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SHUTTING DOWN OF THE QUANTITATIVE EASING PROGRAMME BY EUROPEAN CENTRAL BANK AS A THREAT TO THE MARKET COST OF CAPITAL AMONG LESS CREDIBLE EU MEMBER STATES

ABSTRACT

The ongoing process of shutting down the QE programme by ECB and possible reduction of its balance sheet might result in rapid corrections in the capital cost and the occurrence of the sudden stop phenomenon in the case of countries that are less credible and strongly depending on external sources of financing, thus more sensitive and less resistant towards external shocks, i.e. in countries which are the greatest beneficiaries of risk underestimation in the case of unprecedented increase in global liquidity made by major central banks after the crisis of 2008. This threat is essentially related to Poland as, apart from strong dependence from external capital which is necessary to finance the process of developmental catch-up and rolling over of the dynamically growing both public and private debt, which is additionally increased by lack of membership in the Eurozone; this is reflected in lower ratings or market cost of capital which suppress developmental possibilities of Polish economy and contribute to faster debt accumulation.

Keywords: central bank, monetary policy, quantitative easing, balance sheet, market cost of capital, economic prospects

1. INTRODUCTION

The aim of this review is to present the ECB's situation in the context of the use of quantitative easing (QE) as an unconventional tool of monetary policy and to analyse ECB monetary

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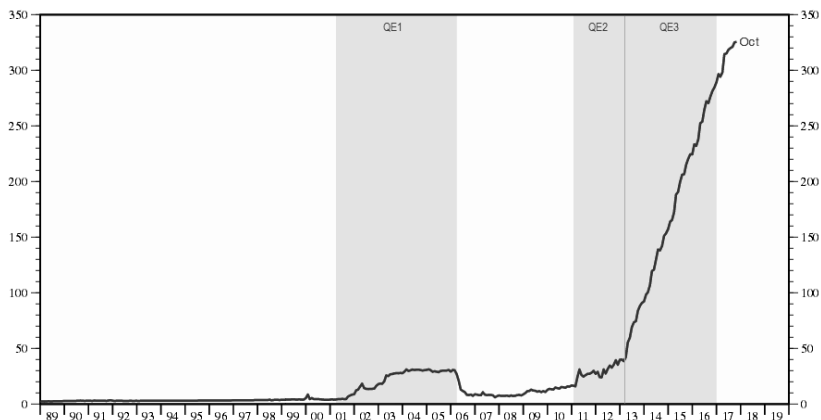
policy limitations related to the use of QE as well as threats to the free capital access and its cost, primarily in the case of the EU countries that are less credible and stronger dependent on external financing such as Poland.

Thus, statistical synthesis in the context of the increase in global liquidity as a result of QE introduction by major central banks was made; subsequently, an overview of chances and threats related to the balance sheets growth was made based on a literature survey. On the basis of that and with the use of the cause-and-effect analysis as well as inductive reasoning, an evaluation of threats related to the process of shutting down QE programmes by major central banks and reduction of their balance sheets was made.

2. QUANTITATIVE EASING

The quantitative easing programme introduced by major central banks as a response to the financial crisis of 2008 was in fact initiated a few years before that by the Japanese. The Bank of Japan conducted the very first QE programme between March 2001 and March 2006¹ (see chart 1). The QE programme (relatively non-invasive) introduced in October 2010 was not a new procedure for the Bank of Japan. However, a significantly greater scale of the purchase of assets by the Bank of Japan since April 2013 contributed to a much more aggressive state of the QE3 programme.

Chart 1. Reserve balances at Bank of Japan (trillion JPY). Increase in the effect of QE1, QE2 i QE3



* the grey area shows the QE periods

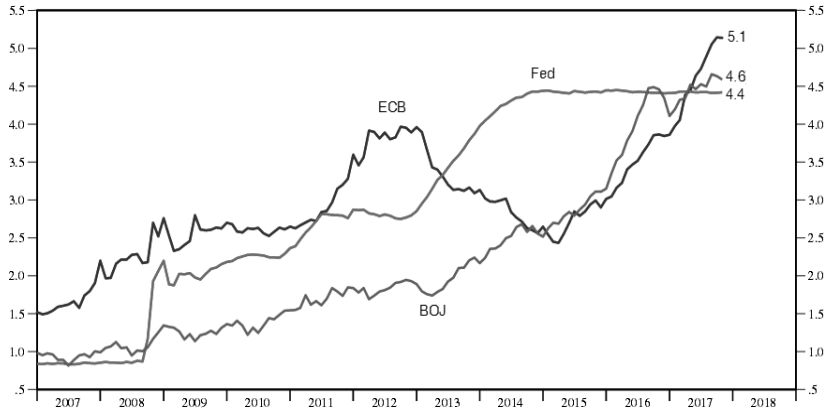
Source: Yardeni, Quintana 2017.

Thus, American Fed was not the first central bank in history to use this unconventional tool of monetary policy by the use of which it would mainly purchase treasury securities and mortgage-backed securities. But Fed was the first one that used the quantitative easing programme as a response to the crisis of 2008 and has so far been the only one that officially

¹ Overview of different results of empirical studies on efficiency of QE1 in Japan see Ugai 2006.

ended the use of the programme. The QE programme was implemented by Fed in December 2008 and lasted until October 2014. During that period, Fed assets increased five times (from USD0.9 trillion in September 2008 before the Lehman Brothers bankruptcy to USD4.5 trillion in October 2014 – see chart 2).

Chart 2. Major central banks’ total assets (trillion USD)

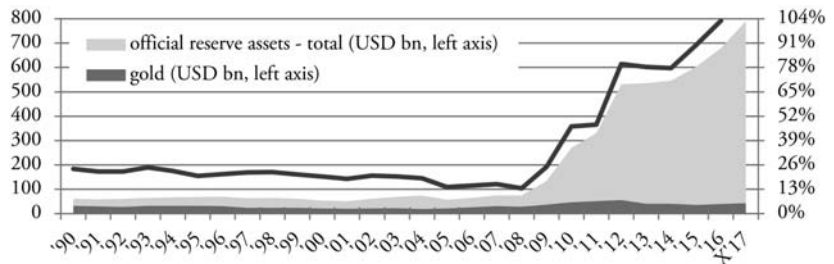


Source: Yardeni, Quintana 2017.

In March 2009 the QE programme was implemented by the Bank of England. Its current value reached GBP537.4 bn whereas 81% consists of gilt purchases (as of November 2017; BoE 2017). Swedish National Bank launched quantitative easing in February 2015. The Riksbank has soaked up 257 billion kronor (\$29 billion) in nominal debt, i.e. almost 40% of the total (as of April, 24 2017).

The case of Switzerland is essential to this overview. However, it must be stressed that the Swiss central bank is in a slightly different situation. The SNB has accumulated foreign exchange worth CHF782.8 bn at the end of October 2017 (see chart 3) due to its ongoing interventions to depress the Swiss franc and invests those created funds in the financial markets (it holds CHF132.9 bn in equities, of which the bulk is in US stocks; Durden 2017). The SNB’s foreign exchange are now over sixteen times higher than at the end of 2008, when amounted to CHF47.4 bn (SNB 2017).

Chart 3. The SNB’s official reserve assets (in USD bn and as % of GDP)



Source: own work on the basis of SNB’s and World Bank’s data.

3. ECB'S QUANTITATIVE EASING PROGRAMME

Eurosystem started a Covered Bond Purchase Program (CBPP1) in June 2009 within which it purchased covered bonds a total of EUR60 bn during the period from July 2009 to June 2010². Under the next CBPP2 it purchased covered bonds in the total value of EUR16.4 bn during the period from November 2011 to October 2012³ (although it was previously estimated that its nominal amount would be of EUR40 bn). In May 2010 the ECB launched Securities Market Purchase Program (SMP) within which private and public bonds of five stressed euro-area countries (Greece, Ireland, Italy, Portugal and Spain) were purchased. Its first round lasted till March 2011 and the second one from August 2011 till February 2012⁴. Those interventions were sterilized so as not to affect the monetary policy stance (Gibson, Hall, Tavlas 2016). In October 2014 the Eurosystem started a third Covered Bond Purchase Programme⁵ (CBPP3), in November 2014 the Asset-Backed Securities Purchase Programme⁶ (ABSPP), in June 2016 the Corporate Sector Purchase Programme⁷ (CSPP) and in March 2015 the Eurosystem started to buy public sector securities under of the much more higher value Public Sector Purchase Programme⁸ (PSPP) – ECB 2017a. The table 1 presents the Eurosystem holdings at the end of November 2017 and a present monthly net purchases.

Tab. 1. Eurosystem holdings under the Expanded Asset Purchase Programme (EUR bn)

	Holdings at the end of November 2017	Monthly net purchases (November 2017)
PSPP	1 849.0	50.7
CBPP3	239.9 ²	3.9
CSPP	128.8	7.2
ABSPP	25.4 ³	0.7
Total	2 243.1	62.6

² out of which 33,5% on the primary market

³ out of which 44,1% on the primary market

Source: ECB 2017a.

² The Eurosystem intends to hold the assets bought under this programme until maturity, so its CBPP holdings amounted to EUR6.07 bn on December 1st, 2017.

³ The Eurosystem's CBPP2 holdings amounted to EUR4.75 bn on December 1st, 2017.

⁴ The Eurosystem's SMP holdings amounted to EUR88,94 bn on December 1st, 2017

⁵ To enhance the functioning of the monetary policy transmission mechanism, supports financing conditions in the euro area, facilitates credit provision to the real economy and generates positive spillovers to other markets.

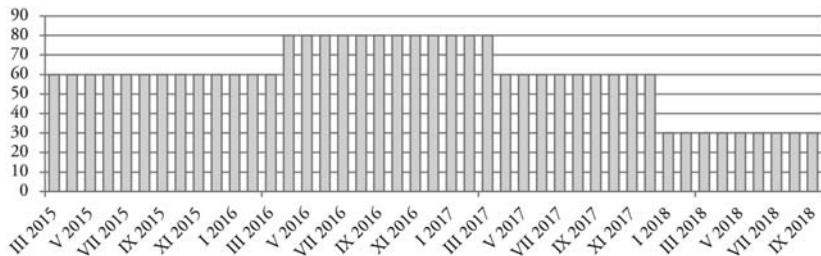
⁶ To help banks to diversify funding sources and stimulate the issuance of new securities.

⁷ Corporate sector bonds purchases are to further strengthen the pass-through of the Eurosystem's asset purchases to financing conditions of the real economy, and, in conjunction with the other non-standard monetary policy measures in place, provides further monetary policy accommodation

⁸ The Eurosystem intends to allocate 90% of the total purchases to government bonds and recognized agencies, and 10% to securities issued by international organizations and multilateral development banks

The Eurosystem holdings under the whole Expanded Asset Purchase Programme (EAPP) consisted of four above mentioned programmes reached EUR2.24 trillion at the end of November 2017. This expanded asset purchase programme was announced by the European Central Bank in March 2015. The Eurosystem has bought EUR60 bn per month of euro-area bonds from central governments, agencies and European institutions. In March 2016 ECB increased its monthly bond purchases to EUR80 bn and started to include corporate bonds. From April 2017 it reduced the assets purchases to EUR60 bn a month, and from January 2018 the ECB will continue to buy bonds through September 2018, but cut the pace of its purchases to EUR30 bn a month (see chart 4).

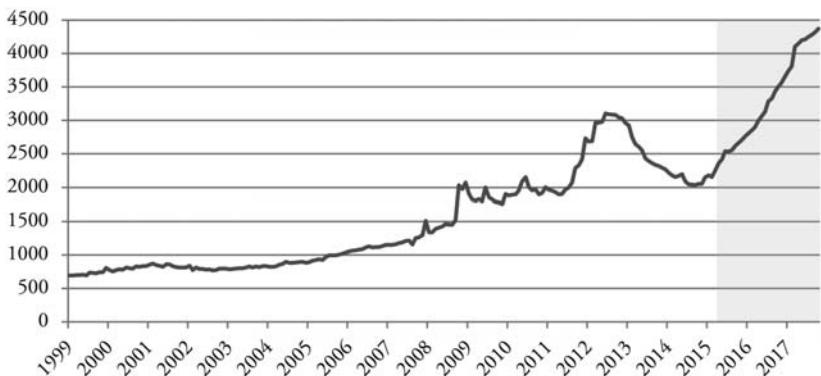
Chart 4. The ECB's monthly purchase target of EAPP on average in the period of March 2015 – September 2018 (EUR bn)



Source: own work on the basis of Eurostat's data.

As the effect of above described quantitative easing actions the ECB's assets increased twice – see chart 5, by EUR2.22 trillion (from EUR2.16 trillion at the end of February 2015 to EUR4.37 trillion at the end of October 2017).

Chart 5. ECB's assets in the years 1999–2017 (EUR bn)



Source: Own work on the basis of Eurostat's data.

4. UNCERTAIN BOUNDARIES OF THE ECB MONETARY POLICY

Apart from unprecedented enormous scale of QE as a controversial tool of monetary policy, lack of experience in its use and little knowledge on its effects, the risk additionally increases uncertainty within the boundaries of the ECB monetary policy in subsequent periods. Aside

from the second decision on decreasing the scale of asset purchase by ECB, there is no unequivocal information provided by ECB on its subsequent planned actions in terms of the extent of balance sheet of the Eurozone's central bank. The question is, is it possible to extend the QE programme after September 2018? If yes, what is the ECB's decision based on? Is ECB planning to reduce the balance sheet? If yes, would that take place immediately after the QE termination? If not, which factors will determine the introduction of balance sheet reduction process (Smaghi 2017)? Will the reduction come back to the level of the one before the crisis of 2008? If not, which level will be established? Also, for how long does the ECB plan to divide the activities decreasing its balance sheet?

The importance of this information for the market is increased by clear information policy of Fed in this regard. When shutting down the QE programme in October 2014 (when its balance sheet reached USD4.48 trillion), Fed informed about maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction (Fed 2014); thus, it informed about sustaining the previous level of long-term assets in order to help maintain accommodative financial conditions. In December 2016, Fed additionally stated that it will not implement the process of balance sheet reduction until normalization of the level of the federal funds rate is well under way (Fed 2016).

The importance of having knowledge on the future character of monetary policy is confirmed by the studies of Gibson, Hall, Tavlas 2016, which demonstrated that clear statement of the ECB president has a much greater impact on financial markets than the SMP programme lasting several months. The statement by Mario Draghi on 26 July 2012 that the ECB would "do whatever it takes" to preserve the euro, appears to have had significantly larger effect than the SMP in reducing spreads on 10-year sovereign bonds. This result could be a consequence of the open-ended nature of his statement, in contrast to the SMP which had set-down clear limits from the outset and was accompanied by conflicting statements from some Eurosystem officials.

5. LIMITS IN ECB'S QE PROGRAMME

It must be noted that, in the case of ECB, the information on future plans and their different scenarios are essentially important as, in comparison with other central banks (for example Fed or BoJ), the freedom of the ECB monetary policy in the scope of QE is greatly limited by the Maastricht Treaty and limits imposed by ECB itself. This additionally increases risk related to uncertainty in terms of QE termination as well as in terms of balance sheet reduction but also, more importantly, it arouses concerns over effectiveness of the ECB monetary policy in the situation of subsequent shocks.

Article 123, paragraph 1 of TFEU prohibits ECB and national central banks from issuing loans and credits to national and EU-based public entities as well as direct purchase of debt securities from these entities. In accordance with the above, this article does not prohibit from purchasing securities on the secondary market, which was confirmed by the European Court of Justice on June 16th, 2015 (Judgement of the Court 2015) and ECB points out that it should be treated as supporting stability of the financial system in the Eurozone, which is in accordance with article 127 paragraph 5 of TFEU⁹; however, these activities are regarded as

⁹ See i.a. ECB 2015.

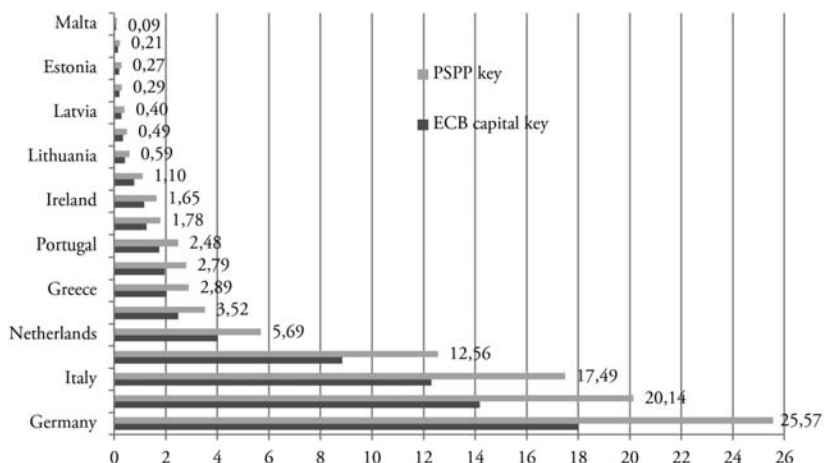
controversial and are questioned in terms of subsequent growth of already high public debt in the majority of EU member states (general government debt at the end of 2016 was calculated at 83.2% GDP on average, where in the case of 16 EU member states it exceeded 60% of GDP; Eurostat 2017), which limits development opportunities of European economies and the ability of governments to influence economic processes.

As previously indicated, treasury bonds were also purchased by Fed, BoE, BoJ and Riksbank; ECB alone purchased them subsequently earlier: between May and July 2010, ECB purchased treasury bonds of Greece, Ireland and Portugal, and between August and December 2011, ECB purchased treasury bonds of Spain and Italy. (Gros, Alcidi, Giovanni 2012).

On 22 January 2015, the Governing Council of the ECB expanded the asset purchases on the secondary markets under public sector asset purchase programme (PSPP) but set two limits. The first one indicates that purchases of eligible marketable debt securities under the PSPP are subject to an initial issue share limit of 25% per international securities identification number (ISIN; Decision ECB 2015/774). On 3 September 2015 it increased this limit to 33% per ISIN (Decision ECB 2015/2101). The second limit under the PSPP is an aggregate limit of 33% of an issuer's outstanding securities (Decision ECB 2015/774). Both of them apply to holdings in all of the portfolios of the Eurosystem central banks.

Under the PSPP the national central banks and the ECB may purchase marketable debt securities on the secondary markets in proportions reflecting their respective shares in the ECB's capital key. Due to the fact that the capital of the ECB comes from the national central banks of all EU member states¹⁰, also from non-euro area national central banks (which pay up 3.75% of their total share in the subscribed capital to contribute to the operational costs incurred by the ECB), the PSPP programme includes the purchase of treasury bonds not only from the Eurozone member states, the PSPP key is higher from the ECB capital key – see chart 6.

Chart 6. ECB capital key and PSPP key (in %, October 2017)



Source: own work on the basis of ECB 2017b.

¹⁰ The NCBs' shares in this capital reflects the respective country's share in the total population and gross domestic product of the EU (equal weighting) – ECB 2017b.

PSPP key is set proportionally to the ECB capital key but only in the relation to the Eurozone member states. Due to the fact that German Bundesbank is the major ECB shareholder (its share in the ECB subscribed capital amounts to 17.9973%), thus German governments bonds (bunds) constitute the largest part of debt securities acquired by ECB under the PSPP (it amounts to 25.57% of total PSPP purchases).

It must be noted that after 3 years of the PSPP implementation, Eurosystem got significantly closer to set limits (see table 2), which already limits the effectiveness of ECB's monetary policy and also questions the effectiveness of possible future ECB's actions in terms of subsequent shock and the revival of QE. In order to regain flexibility and effectiveness,

Tab. 2. The degree of exhaustion in terms of purchase limits for general government debt securities under the PSPP – at the end-June 2017

	general government debt securities outstanding EUR bn, BIS, at end-June 2017	Cumulative net purchases (ECB)		
		in EUR bn (at end-October 2017)	as a % of GG debt securities outstanding (at end-June 2017)	Remaining Weighted Average Maturity in years (at end-October 2017)
Germany	1 613.2	437.1	27.1%	6.74
France	1 903.3	356.1	18.7%	7.79
Italy	1 925.2	309.7	16.1%	8.24
Spain	970.9	218.3	22.5%	8.42
Netherlands	334.7	97.9	29.2%	7.53
Belgium	397.8	62.0	15.6%	10.16
Austria	256.7	49.2	19.2%	9.14
Portugal	160.4	30.1	18.7%	8.48
Finland	106.9	27.9	26.1%	7.47
Ireland	134.1	23.4	17.5%	9.35
Slovakia	36.8	10.5	28.4%	8.37
Slovenia	29.8	6.4	21.5%	10.25
Lithuania	14.9	2.8	18.6%	6.88
Luxembourg	7.9	2.3	28.9%	5.66
Latvia	7.9	1.7	21.6%	7.74
Malta	5.3	1.0	19.6%	10.76
Cyprus	7.0	0.2	3.1%	4.36
Estonia	0.0	0.1	-*	0.70
	7 912.7	1 636.6	20.7%	
Supranationals		197.7		7.60
Total		1 834.3		7.80

* due to excessive rounding of data by BIS the relation can not be set

Source: own work on the basis of ECB 2017a and BIS 2017.

ECB must reduce the value of assets which suggests relatively fast process of reducing ECB's balance sheet with the full spectrum of negative consequences reflected on the freedom of accessing market financing in Europe and also on its cost level (especially in the context of economies such as Poland which have the highest debt, are less credible and/or strongly depend on external financing). The awareness of that already increases uncertainty and risk on European debt markets, which makes it harder for European economy to enter the path of economic growth; it also poses a threat of another financial crisis as it increases the probability of a sudden stop in the case of less credible countries with the highest debt.

At the end-October 2017 the Eurosystem holdings of general government debt securities amount to EUR1.6 trillion, i.e. 20.7% of overall general government debt securities outstanding at the end-June 2017. In its nominal aspect, Eurosystem owns the majority of German (EUR437 bn), French (EUR356 bn), Italian (EUR310 bn), Spanish (EUR218 bn) and Dutch (EUR98 bn) general government debt securities, which account for 86.7% of total Eurosystem purchases under PSPP (see table 2). Due to a different level of the PSPP key, different level of public debt in EU member states and its structure, different level of emission of general government debt securities of dissimilar maturity, PSPP limits have been exhausted at different levels. As a result, the following countries are the closest to having exhausted the PSPP limit: Netherlands (29.2% at end-June 2017), Luxembourg (28.9%), Slovakia (28.4%), Germany (27.1%) and Finland (26.1%), i.e. except Slovakia there are the most credible countries.

Another limitation of the programme of purchasing assets by ECB in the context of currently heavily exhausted limits in the case of some countries (Ireland, Finland, Portugal and Germany; Bankier.pl 2017) can be seen in the real issue of limited availability of treasury bonds with extended maturity which forces ECB to purchase bonds with increasingly shorter maturity¹¹. This means successive decrease in the quality of assets owned by ECB in the subsequent months – the share of government bonds belonging to Eurozone economies with the highest debt and thus less credible will increase and the share of government bonds belonging to more stable economies will decrease. As pointed out in the analyses made by Bloomberg, a shortage of available bonds in countries such as Ireland, Finland, Portugal and Germany has seen this shortfall made up with an increasing share of French and Italian bonds (Ainger, Spratt 2017). It will most probably translate to the estimation of investment risk in the entire Eurozone, thus in other EU member states as well, including Poland. It will also translate to the trust towards monetary policy of ECB, meaning trust in effectiveness of stabilizing the situation on the European market. What is important, it is related not only to current activities of ECB but also the future ones. If the QE shut down by ECB will not be accompanied by significant reduction of ECB's balance sheet in the subsequent periods (which is especially painful for those economies that are less credible and strongly depend on external financing), then ECB, with its current rules and limits within PSPP (in contrast to other major central banks that do not have such limitations) as well as high and fully exhausted limits of the most credible countries, will not be able to implement a programme similar to present QE in the future in the case of another crisis or other tensions.

¹¹ It must be noted that debt securities purchased under PSPP should have a minimum remaining maturity of two years and a maximum remaining maturity of 30 years at the time of their purchase (Decision ECB 2015/774).

6. THE ECB BALANCE SHEET REDUCTION'S NEED

It must be noted that, in contrast to other central banks which will not shock by introducing radical cuts of interest rates in case of another recession (even to a negative level) and/or will not shock by introducing implementation of another QE programme which will increase their balance sheet, ECB with current legal solutions will not have a possibility of increasing its balance sheet unless it introduces its advanced consolidation (Smaghi 2017). What is more, possible further loosening of PSPP rules which enables significant increase in the ECB's balance sheet value over the current level, will decrease the programme's effectiveness in lowering the investment premium risk, especially in countries that need this effect the most. There is a solution of further interest reduction (below zero), but there are already visible threats connected with long-lasting low interest rates that can affect the financial system and weaken the mechanism of transmitting ECB monetary policy which might level possible advantages of such reduction. It causes paradoxical concerns whether ECB will not desire to regain some room for maneuvers by shutting down the current QE faster and increasing interest rates faster than the market predicts. This would be a drastically different course of action from the other central banks and it would definitely cause great uncertainty in the financial system along with unpredictable repercussions for the EU's economy. It must be noted that German bond scarcity in the situation of over 25% German PSPP key may also provide incentive for ECB taper.

7. THREATS CONNECTED TO QE TAPERING AND QUANTITATIVE TIGHTENING (QT) SPECIFICALLY FOR WEAKER ECONOMIES

It must be pointed out that as a result of the statement made by the Federal Reserve Chairman Ben Bernanke on 22 May 2013 before US Congress that the Fed could slow down its asset purchase program in the next few months, and his subsequent announcement from June 19th, 2013 on plans of limiting the rate of bond purchase in the later part of the year as well as ending the purchase programme in the middle of 2014, if the economy continues to improve at a rate corresponding to current expectations, global markets reacted with a decrease. The decrease affected not only shares, but also bonds, currencies, raw materials (including gold). It was also visible in Poland. WIG20 index lost 4.79% on the next day. Polish zloty (PLN) weakened as well (PAP 2013). As it was expected, the slowdown of the rate at which global liquidity increases and, subsequently, complete stop of the process, will result in the decreased prices of assets and increased interest rates in the USA which will increase attractiveness of investments made in USD, especially at a disadvantage of currencies with high real interest rate (like Polish zloty). These threats were pointed out by, among others, analysts of IMF, who indicated that Fed's actions and temporary uncertainty about the exit from monetary policy stimulus in the United States might lead to a lasting turning away of the capital from emerging economies and to incremental corrections in estimation of assets, currencies and cost of capital. They pointed out that emerging market economies have generally been hit hardest, as recent increases in advanced economy interest rates and asset price volatility, combined with weaker domestic activity have led to some capital outflows, equity price declines, rising local yields, and currency depreciation. Thus, it should not come as

a surprise that, since May and June of 2013, countries of the southern part of the Eurozone had to pay significantly more for debt financing and the outflow of capital was visible in the context of emerging economies (IMF 2013).

The lack of information on the ECB plan of QE tapering and possible balance sheet reduction increases investment risk. Markets do not have a clear understanding of the monetary framework that will prevail once QE is phased out, in particular how the bank would react to a resurgence of financial tensions, a new economic slowdown or recession (Smaghi 2017). This uncertainty is increased by the announcement of Fed's balance sheet reduction and votes for BoE's balance sheet reduction (McCafferty 2017), as well as threats that can be imposed by both of the alternatives for balance sheet reduction. The ECB can reduce its balance sheet by selling purchased assets or by not reinvesting maturing securities. The first option, a more aggressive one, would cause rapid increase of market interest rates, especially in more indebted economies (Hankin 2017). Thus, it has to be argued that the balance sheet reduction should be passive, i.e. the central bank should choose not to reinvest maturing securities. Additionally, as pointed out by Bernanke, it should be based on a comprehensive, market-wise and consequently implemented action plan of the central bank (Bernanke 2017), which is an argument for a clear frame of monetary policy and withholding of the reduction process until interest rates are on a level that allows the central bank to control economic processes. However, in the case of ECB, this mean the extension of the far limited effectiveness of its monetary policy or loosening of ECB's rules in terms of QE, which will enable continuation of greatly extended fiscal policies of many EU member states; these will result in both cases in the increased premium risk and lowered investment tendencies which greatly limit development opportunities of EU member states that are less credible and greatly depend on external financing.

8. PRO AND CON FOR A LARGE CENTRAL BANK'S BALANCE SHEET

It must be added that, according to Bernanke, the balance should not be reduced at all (Bernanke 2016). He argues the Fed should keep a large balance sheet to improve the ability of the Fed to provide assets in a crisis. A large Fed balance sheet could be a tool for enhancing financial stability. Greenwood, Hanson, Stein 2016 documented, that there is a strong demand from the private sector for safe, liquid, short-term securities. And having a large balance sheet central bank could meet this demand. But it must be noted that the exceptionally low cost of very short-term borrowing incentivizes risky behavior. That's why the central bank should provide truly safe short-term assets in the form of bank reserves and especially through an expanded reverse repo program that would be open to a wide range of counterparties. Duffie, Krishnamurthy 2016 argue that a larger balance sheet that incorporates a robust reverse repo program could improve the passthrough efficiencies of the central bank's monetary policy. The central bank could better ensure that its interest rate decisions are transmitted to financial markets, by maintaining a sizable reverse repo program and improvements in repo market infrastructure for nonbank institutions. A third possible motivation for the Fed to keep a large balance sheet in the long run relates to its role as a lender of last resort during financial crises (Bernanke 2016). Central bank could inject missing liquidity into the system. But financial institutions may be reluctant to borrow in the crisis (stigma). Bernanke 2016 points out, however, that stigma is much weaker in Europe than in the USA which might

be related to the fact that European institutions routinely engage with the central bank in normal times (e.g. before the 2008 crisis) – make substantial deposits at the ECB as well as large borrowings.

On the other hand, it must be noted that central banks, by providing more backstop liquidity to the financial system, may reduce the private sector's incentives to manage its own liquidity effectively (the moral hazard problem). Besides an easy access in unlimited amount to reverse repo transactions with central bank could itself be destabilizing in a financial panic. In this view, in a period of financial stress, investors might start getting rid of private short-term assets on a large scale and start selecting repo transactions with the central bank, causing fire sales. But as Bernanke 2016 points out, in order to discourage investors from performing the above, the central bank must keep the reverse repo interest rate low even as private rates rise during a panic. As Bernanke indicates, even the concept of a larger balance sheet which enhances financial stability and improves the central bank's ability to serve as a lender of last resort will stabilize actions of investors. According to Sims 2016, higher risk of attack on the central bank's independence is against a large balance sheet, because large assets generate the risk of higher financial losses of the central bank, and thus higher risk related to fiscal situation in the state budget. One must agree with J. Stein's view that the issue is found not in the overall quantity, but the asset structure of the central bank. Greenwood, Hanson, Stein 2016 point out that sustaining assets that are permanently high, but also safe and of limited duration, doesn't have to imply excessive fiscal risk.

There are certain concerns expressed, mainly that a large balance sheet approach to monetary policy could put upward pressure on government securities yields, could lead to banks hoarding reserves in a crisis, and could lead to a reduction in the efficiency in interbank markets with an accompanying reduction in the efficiency of the payment system (Nelson 2017b). The Fed will have to continue to hold a massive balance sheet and become more directly involved in the financial system than it has ever been in order to prevent the increase of market interest rates. Fed will have to meet the demand worth of a few trillions of dollars for liquid and safe assets. In short, before the crisis, if a bank wanted to hold a liquid asset, it bought a Treasury bill. In the Fed's new world, the Fed would buy the Treasury bill and the bank would have a deposit at the Fed. Apart from that, capital regulations, especially a leverage ratio requirement that banks hold a large amount of capital against riskless assets such as Treasury securities, have made it unprofitable for banks and their affiliated broker dealers, to intermediate in the repo market. This further increases the mounting threats to its operating and monetary policy independence. It also increases concerns over the slowdown of development of other segments of the financial market (Nelson 2017a). It holds also for the European financial markets with strong position of the banking sector, high borrowing needs of governments with different credibility that limits development of other segments of the financial market and increases cost of capital.

Nelson 2017a points out also that, with a perspective of the globally increased interest rates, central banks with massive balance sheet will have to make correspondingly enormous interest payments to commercial banks, with the largest payments naturally going to the largest banks. If both market rates and the central bank's interest rate for excess reserves return to a more normal level of for example 3 percent, the central bank would pay banks additionally EUR30 billion a year in interest for every additional EUR1 trillion in ECB's reserves. And the central banks will not make up for the expense on the interest it paid through the interest it

earned on its holdings of governments securities, like they have made in recent years during a time of falling interest rates. Because in the situation of rising interest rates the term interest rates the central bank will earn are lower than expected average short-term rates it will pay. In order to reduce the scale of this phenomenon, the central bank would have to reduce its balance sheet relatively fast (as well as its excess reserves) and it would also have to pay a substantially below-market rate so banks choose to hold much smaller levels of reserves, in order for the central bank to return to its traditional more passive role in financial markets. Thus, the central bank should choose to gradually sell its enormous holdings of government securities rather than simply let them run off. It can be debated whether banks used to functioning in a new way will want to come back to old solutions from before the crisis of 2008 and, even if they will, the question remains how significantly it will increase the cost of financial services and limit the free access to bank loans.

9. CONCLUSIONS

The QE programme which has been conducted for almost a decade by major central banks worldwide has granted access to easy and cost-efficient financing, contributed to the increased fiscal expansion and debt dynamics (not only public debt) in many EU countries – these limit development opportunities for European economies and also limit the possibility of governments to influence economic processes. The programme has been demotivating governments for many years in the context of taking action towards ensuring stability and economic credibility or increasing stability of the banking sector, as well as it decreases the vigilance of economic entities. It causes underestimation of the market cost of capital in Europe and risks which will be a result of ECB's withdrawal from the QE programme; signs of this could have already been observed in the increased market cost of capital after the decision of decreasing the value of purchased assets since April 2017. Similar changes might be expected with the beginning of 2018 when the purchase will be cut in half, that is to EUR30 bn and, subsequently, when the programme will be entirely shut down and also when ECB will proceed with its balance sheet reduction. It is related especially to countries with weaker economies, strongly depending on external financing; in the case of these countries, the corrections are much more severe due to the phenomenon of risk underestimation during calm periods and due to the increased optimism on financial markets.

It must be noted that none of the central banks that implemented QE have already introduced balance sheet reduction which means that the phenomenon of increased global liquidity is still present. And although there is a dominant view that the size of central bank's balance sheet rather than the flow or impulse (flow acceleration or flow deceleration) impacts markets and the economy, the view expressed by Norelli 2017 that, the flow is the critical factor, both for asset prices and for the impact on the economy¹² seems to be justified. However, that neutrality on a domestic level is overwhelmed by QE expansion still going on in other countries. It confirms the concerns over the increased capital cost which will happen in the situation of the QE shutdown by central banks, even without balance sheet reduction.

¹² QE increases the *ratio* of cash to financial assets worldwide, and that ratio reflects the relative abundance or scarcity of cash available to purchase each unit of assets QE's influence on that ratio drives up the price of financial assets, all else equal (Norelli 2017).

It must be noted that the ECB's situation is very specific. It is not about diverse credibility, capital demand, creditworthiness of respective Eurozone member states, but it is primarily about different monetary frame of ECB. The issue can be found in both the Maastricht Treaty which greatly limits ECB's freedom in terms of QE, but also in limits imposed by ECB itself, as well as lack of clear information policy on the ECB's side which greatly increase investment risk and concerns over the effectiveness of the ECB monetary policy in case of subsequent shocks. It must be added that extensively exhausted limits and observed loosening of the rules of assets purchase by ECB seems to limit QE's effectiveness in decreasing the risk investment premium, especially in countries that need this effect the most, i.e. less credible and with strong dependency on external financing, thus more sensitive and less resistant to external shocks – such as Poland, as it is also not a member of the Eurozone and has floating exchange rate (more in Redo 2017c). The above prevents effective steering of market expectations and makes it challenging to increase economic optimism in Europe.

It is worth adding at the end that the NBP's share in the ECB capital amounts to 5.123%, which means that if Poland was the 20th member of the Eurozone, then NBP's PSPP key would amount to 6.784%; thus, NBP within the PSPP programme would have been purchasing PLN17–23¹³ bn worth of Polish treasury bonds on a monthly basis since March 2015. This indicates that since June 2016, i.e. since a year and a half ago, NBP would own 1/3 of Polish treasury bonds amounting to around PLN276 bn (among PLN605 bn of market bonds emitted on the national market and PLN223 bn of treasury bonds emitted on foreign markets; as calculated in September 2017). This would have been reducing the yield of Polish treasury bonds for almost 3 years – and this yield has been ranked as one of the highest among all EU member states (more in Redo 2017b, Redo 2016, Redo 2017a); it would also reduce the market cost of capital resulting in lower interest rates of subsequent emissions of treasury bonds as well as the public debt servicing costs, interest rates of loans for entrepreneurs and households in Poland. This would lead to a slower increase of debt among Polish economic entities, higher creditworthiness, increased consumption and investment opportunities, thus an improvement of economic perspectives.

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¹³ i.e. around PLN17 bn monthly between March 2015 and March 2016 as well as PLN23 bn monthly between April 2016 and March 2017 (own calculations on the basis of MF 2017 and NBP 2017).

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