essentially either cash or banks' reserves. We have already shown that the growth rate of currency in circulation has not accelerated and has even slowed recently when expressed as a share of GDP (Figure 1), and therefore banks' reserves must go up. To compensate for the asset purchase, the ECB credits the reserve accounts of banks held at the ECB. Thus, while in 2008-12 the increase in excess liquidity was driven by demand for liquidity arising from risk factors, since March 2015 the dominant reason has been the supply of reserves, reflecting the aim of the ECB to boost inflation.

It is important to highlight that excess reserves are concentrated in a few countries and in a few banks within countries. This aspect is crucial in the assessment of the possible impacts of excess reserves.

Figure 5 shows that five countries – Germany, France, the Netherlands, Luxembourg and Finland – account for approximately 80-90 percent of total excess liquidity holdings. Italian banks held almost zero excess liquidity before 2016 and have started to accumulate some excess liquidity more recently.

The uneven distribution of excess liquidity is even more striking when we relate it to banking system assets (Figure 6). In Latvia and Finland, this ratio is about 20 percent, a very high value compared to, for example, Italy's 2 percent ratio and Greece's and Slovakia's 1 percent ratio.

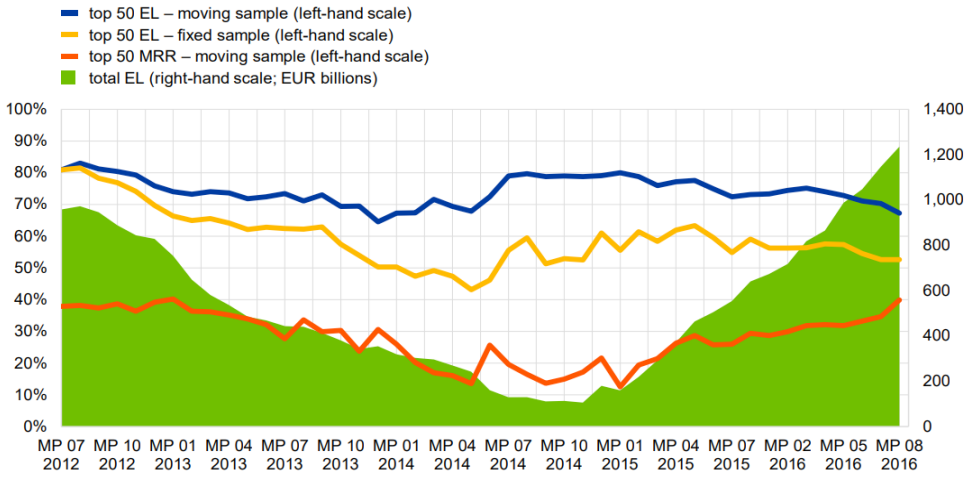
Figure 6: Holdings of excess liquidity by country, ratio to banking system assets, June 2018



Source: Bruegel based on ECB's Statistical Data Warehouse (banking system assets: BSI.M.*.N.A.T00.A.1.Z5.0000.Z01.E, current account: ILM.M.*.N.L020100.U2.EUR, deposit facility: ILM.M.*.N.L020200.U2.EUR, reserve base derived from balance sheet items L21, L22, L23, L40 and L41 in BSI.M.*.N.A.*.L.1.Z5.0000.Z01.E).

But excess liquidity holdings are not only uneven across countries, but across banks too. Figure 7, taken from Baldo *et al* (2017), shows that the top 50 excess-liquidity holding banks account for about 80 percent of total holdings (blue line), while the share of the same 50 banks in minimum reserve requirements is below 40 percent (red line). The roll call of banks in the top 50 excess-liquidity holders has changed little: the yellow line shows the share of the initial 2012 top 50 banks, which had declined only a little from 80 percent to 50 percent by 2016.

Figure 7: Holdings of excess liquidity by banks, 2012–16



Source: Eurosystem.
Notes: MP averages. The blue solid line shows the share of excess liquidity (EL) held by the top-50 institutions in each MP (i.e. the sample changes over time). The red line shows the share of the minimum reserve requirement (MRR) of these institutions. The blue dashed line shows the share of EL held by those institutions that were the top-50 EL holders in MP 07 2012.

Source: Chart 4 of Baldo *et al* (2017).

Baldo *et al* (2017) studied the reasons for concentration of excess reserve holdings. At the country level, the main reason is that the bulk of asset purchases were from counterparties whose head institutions were domiciled outside the euro area and whose liquidity is kept in accounts in certain euro-area countries, such as Germany and Luxembourg. Additionally, non-euro area investors were the main original sellers of euro-area government bonds; these investors manage their euro holdings in a few euro-area financial centres. Thus, the same factors that explain the build-up of Target-2 balances explain the uneven distribution across countries of excess liquidity.

A further explanation for the concentration could be that banks in lower-rated, and therefore higher-yield, countries may reinvest their reserves in sovereign bonds.

In terms of concentration of excess reserve holdings at the bank level, Baldo *et al* (2017) found, based on a survey of bank treasurers, that the most important factors are the bank business model and the related liquidity management strategy, followed by regulatory requirements and risk management policies. In particular, the survey showed that investment banks and clearing institutions tend to hold more excess liquidity than retail and wholesale banks. Smaller banks tend to hold more excess liquidity because they are less equipped to reinvest funds in the capital market. Better-capitalised banks tend to hold more excess liquidity because they attract more liquidity inflows. Banks with higher non-performing loan (NPL) ratios tend to hold more excess liquidity for precautionary reasons. Banking groups tend to concentrate excess liquidity at the group head office. And finally, Baldo *et al* (2017) also found that the leverage ratio, the liquidity coverage ratio and the net stable funding ratio might hinder the circulation between banks of excess liquidity.

3 Bank lending risks

The current -0.4 percent negative ECB deposit rate applied to more than €1,900 billion in banks' excess liquidity implies a €7.6 billion direct annual cost to those banks that hold the excess liquidity. To put this number into perspective, Table 1 compares the implied annual

cost by country to profits and bank equity in 2017. Note that the 2017 profits already include the direct cost effect of the negative ECB deposit rate.

Table 1: Direct costs from the negative ECB deposit rate and banks' profits in 2017, € millions

	Implied annual direct cost of negative ECB deposit rate (considering June 2018 holdings of excess liquidity)	Bank profits in 2017	Implied annual direct cost as share of bank profits in 2017 in % (Column2/ Column3)	Total bank equity in 2017	Implied annual direct cost as share of total bank equity in 2017 in % (Column2/ Column5)
Austria	117	5,721	2.0	63,969	0.18
Belgium	344	7,812	4.4	75,026	0.46
Cyprus	44	-722	-6.1	5,591	0.78
Estonia	15	599	2.5	3,743	0.40
Finland	364	1,921	18.9	22,106	1.65
France	1,606	29,349	5.5	458,001	0.35
Germany	2,484	10,425	23.8	382,251	0.65
Greece	13	-450	-2.8	34,715	0.04
Ireland	97	4,689	2.1	64,575	0.15
Italy	281	15,293	1.8	215,778	0.13
Latvia	21	210	9.8	3,220	0.64
Lithuania	13	367	3.6	2,565	0.52
Luxembourg	529	3,502	15.1	62,033	0.85
Malta	17	306	5.6	3,542	0.48
Netherlands	754	13,463	5.6	147,630	0.51
Portugal	54	-1,035	5.2	36,096	0.15
Slovakia	3	347	0.9	5,907	0.06
Slovenia	11	494	2.2	4,971	0.22
Spain	391	18,606	2.1	261,964	0.15

Source: Bruegel based on ECB's Statistical Data Warehouse (current account: ILM.M.*.N.L020100.U2.EUR, deposit facility: ILM.M.*.N.L020200.U2.EUR, reserve base derived from balance sheet items L21, L22, L23, L40 and L41 in BSI.M.*.N.A.*.L.1.Z5.0000. Z01.E; return on equity: CBD2.A.*.W0.11._Z._Z.A.A.I2003._Z._Z._Z._Z._Z.PC, equity: CBD2.A.*.W0.67._Z._Z.A.F.LE000._X.ALL.CA._Z.LE._T.EUR). Note: Implied annual costs are calculated based on excess liquidity held by monetary financial institutions in a given country multiplied by the deposit facility rate of -0.4 percent; Profits are derived indirectly through the return on equity.

The direct cost arising from the negative ECB deposit rate is generally small compared to the overall profits banks made in 2017, with perhaps the exceptions of Germany and Finland, where the cost accounts for about one-quarter and one-fifth of profits, respectively (Table 1). As a share of equity, the direct cost of excess liquidity is highest in Finland with 1.65 percent, followed by 0.85 percent in Luxembourg, 0.78 percent in Cyprus and about 0.65

percent in Germany and Latvia. These values are relatively large in our view. However, for most other countries, the drag on profit rates is rather small (eg in Italy and Spain it is around 0.15 percent). Moreover, the negative ECB deposit rate along with other measures such as asset purchases have various impacts that might compensate for each other. For example, as argued by Gros (2016), Blot and Hubert (2016) and Demertzis and Wolff (2016), these measures impact banks' profits by:

- Reducing profits because of the direct cost arising from the negative ECB deposit facility rate;
- Lowering both short and long-term interest rates, and presumably the spread between them, which can reduce the loan-to-deposit interest rate margin, thereby lowering bank profits;
- Driving up asset prices, so banks that hold such assets benefit;
- Improving the economic situation and outlook, thereby increasing the credit worthiness of bank borrowers, cutting the volume of non-performing loans and thereby loan-loss provisions, and creating new lending opportunities, all of which boost bank profits.

Altavilla *et al* (2017) comprehensively analysed the link between monetary policy and bank profits in a low interest rate environment. They concluded that the overall impact of monetary policy measures was either muted or even positive for bank profits: a positive impact on loan-loss provisions and non-interest income largely offset the negative impact on net interest income (including the cost of holding negative excess reserves at the Eurosystem)[7]. Still, beyond the overall muted or positive effect, the direct marginal negative effect of negative interest rates might induce banks to invest in risky projects. Furthermore, while liquidity was a constraint prior to the ECB's unconventional measures, large liquidity buffers allow banks to expand the issuance of loans more easily and therefore banks could be more inclined to reach for additional revenues. And more generally, in a low interest rate environment, investors including banks might search for yields and engage in riskier business.

We therefore analyse indicators which are informative about possible risk taking by banks. We start by looking at the overall financial cycle to see if euro-area banks are still in a deleveraging phase, in which case excessive risk taking is less likely. We than analyse the overall risks taken by banks, as reflected in risk-weighted assets. We also look at the growth rate of lending volumes and the increase in house prices in comparison to earlier episodes of house-price bubbles. Finally, we summarise macroprudential reports by the European Systemic Risk Board (ESRB) and national macroprudential authorities.

3.1 Financial cycle

The financial cycle has a major impact on banks' ability and willingness to take risks. In the upward phase of the financial cycle, which used to coincide with improved economic outlook, banks expand their activities and are open to more risk. But in the deleveraging phase of the financial cycle, banks are more cautious and typically work to improve their capital positions by reducing their activities and risks.

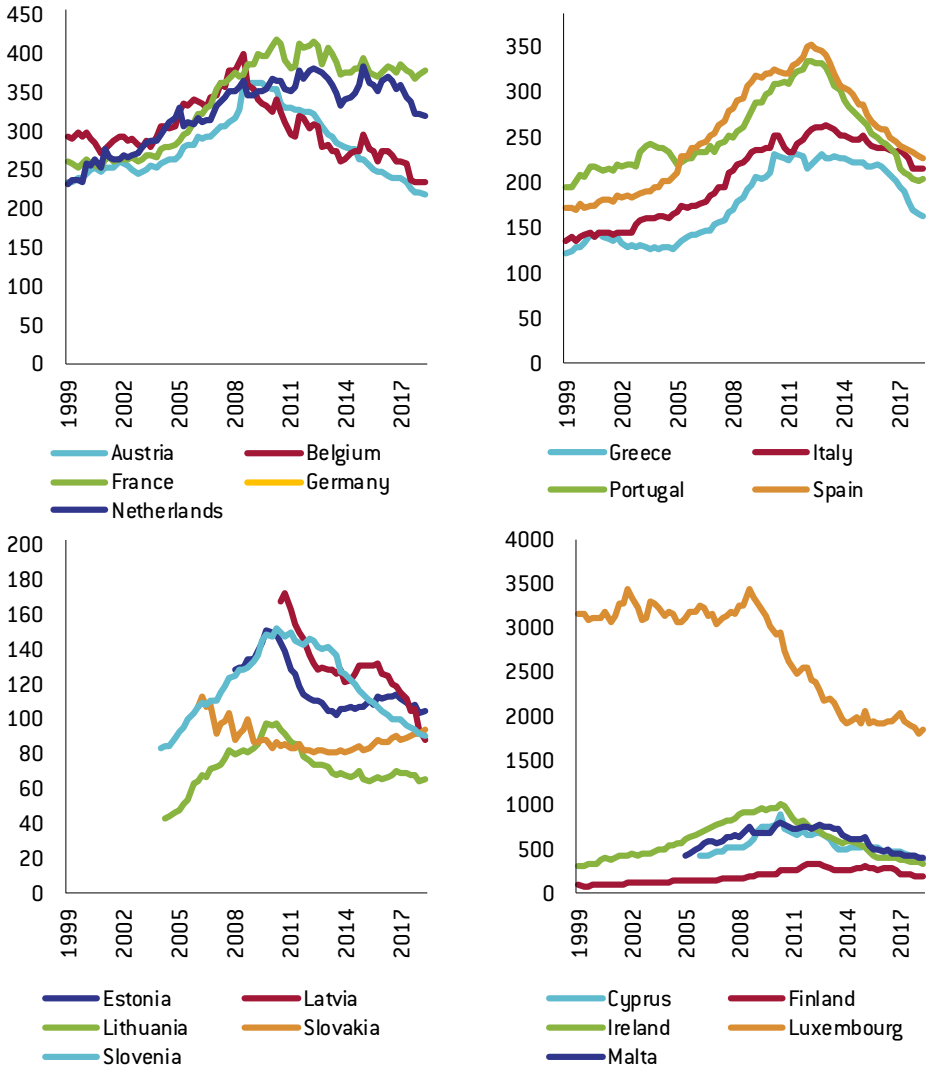
As Merler (2015) found, euro-area countries were characterised by divergent financial cycles after the launch of the euro, with major implications for macroprudential policy. We do not repeat her exercise to precisely measure the dating of the financial cycle, but we show the evolution of bank's balance sheets as a ratio to GDP, which is a good indicator for the cycle (Figure 8).

Most euro-area countries are at time of writing still in a deleveraging phase, with the main exception of Slovakia (where bank balance sheets as a share of GDP are expanding), and France, Estonia and Lithuania, where this ratio is broadly stable. But in the other fifteen euro-area countries bank balance sheets continue to contract and the pace of the contraction

7 See slide 24 of Rostagno *et al* (2016).

is rather fast in most of these countries. This suggests that the overall risk appetite of banks could be low.

Figure 8: Total bank assets (% GDP), 1999Q1-2018Q2



Source: Bruegel based on ECB's Statistical Data Warehouse (total banks assets: BSI.M.*.N.A.T00.A.1.Z5.0000.Z01.E) and Eurostat (GDP: [namq_10_gdp]).

3.2 Risk-weighted assets

Risk-weighted assets relative to total assets is a direct regulatory measure of the risks taken by banks. The safer the asset, the lower the risk weight, with the safest assets having a zero risk weight.

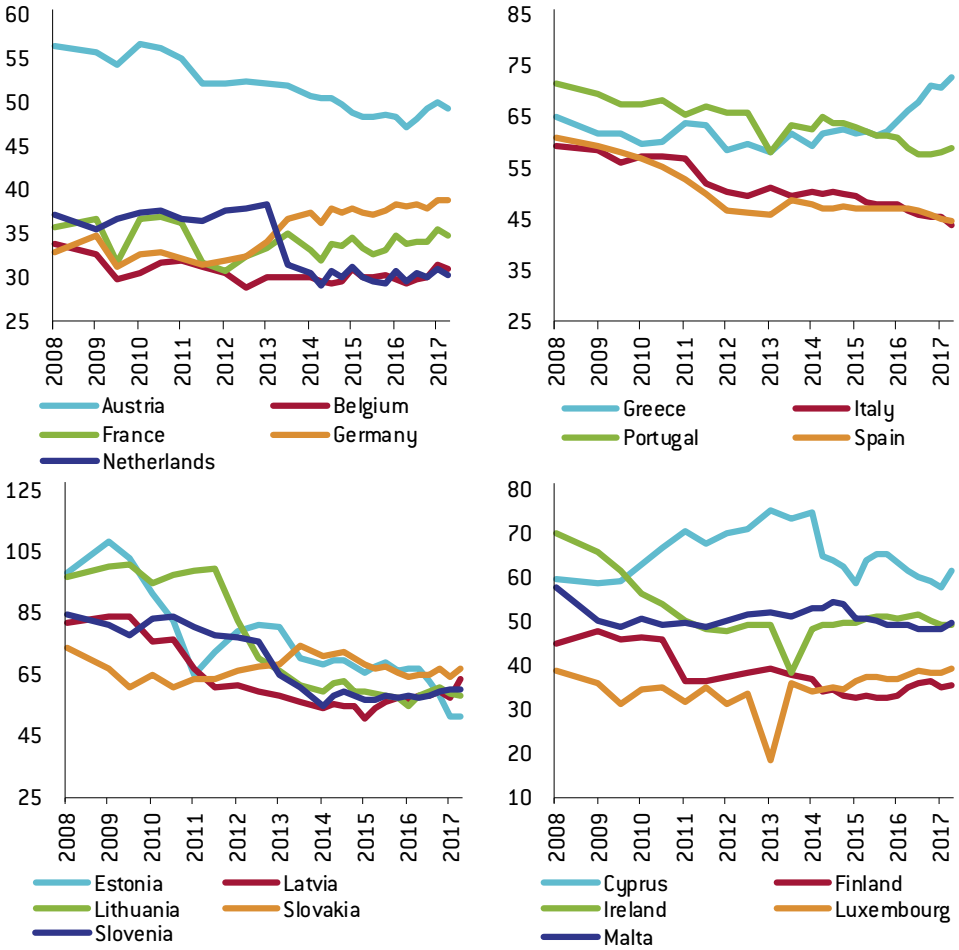
There is an important exception, however. Sovereign bonds are weighted with zero weight in EU regulations and thereby the EU does not comply with Basel III. The zero risk weight of sovereign securities in bank portfolios implies that if the share of such securities on bank balance sheets increases – a phenomenon that was observed in the crisis years in a number of countries – the ratio of risk-weighted assets to total assets will decline, even if sovereign securities carry risk[8].

Figure 9 shows that in a number of countries the ratio of risk-weighted assets to total assets either continues to decline or remains broadly stable. The notable exceptions are Greece, where a steady increase since early 2015 can be observed. Since Figure 9 considers the total balance sheet, in the Annex we separate out only those balance sheet items that are

8 *"Exposures to Member States' central governments, and central banks denominated and funded in the domestic currency of that central government and central bank shall be assigned a risk weight of 0 %"* (CRR, article 114(4)). See more details in Annex I of Véron (2017).

subject to credit, counterparty credit, dilution and delivery risks (Figure 15 in the Annex). The conclusion from this narrower aggregate largely mimics the results from the total assets: riskiness is either declining or remains broadly stable, with only minor increases observed in some countries. Interestingly, while total risk-weighted assets are increasing in Greece, the assets exposed to credit, counterparty credit, dilution and delivery risks are not.

Figure 9: Risk-weighted bank assets (% total bank assets), 2008Q4-2018Q1



Source: Bruegel based on ECB's Statistical Data Warehouse (RWA: CBD2.Q.*.W0.11._Z._Z.A.A.I4011._Z._Z._Z._Z._Z.PC). Note: lower value indicates lower risk.

The possible reasons for the fall in risk-weighted assets could be:

- Compositional (eg increased shares of sovereign exposure in banks' portfolios);
- The credit-rating upgrade of companies, which might result from impact of the improved overall economic outlook on company outlook;
- NPLs are gradually being worked down, which also reduces the riskiness of bank balance sheets;
- Many banks are still in a deleveraging phase (Figure 8) and these banks might reduce their riskier exposures first in order to improve their capital adequacy;
- Some banks could be still cautious, eg an ECB survey[9] found that one reason for hoarding excess liquidity is that banks' investment decisions remain subject to strict internal risk limits; and
- The implementation of new regulations. For example, the Basel III regulation introduced

9 The ECB conducted a survey of 68 bank treasurers about their excess liquidity holdings. Details are presented in Baldo *et al* (2017).

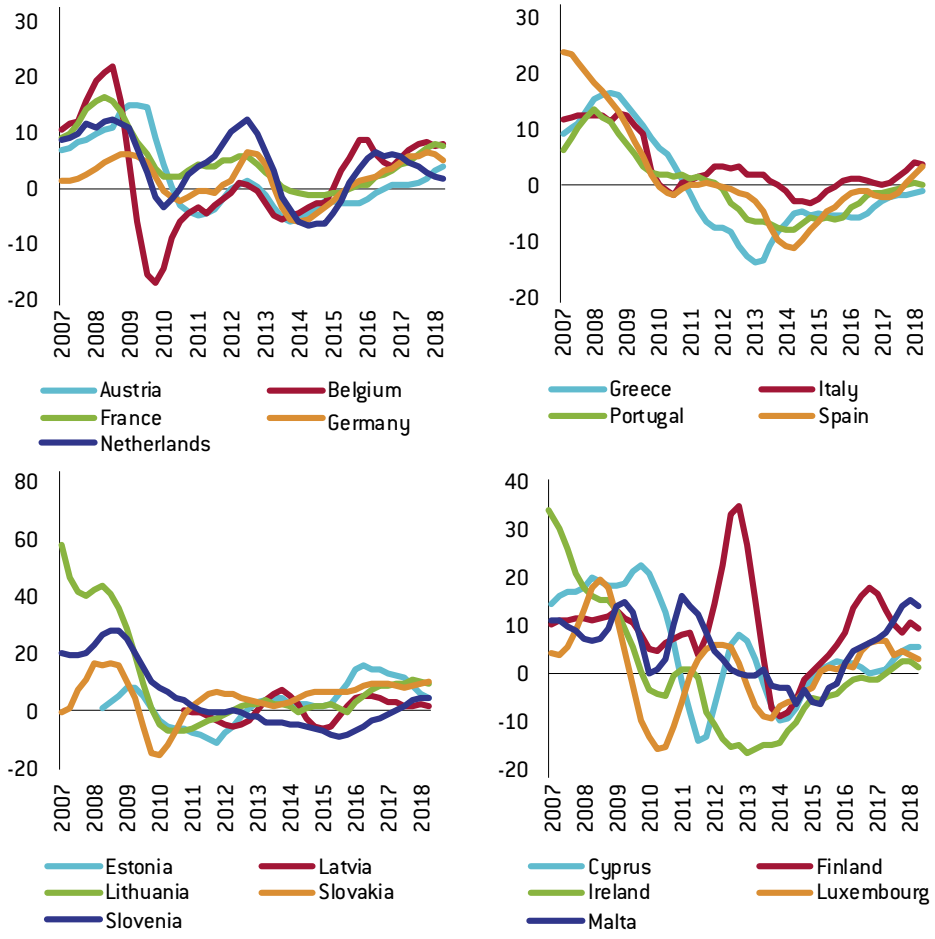
a global liquidity requirement framework which encompasses the liquidity requirement ratio (LCR) as well as the net stable funding ratio (NSFR).

Therefore, the overall conclusion from the regulatory risk weights is that the riskiness of bank balance sheets – as reflected in micro-prudential credit weights – has either declined or remained broadly stable during the period of ultra-loose monetary policy.

3.3 Bank lending growth and levels

Previous episodes of high risk-taking by banks were often characterised by strong growth of bank lending. While the issuance of loans is strongly pro-cyclical, it is crucial to monitor whether lending becomes excessive and therefore poses the risk of creating a bubble. Figure 10 shows that there has been a general increase in the overall lending growth rate throughout the euro area, with the exception of Greece where credit growth is still negative. There is a significant variation between euro-area countries, both in terms of level and dynamics. In terms of levels, lending growth ranges from minus 1 percent in Greece to 14 percent in Malta, with the average euro-area value at 3 percent. In terms of dynamics, most countries see a steady increase in credit growth rates, yet in the Netherlands, Estonia and Finland lending growth rates peaked in 2016 or early 2017 and there has been a decline since then. Therefore, the observation of Merler (2015) about the diverging financial cycles of euro-area countries continues to apply.

Figure 10: Annual growth rates nominal bank lending to euro area (% change compared to the same month of the previous year), 2007Q1-2018Q2



Source: Bruegel based on ECB's Statistical Data Warehouse (lending: BSI.M.*.N.A.A20.A.1.U2.0000.Z01.E and BSI.M.*.N.A.A20.A.4.U2.0000.Z01.E). Note: Outstanding stocks are calculated based on flows and stock level in 2013 Q4; 4-quarter moving average.

We also looked at the two main components of lending: to households (Figure 16 in the Annex) and to non-financial corporations (NFCs) (Figure 17 in the Annex). For household loans we also indicate the historical growth rates observed during housing boom periods. Thus, the difference between a country's growth rate and this historical benchmark serves as a risk indicator of whether a country potentially faces a real-estate bubble.

Household loan growth remains subdued in most euro-area countries, which is in line with our earlier finding that in most euro-area countries, banks are still in a deleveraging phase. In particular, banks in southern euro-area countries are reducing their loans to households in real terms. Bank loans to French, German and Dutch households increased at an average annual rate of around 3-5 percent between 2013 and 2018, which is well below the suggested real-estate bubble trajectory.

However, there are two key exceptions, Belgium and Slovakia, where bank lending to households has increased rather rapidly recent years, similarly to previous run-ups to real-estate bubbles. This might suggest a potential danger. However, credit standards have actually been tightened significantly in Slovakia and somewhat in Belgium for household loans (Figure 18), implying that banks aim to contain their risks.

Figure 11: Loans to households in the euro area (% of GDP), July 2018

Source: Bruegel based on ECB's Statistical Data Warehouse (lending: BSI.M.*.N.A.A20.A.1.U2.2250.Z01.E) and Eurostat (GDP: nama_10_gdp). Note: based on GDP in 2017.

Moreover, the indebtedness of both countries' households is still below the euro-area average (Figure 11) and therefore the increase in indebtedness might not lead to excessive household debt. And, this increased lending has not (yet) translated into a significant increase in house prices in Belgium (Figure 12 in section 3.4), again suggesting that the situation might not be a bubble. However, there has been rapid house-price inflation in Slovakia.

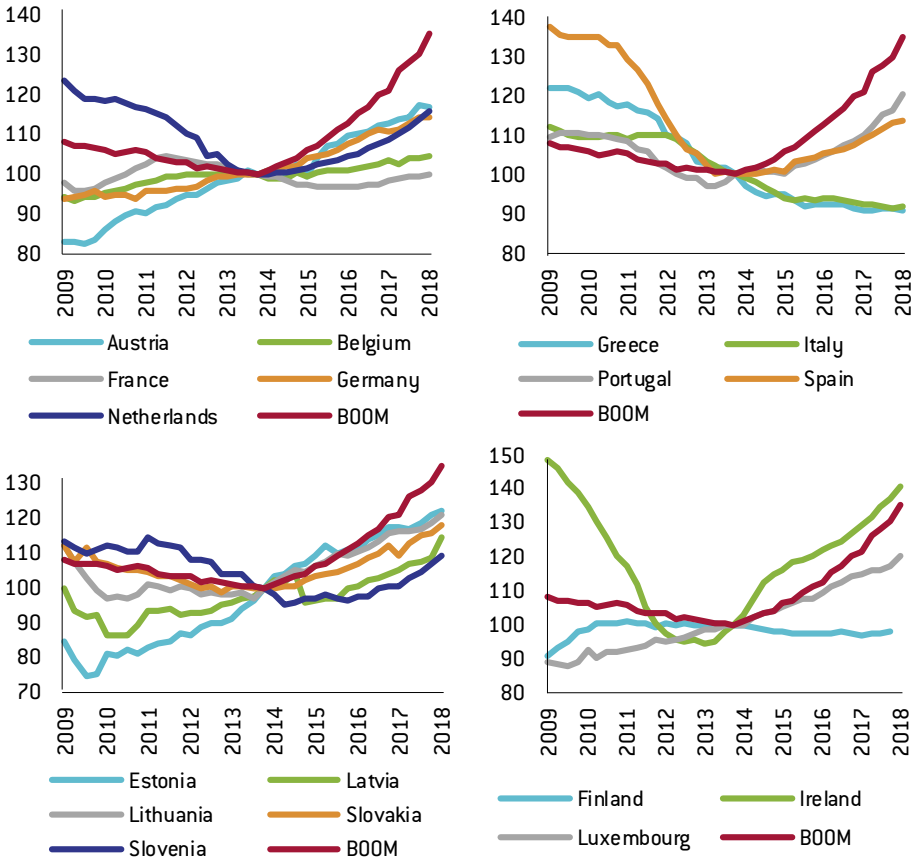
Bank lending to non-financial corporations measured at constant pricescontinues to contract in Cyprus, Greece, Italy, Ireland, the Netherlands, Portugal, Slovenia and Spain, while in the other euro-area countries the growth rates in excess of inflation are below 4 percent per year on average, which does not seem disproportionate in relation to the observed increase in economic activity (Figure 17). These developments suggest again that the speed of credit growth is not excessive.

3.4 Housing markets

The housing market has frequently been a source of financial instability. When a rapid house-price increase is fuelled by credit growth, an unexpected reversal of house prices might render borrowers insolvent, causing bank losses. Figure 12 shows that in some countries the house-price growth rate is not far from what was witnessed during the build-up of past real-estate bubbles. In Ireland, the growth rate since 2013Q4 is outperforming earlier house-price booms. The growth

rate is also relatively fast in countries including Estonia, Lithuania, Luxembourg and Slovakia. The rapid growth of house prices should be a concern from the perspective of financial stability, but as we indicated in the section 3.3, these house-price increases are not boosted by lending growth in most countries, which implies that the financial stability implications of an eventual house-price bust would be less severe. Of these five countries, bank credit standards for household loans have been loosened only in Luxembourg since 2014, but has been tightened in the other four countries (Figure 18), suggesting again that banks might aim to contain their risks.

Figure 12: Real house price index (2013Q4=100), 2009Q1-2018Q1



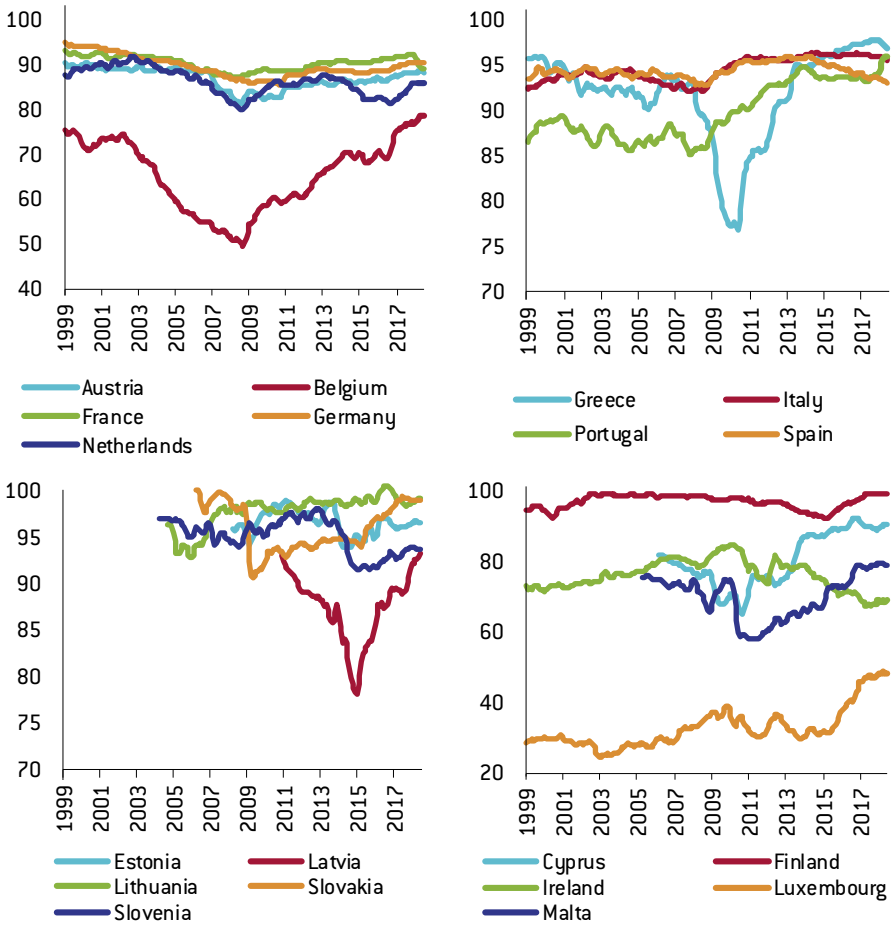
Source: Bruegel based on OECD (Real house price indices, seasonally adjusted); Boom growth rates based on Rostagno *et al* (2016) estimates. Note: Real house price index unavailable for Cyprus and Malta.

3.5 Home bias

Before the global financial crisis, many euro-area banks increased their exposure to other euro-area countries, non-euro EU countries and also non-EU countries. From a financial stability point of view this diversification was desirable, because it diversified the risks that banks face and an eventual downturn of the home economy (which still remains the most significant exposure of banks) would have a lesser impact on bank balance sheets. However, this trend reversed in most countries after the start of the global (2007) and euro-area (2010) crises and the reversal has continued in more recent periods. Thus, the exposure of banks to their home countries has increased, raising concerns about concentration of risk.

Ireland, Slovenia and Spain are exceptions to this trend, though the concentration in Spain and Slovenia (93 percent of euro-area loans are granted to the home economy) remain very high; less so in Ireland (68 percent). While the drivers for banks in Ireland and Slovenia are mainly their lending to monetary financial institutions (MFI) in other euro-area countries, Spanish banks supplied more loans to the foreign private sector.

Figure 13: Home bias: bank loans to domestic sector (% total loans to euro area), 1999Q1-2018Q2



Source: Bruegel based on ECB's Statistical Data Warehouse (domestic loans: BSI.M.*.N.A.A20.A.1.U6.2000.Z01.E and total loans to euro area: BSI.M.*.N.A.A20.A.1.U2.0000.Z01.E). Note: Resident credit institutions include resident branches of institutions headquartered abroad, but exclude foreign branches of resident institutions.

Similarly to loans, the bias towards domestic debt securities gradually declined during the expansionary periods of the early 2000s, but increased sharply with the financial crisis around 2007-12. However, this trend reversed for central European countries around 2013 and for most southern European countries one year later when the banking sector started to increase the shares it held of non-euro dominated debt securities. A possible reason for this could be monetary tightening in the US, UK and other non-euro area countries, which increased the yields of those countries' fixed-income securities.

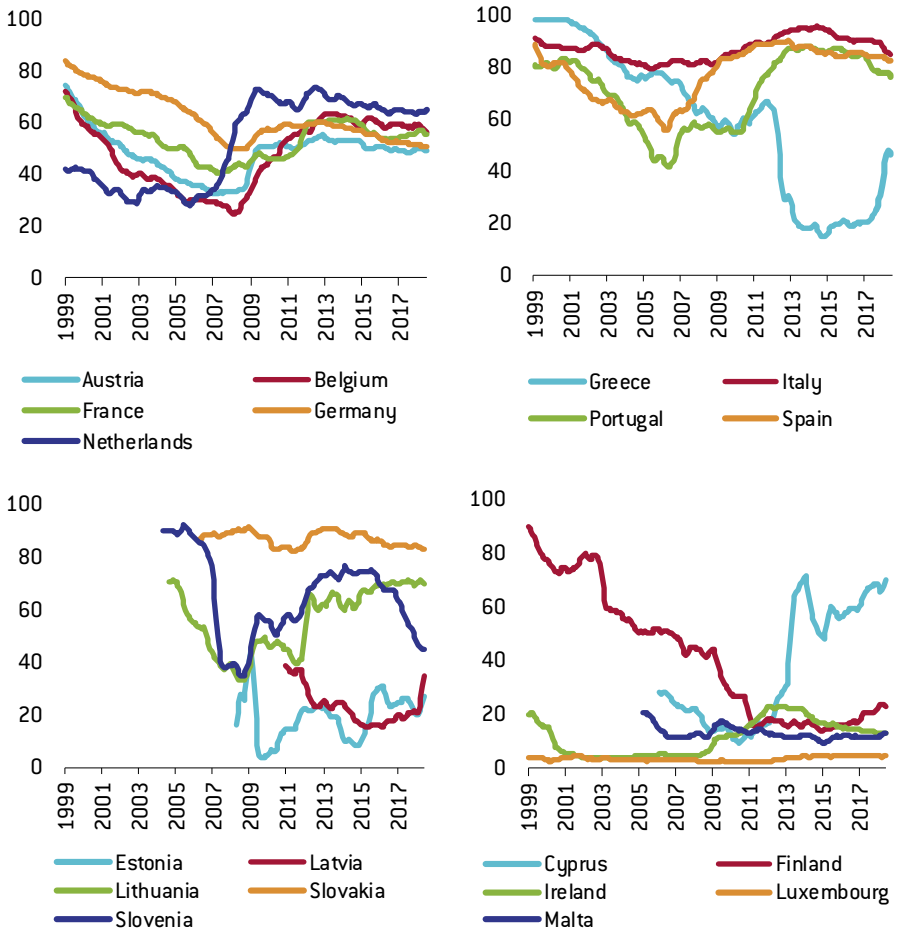
It is interesting to note that the general holdings of debt securities have decreased significantly both in nominal terms and measured as a share of total assets[10]. Banks in Germany, France and the Netherlands reduced their domestic debt securities holdings as a share of total assets from around 20 percent in 2010 to close to 13 percent in 2018. The accumulation of excess reserves as a result of the ECB's liquidity injections in these jurisdictions could be one possible explanation. However, Italy and Spain, where the banking

10 Valuation effects play an important role when analysing bank balance sheet items such as debt securities. The ECB's Statistical Data Warehouse also provides an index of the respective items, which controls for changes in prices (debt securities issued by MFIs: BSI.M.*.N.A.A30.A.I.U6.1000.Z01.A and non-MFIs: BSI.M.*.N.A.A30.A.I.U6.2000.Z01.A). These indices confirm an active reduction in domestic debt securities of banks in Italy and Spain since 2014 and German and French banks since 2011. See series mentioned above for details for other countries.

sectors only started to hold excess liquidity from the end of 2016, scaled down their holdings of debt securities from 24 percent and 20 percent respectively to 17 percent in both cases. This however, is still well above the pre-crisis level of 10 percent.

Thus, although home bias in debt securities holdings increased sharply in the aftermath of the crisis, banks in most countries are not only reducing holdings of domestically issued bonds but also their debt securities holdings overall, potentially as a result of ECB liquidity provision.

Figure 14: Bank's domestic debt securities holdings (% total debt securities), 1999Q1-2018Q2



Source: Bruegel based on ECB's Statistical Data Warehouse (debt securities issued by domestic non-MFIs: BSI.M.*.N.A.A30.A.1.U6.2000.Z01.E and MFIs: BSI.M.*.N.A.A30.A.1.U6.1000.Z01.E; total debt securities: BSI.M.*.N.A.A30.A.1.Z5.0000.Z01.E). Note: Resident credit institutions include resident branches of institutions headquartered abroad, but exclude foreign branches of resident institutions.

3.6 Macroprudential assessments

Macroprudential reports by national authorities suggest that the overall risk to financial stability remains low, though they highlight certain vulnerabilities. While most reports signal that one would expect greater broad-based risk-taking under the current monetary framework, little evidence of such behaviour is put forward. Many reports consider one of the main risks of the current low interest rate environment for banks/financial system to be an abrupt price reversal.

In some countries certain vulnerabilities have been highlighted and macroprudential measures adopted. For example, countercyclical capital buffers (CCyBs)[11] were adopted in

11 The CCyB is aimed to strengthen the banks' resilience in the event of an increase in the cyclical systemic risks (eg in the case of excessive credit growth).

France, Ireland and Slovakia. The capital buffer for other systemically important institutions (O-SIIs) was increased in almost all countries with notable exceptions of Italy and Spain (Table 2). We also noted (Section 3.1) that Italian and Spanish banks are still in a rapid deleveraging phase.

It also important to highlight that the Belgian and the German reports argued that risk-weighted assets (RWA) and other indicators might not sufficiently reflect inherent risks or might overlook systemic risks.

Table 2: Implemented or proposed macroprudential instruments in 2018

	Macroprudential measures
Belgium	Additional measures targeting the real estate market (buffer amounting to €1.5 billion of common equity Tier 1 capital) CCyB kept at 0% Buffers from 0.75% to 1.5% for systematically important banks
Finland	Systemic risk buffer between 3%-1.5% for Nordea, Op Group and Municipality Finance Plc and 1% for other Finnish credit institutions (July 2019)
France	Capping exposure of systematically important French banks to large, highly indebtedness domestic companies to 5% of eligible capital (July 2018) CCyB to be set at the moderate rate of 0.25% (July 2019)
Germany	Capital buffer for systemically important institutions (2% of risk exposure); implementation by January 2019 CCyB kept at 0%
Ireland	CCyB to be raised to 1% (in July 2019) Capital buffer for systemically important institutions to take effect in 2019, ranging from 0 to 0.5% and rising to 1.5% by 2021 for certain banks Mortgage-specific measures remain in place, slightly tightened (20% of the value of new mortgage lending to first-time borrowers and 10% of the value of lending to second/subsequent-borrowers can be above the loan-to-income cap (currently 3.5)
Italy	No change: CCyB kept at 0%
Netherlands	Advised further reduction of loan-to-value ratio (LTV) from 100% (no time frame) No change to CCyB (kept at 0%)
Slovakia	CCyB increased to 12.5% from August 2018, up from 0.5% from August 2017 A capital conservation buffer (CCoB) – fully phased in since 1 October 2014 Capital buffer for systemically important institutions– being phased in between 2016 and 2018 Debt-to-income (DTI) ratio limits and tighter loan-to-value (LTV) ratio limits
Spain	No change (CCyB kept at 0%)

Source: Bruegel based on Banca d'Italia (2018), Banco de España (2018), Banque de France (2018), Bundesbank (2017), Central Bank of Ireland (2018a,b), De Nederlandsche Bank (2018), Národná banka Slovenska (2018) and National Bank of Belgium (2018).

We take a closer look at Belgium, Ireland and Slovakia, three countries for which we have identified rapid credit or house-price growth in recent years. In our assessment, the three central banks have adopted appropriate measures to address the underlying risks.

Belgium

The National Bank of Belgium's Financial Stability Report (2018) argues that "*The robust financial position of the Belgian financial sector also provides a solid foundation to tackle major, and more structural, challenges in the future, such as the current low interest rate environment and the uncertainty surrounding a possible shift in monetary policy…*" (page 7).

Notwithstanding this overall positive assessment, the report highlights the process of broad-based risk-taking resulting from low interest rates: "*In their search for yield to offset this downward pressure on profitability, Belgian banks are gradually opting to take on more interest rate and credit exposures, using higher maturity transformation and fixed-rate loan volumes as potential ways of compensating (at least partly) for the downward pressure on the net interest income margin stemming from repricing in fixed-income assets. Banks are also gearing their business models towards activities that generate non-interest income, particularly fees and commissions related to asset management business, which may expose them to step-in and reputational risks.*" (page 63)

Concerning the real-estate sector, the report argues that "*Exposure to mortgage loans remains high while the inherent risks are not necessarily sufficiently reflected in the microprudential risk weighting. On average, mortgage loans represent around 20% of the banking sector's total assets, while loan growth remains dynamic. Furthermore, a portion of these loans is risky.*" (page 8).

While the report argues that "*there are currently no signs of any excessive accumulation of risks"* (page 8) and thereby the countercyclical capital buffer (CCyB) is kept at 0 percent, two other measures have been introduced:

- The requirement to create a buffer amounting to about €1.5 billion, made up of common equity Tier 1 capital (CET 1), to tame the risk coming from the strong mortgage credit growth rate, the increase in the Belgian household indebtedness ratio, a possible moderate overvaluation of property and a certain relaxation of lending standards; and
- Capital surcharges ranging from 0.75 percent to 1.50 percent depending on the systemic importance of the bank, to contain systemic risk.

Ireland

As we noted in Sections 3.3 and 3.4, Ireland is experiencing a very rapid increase in house prices but without an expansion of credit. While the Central Bank of Ireland (2018b) concludes that both the level of house prices and the loan/income ratio of households are currently in line with economic fundamentals[12], it sees the potential of excessive increases if recent trends continue:

- House prices: "*house prices having gone from being below what might have been expected given macroeconomic developments to now being roughly in line with economic fundamentals. Accordingly, the cyclical risk of house prices moving ahead of fundamental values is now more elevated than in recent years.*" (page 2);
- Household credit: "*The sustained contraction in credit seen for much of the last decade ended in recent months. While aggregate credit growth is close to zero, continued deleveraging in the SME and buy-to-let sectors obscures positive growth in home loans, consumer lending and loans to large enterprises. … Research indicated that the ratio of new mortgages lending to household income in Ireland to be broadly consistent with key structural factors. However, a significant acceleration in the new lending would increase the cyclical risk.*" (page 2).

With a view to this potential real-estate market vulnerability, and with the risk of a more general build-up of cyclical systemic risk, which might potentially arise "*from an external*

12 See a more detailed assessment in Central Bank of Ireland (2018a).

shock" (page 1), the Central Bank of Ireland (2018b) has increased the CCyB rate on Irish exposures from 0 percent to 1 percent effective from 5 July 2019.

Slovakia

Slovakia is the only euro-area country in which total banks assets are expanding as a share of GDP (Figure 8), though from a low level, and thus the annual growth rate of bank credit is relatively high at 10 percent in June 2018. Among the two main components of credit, household credit is growing at very dynamic rate, similarly to historical credit booms (Figure 16).

Národná banka Slovenska (2018) concludes that "*Housing loan growth in Slovakia remains the highest in the EU and indebtedness is elevated. Household borrowing growth is outpacing economic fundamentals.*" (page 18). These developments are assessed as the principal risk to financial stability. In terms of the reasons for these developments, the report cites both demand and supply factors. Demand is boosted by "*the exceptionally benign macroeconomic environment, and in particular by the gradual overheating of the labour market*" (page 18). Increased supply is related to the low interest rate environment: "*Lending growth is closely related to interest margin compression*" (page 41), because banks robustly increase their lending in order to offset the impact of falling interest margins, primarily driven by significant banks, given that less significant banks have a weaker competitive position due to their higher credit risk and higher cost of funding.

Furthermore, the report concludes that "*Compared with the past, liquidity risk has increased to an elevated level. The rapid rise in total loans – assets that are predominantly long-term and illiquid – is to a large extent funded by customer deposit.*" (page 7).

As a result, the Národná banka Slovenska has introduced a number of macroprudential measures to address the risks from low interest rates and the impact of accommodative monetary policies[13]:

- A capital conservation buffer (CCoB) – fully phased in since 1 October 2014;
- An additional capital buffer requirement applied to O-SII banks on grounds of their systemic importance – being phased in between 2016 and 2018;
- The introduction of a non-zero countercyclical capital buffer (CCyB) rate of 0.5 percent from 1 August 2017, rising to 1.25 percent from 1 August 2018; and
- Introduction of debt-to-income (DTI) ratio limits and tighter loan-to-value (LTV) ratio limits – which entered into force on 1 July 2018.

4 Concluding remarks

Low interest rates, which partly result from the ECB's negative deposit facility interest rate and large-scale asset purchases, act as a drag on bank profitability, given that such monetary policy measures narrow the spread between short-term and long-term rates and the spread between banks' lending and deposit rates. At the same time, excess liquidity held by banks at the Eurosystem exceeded €1,900 billion, or 17 percent of euro-area GDP, in September 2018. This involves direct costs for banks given that the ECB charges its negative interest rate on excess liquidity. These impacts might create incentives for banks to engage in risky lending.

However, our analysis reveals a more nuanced picture. Euro-area excess liquidity is not extraordinary in a global context and is in fact small compared to Japan, Switzerland and the United States. It is highly concentrated in a few countries and in a few banks and thus cannot be an incentive for countries and banks that hold very little, but only for those that hold a lot. The direct cost of holding excess liquidity as a share of bank equity is relatively low in most euro-area

13 See page 8 of Národná banka Slovenska (2018).

countries, though noteworthy for some. And if it did provide an incentive for greater risk-taking, it would already have been demonstrated through bank lending to riskier businesses, but we do not observe such developments in most of the euro area. Therefore, we conclude that excess liquidity is not the best indicator to represent the incentives banks have to take on more risk.

Our analysis of bank lending suggests muted risks. The overall credit growth rate in the euro area was a mere three percent in July 2018 (compared to the same month of the previous year), which is below the growth rate of nominal GDP. In most euro-area countries banks are still deleveraging, implying that their risk appetites could be low. However, the euro area remains heterogeneous in terms of the financial cycle and there are a few countries where either the rate of credit growth or the rate of house-price increases has accelerated. Our review of macroprudential reports by national central banks suggests that various aspects of the risks have been carefully analysed at the national level and various macroprudential measures have been introduced in several countries to tame potential risks to financial stability.

The more general question that arises from our study is that, notwithstanding the overall relatively low risks to financial stability, should the ECB use its monetary policy instruments to foster financial stability objectives, which in the current situation would imply a monetary tightening? Our answer is no, for the reasons discussed in Claeys and Darvas (2015). The main monetary policy instrument, the interest rate, is too broad as an instrument, and ultimately quite ineffective in dealing with the build-up of financial imbalances, as the literature demonstrates[14]. The heterogeneous financial cycles of euro-area countries also make the use of monetary policy (which cannot be differentiated by member state) an ill-suited instrument to deal with financial-sector vulnerabilities. Instead, monetary policy should focus on its primary mandate of area-wide price stability, and other policies should be deployed whenever the financial cycle deviates from the economic cycle, or when heterogeneous financial developments in the euro area require financial tightening in some but not all countries. These policies include micro-prudential supervision, macro-prudential oversight, fiscal policy and regulation of sectors that pose risks to financial stability, such as construction.

Finally, we note that the winding-down of excess liquidity is a remote prospect at the moment, because the ECB has already indicated that in the foreseeable future it aims to reinvest the maturing assets it has purchased, which will stabilise the level of excess liquidity once large-scale asset purchases end. But that reinvestment strategy will (likely) be stopped at some point when the ECB will allow its balance sheet to shrink, which will lead to a gradual reduction of excess liquidity. This might cause problems for banks that heavily rely on excess liquidity to meet the Liquidity Coverage Ratio (LCR) requirement and might raise financial stability concerns. Macroprudential authorities should require such banks to present contingency plans showing how they will address this issue.

14 See for example Bean *et al* (2010), Nelson *et al* (2015), Posen (2009) and Svensson (2014).

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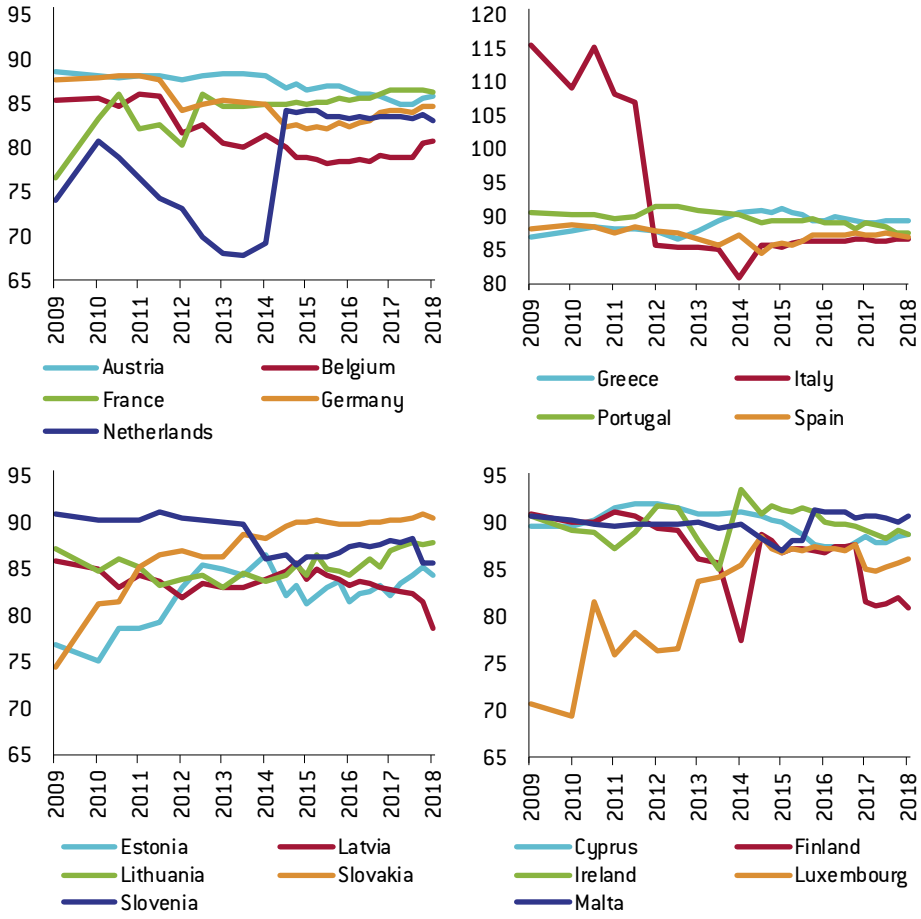
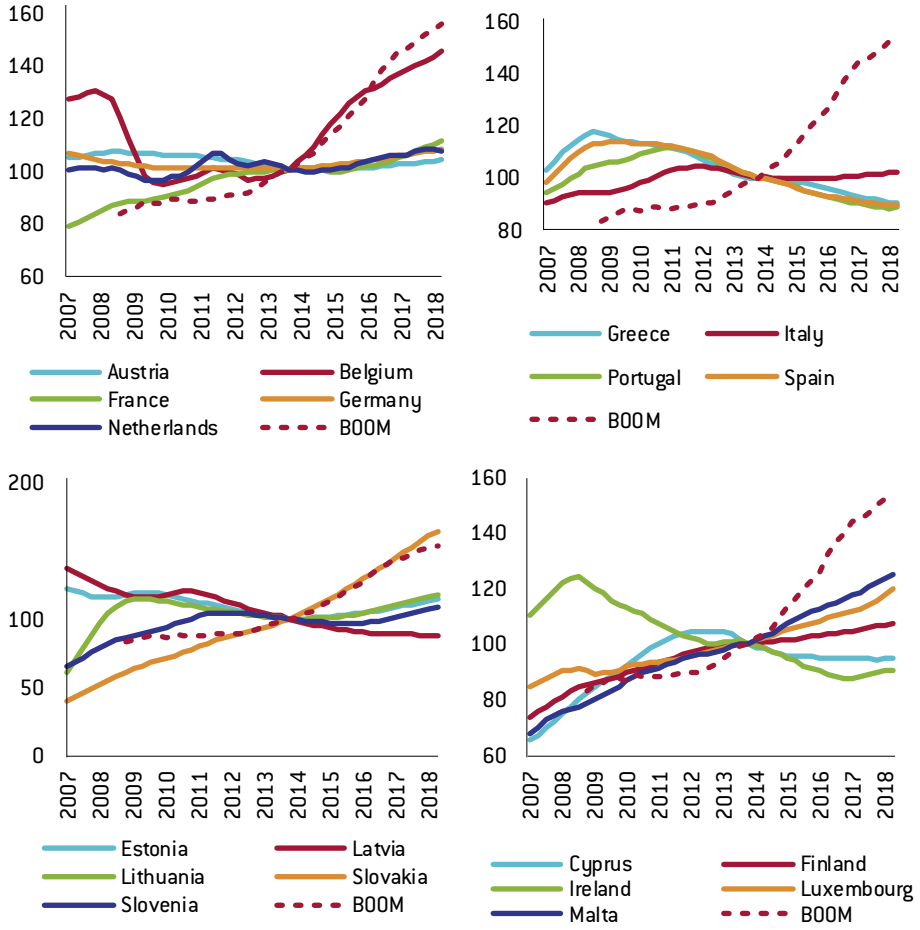
ANNEX

Figure 15: Risk-weighted exposure for credit, counterparty credit, dilution and delivery risks assets (% total risk exposure), 2008Q4-2018Q1



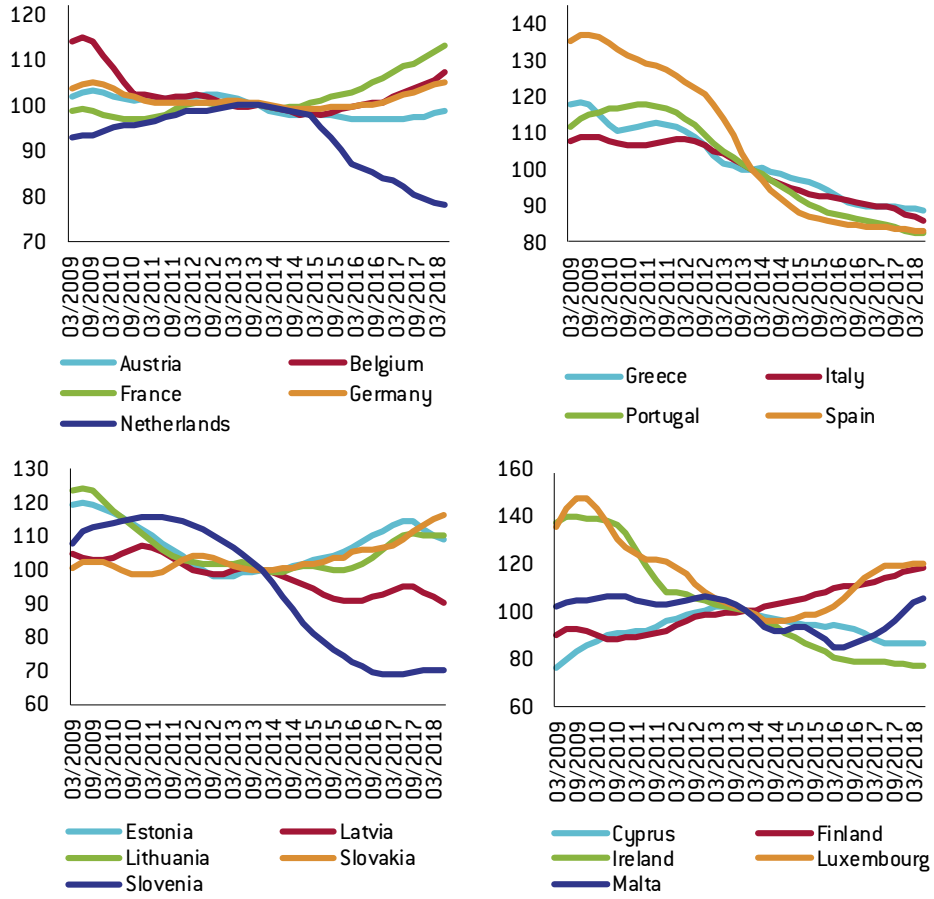
Source: Bruegel based on ECB's Statistical Data Warehouse (CBD2.Q.*.W0.11._Z._Z.A.A.I4210._Z._Z._Z._Z._Z.PC).

Figure 16: Bank lending to households at constant prices (2013Q4=100), 2009Q1-2018Q2



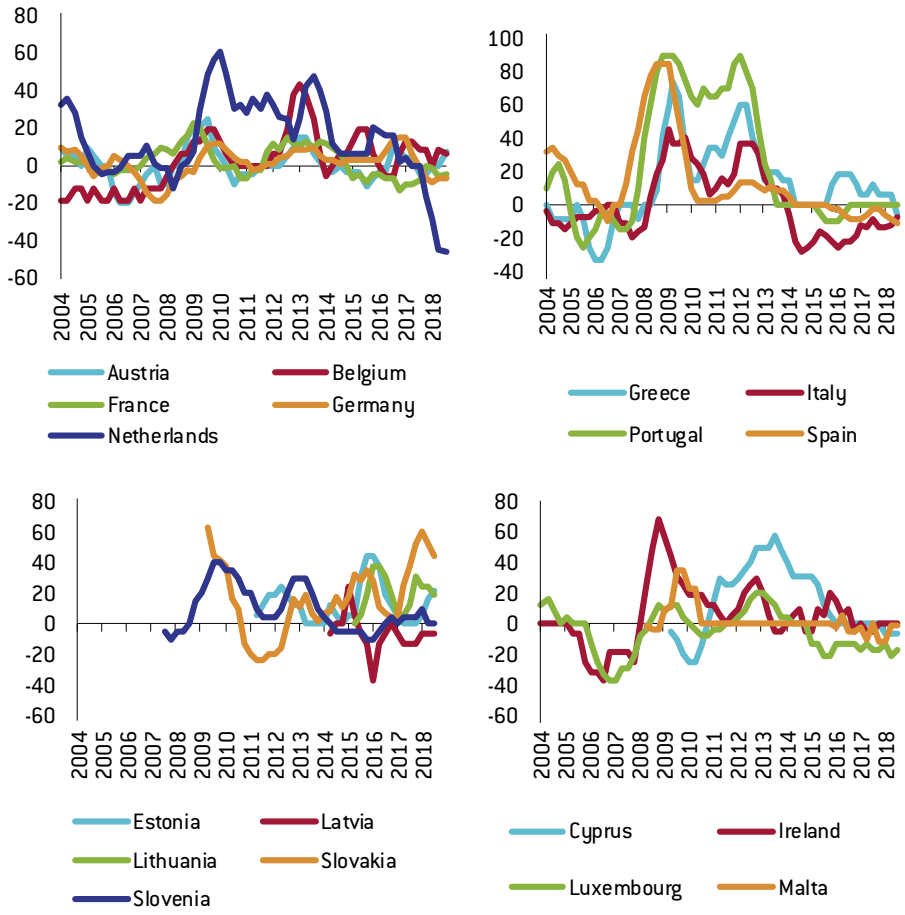
Source: Bruegel based on ECB's Statistical Data Warehouse (lending: BSI.M.*.N.A.A20.A.1.U2.2250.Z01.E and BSI.M.*.N.A.A20.A.4.U2.2250.Z01.E, HICP: ICP.M.*.N.XEF000.4.INX); Boom growth rates based on Rostagno *et al* (2016) estimates. Note: Outstanding stocks of loans have been deflated using HICP. We calculate the nominal outstanding stock of loans stocks from financial transaction (to exclude the impact of reclassifications) by cumulating transactions compared to the actual stock level in 2013Q4. Since HICP has seasonal components, we use a 4-quarter moving average of the HICP index to deflate the nominal loan stock.

Figure 17: Bank lending to non-financial corporations at constant prices (2013Q4=100), 2009Q1-2018Q2



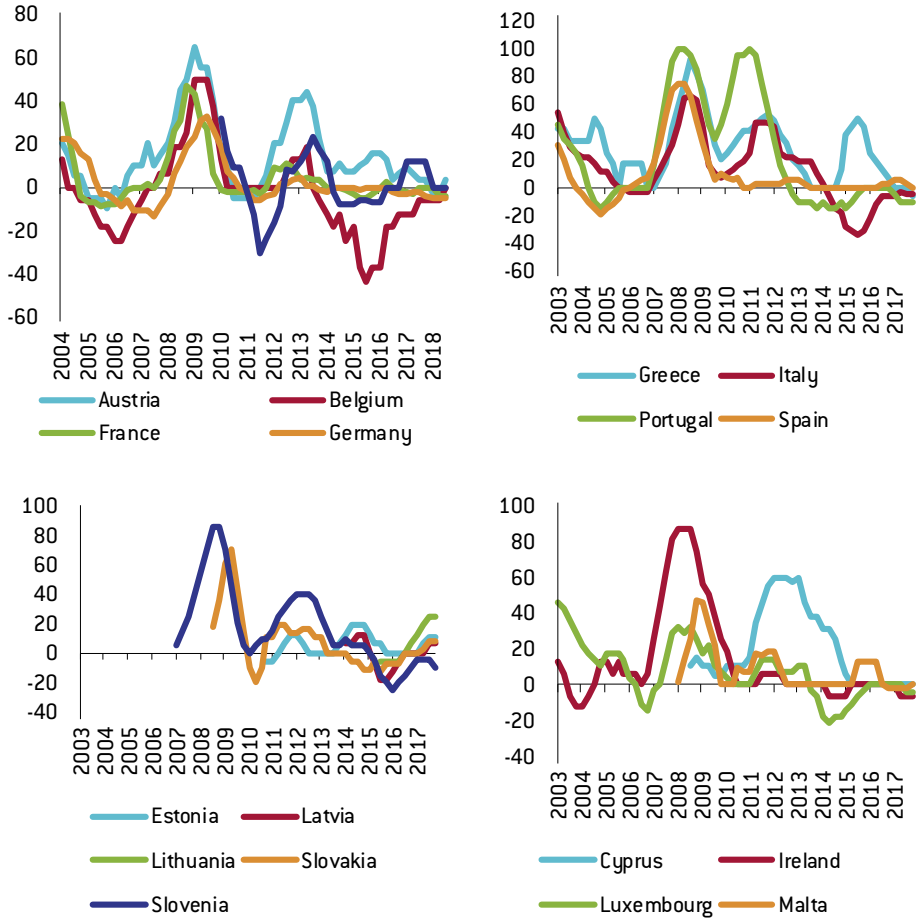
Source: Bruegel based on ECB's Statistical Data Warehouse (lending: BSI.M.*.N.A.A20.A.1.U2.2240.Z01.E and BSI.M.*.N.A.A20.A.4.U2.2240.Z01.E, HICP: ICP.M.*.N.XEF000.4.INX). Note: Outstanding stocks of loans have been deflated using HICP. We calculate the nominal outstanding stock of loans stocks from financial transaction (to exclude the impact of reclassifications) by cumulating transactions compared to the actual stock level in 2013Q4. Since HICP has seasonal components, we use a 4-quarter moving average of the HICP index to deflate the nominal loan stock.

Figure 18: Net tightening of credit standards applied to new household loans, 2004Q1-2018Q3



Source: Bruegel based on ECB's Statistical Data Warehouse (BLS.Q.*.ALL.Z.H.H.B3.ST.S.FNET and BLS.Q.*.ALL.Z.H.H.B3.ST.S.BFNET).

Figure 19: Net tightening of credit standards applied to new enterprise loans, 2004Q1-2018Q3



Source: Bruegel based on ECB's Statistical Data Warehouse (BLS.Q.*.ALL.0.E.Z.B3.ST.S.FNET and BLS.Q.*.ALL.0.E.Z.B3.ST.S.BFNET).