

The Effects and Side Effects of the European Central Bank' Quantitative Easing Monetary Policy.

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Introduction

The euro-area entered a recession in the first quarter of 2008, and quarterly growth rates collapsed in the first quarter of 2009, when the financial crisis hit Europe full-force. The sovereign crisis occurred in Portugal, Ireland and Greece (Greek sovereign crisis occurred in succession in 2010, 2012 and 2015) off and on.

The financial crisis was compounded of the sovereign debt crisis and the bank solvency crisis. A hike of government bonds yields induced credit market interest rates to increase, thus contracted credit markets. Banks which hold government bonds on the balance sheet were heavily damaged by a decrease of asset values. Moreover, since investors shifted funds from the nation to others, an outflow of funds forced banks to face liquidity crisis. After the financial calmed down, the consumer price indices have remained low in a reflection of weak demand in the euro-area.

The ECB has implemented Non-Standard Monetary Policy measures, in order to prevent sovereign crisis and liquidity crisis, to sustain price stability and the financial system. The Non-Standard monetary policy was conducted in the form of Quantitative Easing policy. The main purpose of this article is to evaluate the effects and the side effects of the Quantitative Easing monetary policy in the euro-area after the financial crisis.

Section I presents the methods and practice of the ECB's Quantitative Easing (QE) monetary policy.

Section II presents the impacts of the QE on the monetary side and the real economic side. The ECB announced that its measures of the QE can help to enhance the transmission mechanism, support financial condition, and facilitate credit provision to the real economy. The repeated phrase of the ECB's announcement is functioning of the transmission mechanism. Although the influences on the monetary aspects of the transmission mechanism differ in the euro-area because of different financial structures, macro-economic data of the euro-area is analyzed to give an empirical evaluation on the real economy as a whole.

Section III address the side effects of the QE. The Implicit aim of the ECB's monetary policy was to rescue nations which are struggling with heavy sovereign debt and to rescue the commercial banks with non-performing assets. It was necessary for the ECB to prevent contagion of bankruptcy which causes systemic risks of financial markets. However, the side effects also should be analyzed to evaluate the QE as a whole.

Section 1. The Practice of the ECB's Quantitative Easing monetary policy

1.1. The methods of the QE

In the depths of the financial crisis which hit peripheral nations, the ECB implemented the monetary policies reforms intermittently. The methods were compounded with open market operation reforms, assets purchase programme, and the negative interest rate policy. The methods of the Eurosystem's instruments are explained in more details on the ECB website¹. The essence of the measures is described as below.

Open market operation reforms

In October 2008, the Governing Council of the ECB decided to increase the frequency and size of its longer-term refinancing operations (with a maturity of up to six months) and to conduct all liquidity-providing operations through a fixed rate tender procedure with full allotment².

In December 2011, the ECB decided to implement additional non-standard monetary policy measures. The agreed package of measures included two longer-term refinancing operations (LTROs) with a maturity of three years and the option of early repayment. The first operation was conducted in December 2011, while the second will be conducted in February 2012 in the midst of severe tensions in financial markets of

¹ ECB, monetary policy, instruments.[<https://www.ecb.europa.eu/mopo/implement/omt/html/cspp-qa.en.html>]

² ECB, Monthly Bulletin, June 2009,p.9.

peripheral nations. Through these operations, carried out as fixed rate tender procedures with full allotment, the Eurosystem was in particular ensuring that banks continue to have access to stable funding with longer maturities³.

As announced on 2 August 2012, on 6th September 2012, the ECB has taken decisions on a number of technical features regarding the Eurosystem's outright transactions in secondary sovereign bond markets that aim at safeguarding an appropriate monetary policy transmission and the singleness of the monetary policy. This operation was known as Outright Monetary Transactions (OMTs). The ECB announced to purchase sovereign bonds with a maturity of a year to three years unlimitedly under the appropriate conditions of the sovereign nations⁴.

The targeted longer-term refinancing operations (TLTROs) are Eurosystem operations that provide financing to credit institutions for periods of up to four years. They offer long-term funding at attractive conditions to banks in order to further ease private sector credit conditions and stimulate bank lending to the real economy. A first series of TLTROs was announced on 5 June 2014 and a second series (TLTRO II) on 10 March 2016⁵.

Asset Purchase Programmes

On the 10th May 2010, the ECB's Governing Council decided on several measures to address the severe tensions in certain market segments which are hampering the monetary policy transmission mechanism. The measures (Securities Markets Programme) were interventions in the euro area public and private debt securities markets to ensure depth and liquidity in those market segments which was dysfunctional⁶.

On October 2014, the Eurosystem started to buy covered bonds under a third covered bond purchase programme (CBPP3). The measure helps to enhance the functioning of the monetary policy transmission mechanism. Then the asset-backed securities purchase programme (ABSPP) started on 21 November 2014. The ABSPP was supposed to help banks to diversify funding sources and stimulates the issuance of new securities.

The expanded asset purchase programme (APP), as announced in January 2015, added

³ ECB, Monthly Bulletin January 2012, Box 4, p.30.

⁴ ECB, Press Release, Technical features of Outright Monetary Transactions, 6 September 2012.

⁵ ECB, Press Release, ECB announces monetary policy measures to enhance the functioning of the monetary policy transmission mechanism, 5-June-2014.

⁶ ECB, Press Release, ECB decides on measures to address severe tensions in financial markets, 10 May 2010.

the purchase programme for public sector securities to the existing private sector asset purchase programmes (CBPP3 and ABSPP) announced in September 2014, to address the risks of a too prolonged period of low inflation⁷. Thus, the APP comprises the following purchase programmes; third covered bond purchase programme (CBPP3), asset-backed securities purchase programme (ABSPP) and public-sector purchase programme (PSPP).

On 9 March 2015, the Eurosystem started to buy public sector securities under the public-sector purchase programme (PSPP). The securities covered by the PSPP include (a) nominal and inflation-linked central government bonds, (b) bonds issued by recognized agencies, regional and local governments, international organizations and multilateral development banks located in the euro area. 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 (from March 2015 until March 2016 these figures were 88% and 12% respectively).

The ECB's negative interest rate

On the 12th June 2014, the ECB started a negative interest rate policy. Since the euro area inflation was expected to remain considerably below 2% for a prolonged period, the ECB's Governing Council judged that it needs to lower interest rates. Since the deposit rate was already at 0% and the refinancing rate at 0.25%, a cut in the refinancing rate to 0.15 % meant the deposit rate was lowered to minus 0.10 % to maintain this corridor. The cut was part of a combination of measures designed to ensure price stability over the medium term. The ECB intended to encourage banks to increase lending by charging fee on the banks' balance on the ECB's deposit balance. The rate of deposit facility was lowered successively from minus 0.1% in June 2014 to minus 0.4% in March 2016.⁸

1.2. The Practice of the QE

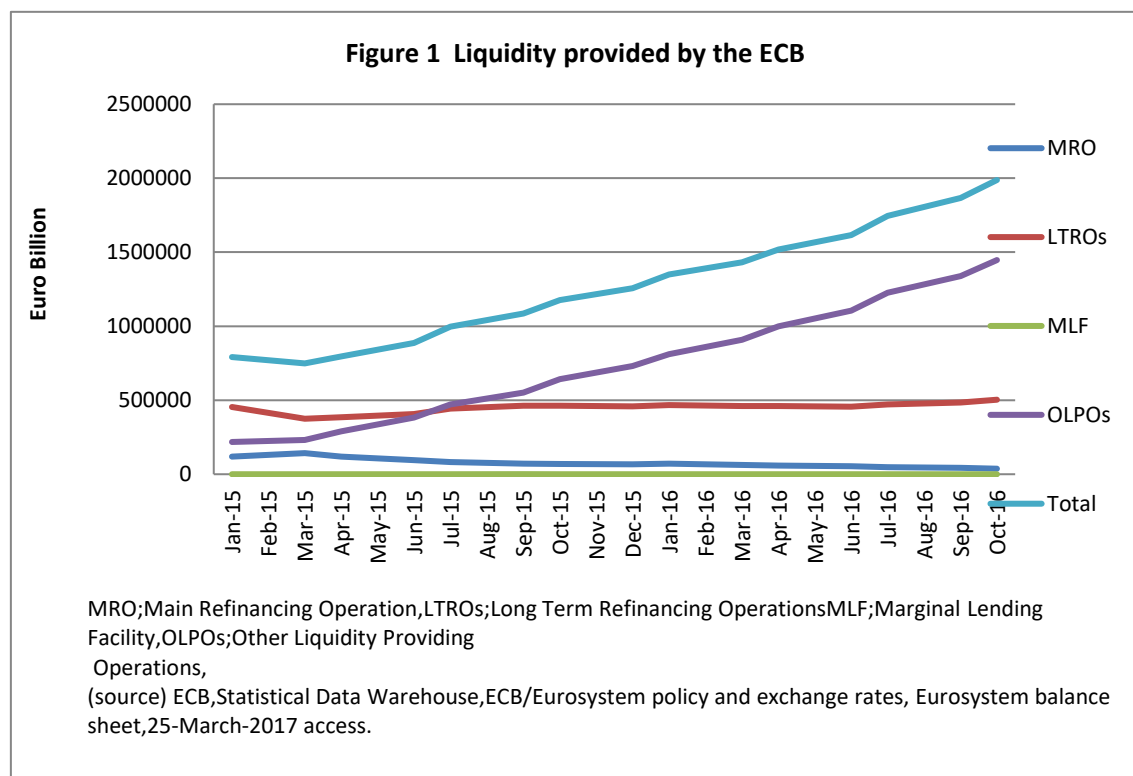
The central bank's purchase of government bonds causes an increase of monetary base and money stock. As the ECB started the massive purchase of government bonds from March 2015, monetary base has grown dramatically. The monetary base volume expanded in double from 12.6 trillion euro in March 2015 to 24.1 trillion euro in January 2017⁹. **Figure 1** shows that the main factor of the increased monetary base is "Other

⁷ Bank of Greece, HP.

⁸ ECB,HP,statistics,ECB/Eurosystem Policy and exchange rates,key ECB interest rates,12-April-2017 access.

⁹ European Central Bank Statistical Data

Liquidity Providing Operations” which includes liquidity provided under the Eurosystem’s asset purchase programmes.



Because the ECB’s direct purchase of bonds from the governments is prohibited by the Maastricht Treaty, the ECB has to purchase government bonds from the secondary market. However the Bundesbank criticized that the ECB’s purchase of bonds violates the Maastricht Treaty for the reason that the ECB’s purchase applies for the direct financing of the nations.

Then the question is what the distinction between the ECB’s direct purchase of government bonds from the government and the ECB’s purchase of bond from the secondary market is. Theoretically the two measures have the same impacts on the monetary base volume and money stock volume as explained in **Figure 2.A** and **Figure 2.B**.

Warehouse, http://sdw.ecb.europa.eu/browseChart.do?node=1497&SERIES_KEY=123.I.LM.M.U2.C.LT00001.Z5.EUR, 1-March-2-17 access.

Figure 2.A Buying operation

	Central Bank		Private bank (A)		Government	
	asset	liability	asset	liability	asset	liability
①		PBD 20	CBD 20			
②		PBD 10 GVD 10	CBD 10 Bond 10		GVD 10	Bond 10
③		PBD 20	CBD 20 Bond 10	CUD 10	Exp 10	Bond 10
④	Bond 10	PBD 30	CBD 30	CUD 10	Exp 10	Bond 10

* PBD: private bank deposit, GVD: Government deposit, CBD: Central Bank deposit,
Exp: expenditure, CUD: current deposit

①: initial stage,

②: Government issues 10 million euro public bonds, and bank(A) buys bonds

③: Government expend 10 million euro and a private sector deposits funds into bank(A).

④: Central bank buys 100 million bonds.

In stage ④, monetary base(= private bank's deposit on Central bank's liability) increases by 10 billion from stage①. Money stock volume increases by 10 billion from stage①.

Figure 2.B Central bank's purchase from government

	Central Bank		Private bank (A)		Government	
	asset	liability	asset	liability	asset	liability
①		PBD 20	CBD 20			
②	Bond 10	PBD 20 GVD 10	CBD 10		GVD 10	Bond 10
③	Bond 10	PBD 30	CBD 30	CUD 10	Exp 10	Bond 10

①: initial stage,

②: Government issues public 10 million euro bonds and Central bank directly buys 100 million bonds from Government.

③: Government expend 10 million euro and a private sector deposits 10 million euro on bank (A).

In stage③, monetary base(= private bank's deposit on Central bank's liability) increases by 10 million euro from stage①. Money stock volume increases by 10 million euro from stage①.

Section 2. The impacts of the QE

2.1. Mapping the impact channel of the QE

In the ECB' official announcements on the QE, transmission mechanism of monetary policy has been repeatedly presented to be a central part of the policy.

The transmission mechanism describes how the QE should cause an increase of consumer prices through purchase of government bonds. The transmission mechanism

is characterized by long, variable and uncertain time lags. Deutche Bundesbank Report explained the process and theory of the ECB's monetary policy transmission mechanism in details¹⁰. It shows that a change in asset prices and yields through the portfolio rebalancing channel and the signaling channel creates the conditions under which the QE can be transmitted through other channels such as the balance sheet channel. The main channels and theories of the process are showed as below.

The portfolio rebalancing channel

In the absence of Wallace neutrality, the QE policy causes investors to adjust their portfolios in various ways; this is reflected in relative yield shifts for individual asset classes and, above all, a flattening of the yield curve. This portfolio rebalancing channel is based chiefly on what is referred to as the preferred- habitat theory¹¹ to explain the yield curve, which combines the liquidity premium and market segmentation theories.

In this environment, the purchase of long- term government bonds influences the yield curve via several channels. On the one hand, purchasing long- term bonds lowers their supply in the market (segment) in which the purchases take place. Market segmentation means that investors with a preference for these bonds will be prepared to pay a higher price¹². If investors buy the bond, the bond price goes up. This reduces the yield not only on this bond class but also on close substitutes (segmentation theory). If, on the other hand, the central bank purchases very large volumes of long-term bonds, the average maturity of the portfolios held by investors will falls (liquidity premium theory)¹³. The fall of liquidity premium induces the fall of the aggregate term premium. Thus, the fall of long-term bond yield influences other bonds yields.

The report states that portfolio adjustments and therefore a potential fall in long-term yields can be triggered in an environment in which negative interest in applied to central bank balances and in which the level of excess reserve held by commercial banks is high¹⁴.

The signaling channel

The signaling channel is based on expectations theory, according to which the long-term interest rate is approximately equivalent to average short-term interest rate expectations. If, in addition to communicating the future evolution of policy rates (forward guidance), the central bank announces that it intends to purchase assets,

¹⁰ Deutchebank,Monthly Report,June 2016,pp29-53.

¹¹ Vallante,D.(2015),p.10.

¹² Deutchebank,Monthly Report June 2016,p.34.

¹³ Ibid,p.34

¹⁴ Ibid,p.35.

market participants could interpret this as a further indicator of an expansionary monetary policy stance being maintained for some time to come. This would imply that what is being communicated is backed by concrete measures, supporting market participants in their perception of the future path of policy rates¹⁵

The balance sheet channel

The bank capital channel attributes special importance to a commercial bank's balance sheet position. If asset prices increase as a result of purchases, the assets of a bank, too, will increase. All other things being equal, the resulting profit has the effect of increasing commercial banks' capital. This increase enables commercial banks both to meet the higher capital requirements of a growing loan portfolio and facilitates their access to the funding needed to refinance their loans to enterprises, increasing banks' willingness to provide credit¹⁶.

Functioning of the monetary transmission mechanism differs in terms of degree and speed in the euro-area. The reason is expressed in the speech of President of the Deutsche Bundesbank, Weidmann saying that the national financial systems still differ significantly within the euro area, and member states retain a large degree of autonomy in fiscal and economic policy, which favours the existing decentralised setup¹⁷. Recognizing this feature, we move on an empirical analysis on the QE.

2.2. The empirical evaluation on the monetary side and real economic side

The market interest rates

An analytical decomposition of the change in the ten-years interest rate only allows a distinction to be made between the contribution of interest rate Expectations and term premium. The results suggest that the decline in the ten-years interest rate was attributable to both a lower term premium and declining interest rate expectations, with the term premium initially of great importance since July 2015¹⁸.

Long-term government bonds yields converged among the euro-area except for Greece from January 2012 to April 2015. After a temporary yield hike at the third Greek financial crisis in July 2015, long Term Government bond yield of the most of euro- area countries have gradually gone down but bond yields of Portugal and Greece have gone up since July 2015. Thus, there has been a disparity of bond yields among euro-area

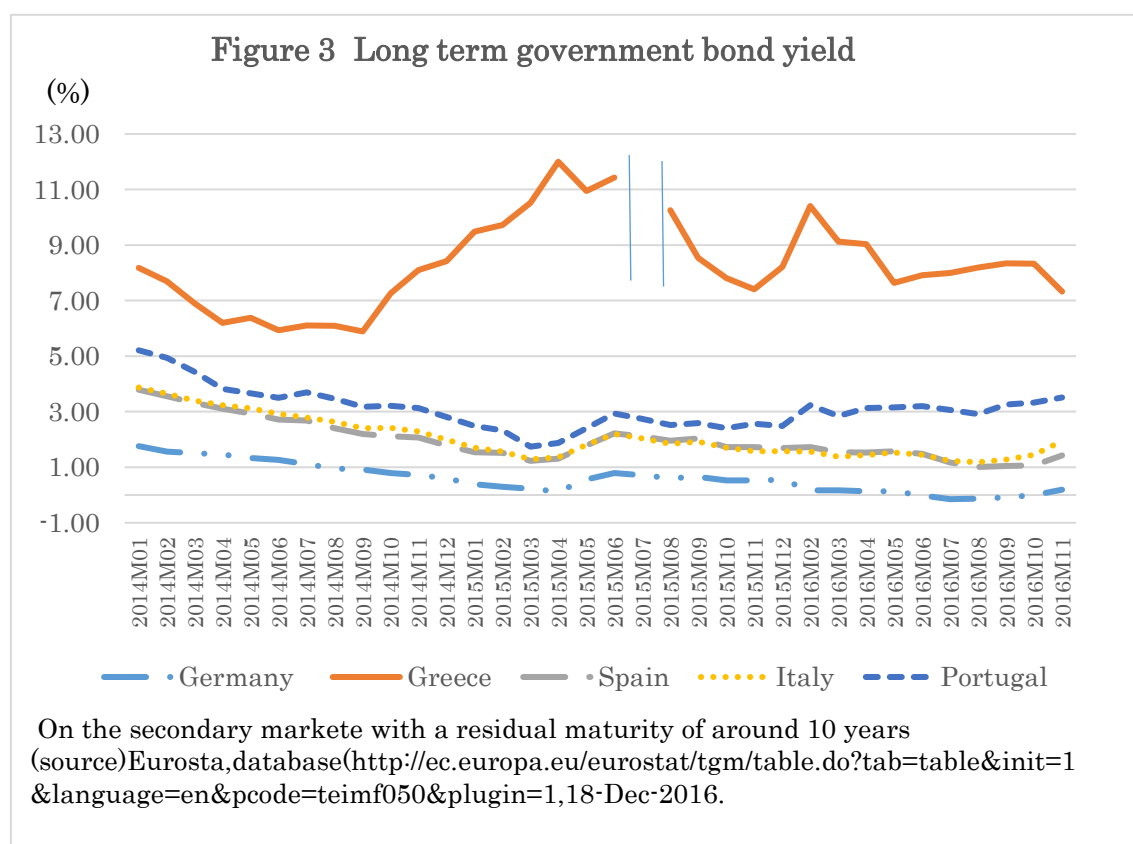
¹⁵ Ilib,pp.35-36.

¹⁶ Ilib,pp.37-38.

¹⁷ Weidmann,J, 20.03.2012.

¹⁸ Deutsche Bundesbank,Monthly Report,June 2016, pp.39-40.

nations due to a great credit risk of these nations (**Figure 3**).



Bank lending rates for non-financial corporations(NFCs) declined gradually from the late 2011. Since the announcement of the ECB's credit easing measures in June 2014, composite bank lending rates for loans to NFCs and households have decreased by significantly more than market reference rates, signaling an improvement in the pass-through of monetary policy measures to bank lending rates¹⁹.

However, the Deutsche Bundesbank reported that the interest rates on corporate loans remained relatively unstable and did not change very much in many countries since 2015²⁰. To put it more precisely, bank lending rates have fluctuated in some nations. This trend implies unstable lending market condition since 2015 in the short term.

In an analysis of the impact on the market interest rate, the impact on the real interest rate is more important to analyze the impact on the real economy. Gross, D argues that real interest rates are the key variable for savings and investment decisions and

¹⁹ ECB Economic Bulletin, issue 2,2017,p.31.

²⁰ Deutsche Bundesbank,Monthly Report,June 2016,p.40. The same trend can be seen in the data as follows. Banco Portugal, Statistical Bulletin-February 2017,p38, A9 Banking and deposit, BANCO DE ESPANIA, Statistical Bulletin,December,p.318.

estimates of the equilibrium long term real interest rate today are highly uncertain in a global market. He concludes that with integrated global capital markets national monetary policy can no longer be expected to have an impact in bond yields at home. Activism by the ECB, for example, extending the bond purchase programme, might thus be largely ineffective²¹.

The impact on the real interest rates due to the QE is a one of crucial factors which influences the investment and saving, thus influences the production.

The influence on the real economic side

The ECB's intervention in security debt markets has influenced to monetary aspect of the transmission mechanism differently in the euro-area. Thus, it is reasonable to imagine that the impact on the real economic side also differ within the euro-area. In addition to it, as stated before, it is expected that the impact on the long term real interest rates are limited in the euro-area. Moreover, real interest rates are one of factors which drive investment. That is, the key decision variable for investment decisions is usually the expected rate of return from a project relative to the weighted average cost of capital (WACC), the weighted average of a company's debt servicing costs and its cost of equity. When the equity risk premium goes up, the WACC increases vis-à-vis the risk-free rate, making corporate investment less attractive. Gros,D pointed that the increase of the equity risk premium has affected the WACC in a global market²².

Based on limits of the analysis, however, macro-economic data will be analyzed to present an empirical evaluation of the QE' impact on the real economy because the aim of this article is evaluate the effect of the QE in the euro-area as a whole.

Monetary Stock, credit condition

The ECB's asset purchase of public bonds increases both monetary base and money stock. An increase of money stock occurs after the government spends funds which are raised by issuing public bonds. Then the central bank's purchase of public bonds increases monetary base, that is, increases private banks' deposit on the central bank.

Annual M1 growth and M3 growth decreased during 2013, and started to increase from April 2014. M3 growth rate increased from April 2014 to April 2015 and remained around 5% annual rate since April 2015 to February 2017. M1 growth rate increased from April 2014(5.2%) to July 2015(11.4%) and remained between 8% and 11% since the

²¹ Gross,D.,No.426,September 2016.

²² Ibid,pp.8-9.

2015 summer²³.

ECB Economic Bulletin (issue 21/2017) shows that among the M3 counterparts, the Eurosystem's purchases of general government debt securities, mainly in the context of the ECB's public-sector purchase programme (PSPP), contributed positively to M3 growth. In addition, M3 growth continued to be supported by domestic counterparts other than credit to general government. This was driven by the ongoing recovery in credit to the private sector, together with the persistent contraction in MFIs' longer term financial liabilities²⁴.

What is noteworthy is an increase of loan by credit creation since March 2015. This trend indicates that the QE contributed to the increase of money stock by banks' loan through some channels.

Growth rate of credit to euro-area residents by MFI was minus 0.4% in 2014, 0.6% in 2015, and 2.2% in 2016²⁵. The increase of bank loans is attributed to an increase of money demands which is caused by the real economic recovery.

The GDP growth rate and the consumer prices

The GDP grew moderately in the euro area. The GDP growth rate was 1.2% in 2014, 2.0% in 2015, and 1.7% in 2016. The evolution was marked by a relatively increase in moderate gross fixed capital formation and a weak recovery of private consumption since 2014²⁶. Despite of the moderate GDP growth, Consumer Prices has remained at levels close to zero and minus till May 2016. HICP started to rise gradually since 2016 summer and increased further to 2.0% in February 2017. However The increase of the period was mainly driven by energy prices rise and ,to a lesser extent, food prices rise²⁷.

The increase of monetary base directly doesn't increase banks' lending. But banks' excess reserve which is induced by the creation of monetary base is the fund sources for bank lending through credit creation. The reduction of long term government bonds yields contributed to the gradual reduction of interest rates of private banks' loan. The decrease of banks' lending interest rate is one of factors to increase the expected rate of profit of firms and to expand household spending.

The money demands can be noticed from money borrowers on the MFI's balance sheet. Among credit to other euro area residents, financial corporations and debt securities

²³ ECB, Statistical Data Warehouse, Money, Credit and banking, 28-March-2017 access.

²⁴ ECB, Economic Bulletin, issue 2/2017, p.27.

²⁵ ECB, Economic Bulletin, issue 2/2017, S 20.

²⁶ ECB Economic Bulletin, Chart 11, issue 2/2017, p.16.

²⁷ ECB, Economic Bulletin, Chart 16, p.21, Eurostat, HICP (2015 = 100) - monthly data (annual rate of change) Last update: 31-03-2017, 7-April-2017 access.

contributed positively to credit growth²⁸. This data indicates that money can be used to invest securities, real estate and commodities, which intensifies volatility of assets prices.

Section 3. The implication of the QE

3.1. The Deuthe Bundesbank view

① Weidmann argued that the government bond purchases by the ECB blur the boundaries between monetary and fiscal policy. He pointed out two issues as to the ECB' government bond purchases. One is that the ECB's holding of public bonds would distort an order of the government bonds' markets and make it difficult to exit the QE. Weidmann said in his speech as follow.

Central banks are becoming countries' biggest creditors. And once finance ministers get used to the favourable financing conditions, there is a danger that monetary policy will be harnessed to fiscal policy and will be put under pressure to make high levels of debt sustainable through low interest rates. That would make it increasingly difficult to exit the ultra-easy monetary policy. Monetary policy measures that seek to improve the situation in individual member states in a targeted way are particularly problematic. That would be the case, for instance, if central banks were to buy only bonds issued by the governments of crisis countries, as was the case with the Eurosystem purchases in 2010 to 2012²⁹.

The other issue is the influence of the government bonds' market risks. Weidmann stated as follow.

Such purchases may cause a redistribution of fiscal risks through central bank balance sheets, as, ultimately, taxpayers in the member states are on the hook for potential central bank losses. I have already explained that redistributing fiscal risks is alien concept to the existing regulatory framework of monetary union, which is based on the principle of individual national responsibility, and would probably be counterproductive. If, however, decisions on redistribution are to be taken, then at least they should be taken by those with the legitimacy to do so. Those people sit in governments and parliaments; they do not work at central banks³⁰.

If the ECB suffers from capital loss of the bonds, the government needs to compensate for the losses. Finally, nations need to pay tax to clean the government's debt. Nobody can deny a possibility of such an abnormal rise in bond yield hike which would cause

²⁸ ECB Economic Bulletin, issue 2/2017, S 20.

²⁹ Jens Weidmann, 15.09.2016.

³⁰ Ibid, Jens Weidmann, 15.09.2016.

the ECB's capital loss.

② Bank profitability decrease

Weidmann pointed that banks suffer from a decrease of profitability in the ultra-easy mode. Most banks find it difficult to pass on the negative interest rates to their depositors. Banks suffer from a decrease of income that is generated through their bond purchase because the Eurosystem's bond purchases depress long term interest rates. Those banks with a lower portability find it difficult to strengthen their capital base.

Of course, as a central banker, I am not concerned here with the profits that the banks make. From a monetary policy perspective, however, it is crucial that banks transmit monetary policy stimuli – and this depends partly on their capital base. For only banks with sufficient capital can issue loans to enterprises and households³¹.

With regard to bank profitability, Demartzis,M and Wolff,G.B. shows that bank profitability of euro-area (quarterly profile up to Q2 2016) has improved since Q4 2015, but the level is still below Q1 2015 level³².

When rates of consumer prices are minus, the burden of real interest rates increases for borrowers. As the result, as borrowing demand decreases, banks' lending volume decreases. In addition to it, since banks cannot pass all of losses resulting from minus deposit rate on the ECB to private depositors, then interest rate income of banks decrease. Therefore, banks tend to go to risky business.

3.2. A potential risk of the asset prices bubble

The ultimate goal of the QE is to increase consumer prices and the nominal GDP. In fact, the GDP growth rate has been gradually going up and HICP has been increasing since the Ultra-QE (started from March 2015), while the QE monetary policy causes a potential risk of asset bubbles. The ECB's purchase of government bonds increases monetary base. An increase of excess reserve of banks created by bonds sale to the ECB can be used as source for security and real estate investment.

A Social demand for money is divided into a general commodity transaction use and the other uses. Regarding with the other uses, take a security circulation for example, if the securities prices and the security transaction volume increase, the money

³¹ Ibid,Jens Weidmann,15.09.2016.

³² Demertzis,M.and Wolff,G.B.,Brugel Policy Contribution, Issue No.20,2016.

demand for a settlement should increase. If a bond yield is expected to increase in the future, people want to hold cash for portfolio investment. This money exists outside of the general commodity circulation.

Moreover, excess reserve created by sale of government bond can be used as source for money creation which increases bank lending. As indicated in section 2, banks have increased lending to financial corporations and debt securities. Money circulates in the security markets through these non-banking corporations, which leads to an expansion of the security transactions.

In the wake of an increase of money stock and the negative interest rate, investors have increased investment for securities and real estate. Financial Stability Review states that in an environment of overall subdued yields on debt instruments, investors have gradually been taking on higher credit and duration risk in their portfolios in 2016. This has been the case not only for investment-grade bonds, but also riskier segments of global fixed income markets. It shows that the prices of bonds and stocks in the euro-area kept moving up slowly with great volatility³³

The crucial issue is that bank's excess reserve created by purchase of government bonds can be used a source for money creation. The momentum of monetary base creation should be the central bank's discount of the commercial bill on the condition that firms produce commodities, in other words, that added value is produced by firms in the market. Assuming that the firm produces a commodity, the firm sells it to a trader for exchange of a commercial bill. If the bill is offered from the firm to a bank for discount, the bank provides funds to the firm (a bill holder) by creating the firm's deposit. Then, if the bank needs cash instead of the bill, the bank requests the central bank to rediscount the bill. In this case, monetary base created by the central bank corresponds to the commercial bill which is issued in exchange for commodities with added value.

However, the ECB's public bond purchase means that the creation of monetary base corresponds to the government bond. The point is that government bonds are only guaranteed by the government's credit, and are not backed up by the added value which is produced by human's labour. As money stock which is equivalent to the monetary base circulates in the asset markets, the increase of money stock maintains assets transaction and an increase of assets prices.

Conclusion

³³ ECB, Financial Stability Review, November 2016,p.7.

Shlichter,D.S. a pointed out that the QE causes a potential risk of higher inflation. Shlichter argues that the ECB started using the printing press with the explicit objective of propping up government bond prices and managing interest rates on government debt to lower levels. He concludes that the funding of the states by ongoing money production from the central bank is simply a logical extension of the idea behind the present monetary system³⁴. Since the printing press causes inflation by weakening the purchasing power of the monetary unit, fiat money systems have historically always led to high inflation, ending usually in total collapse³⁵. He warns that this argument is true for the present system.

Hyperinflation doesn't occur in the present QE, however excess reserve created by the ECB's purchase of government bonds is used as source of credit creation for financial assets investment and real estate investment, thus money circulates in those markets. Therefore, the QE sustains the high level of asset and real estate prices. With regard to the side effect of the QE, governor of Federal Reserve Bank, in case of the Federal Reserve Bank of the USA, Stein criticized defects of inflation targeting of the central bank that excess reserve injected by the central bank circulates not only through loan to private sector but also through assets investment and the financial technology³⁶. His argument is applicable to the ECB' QE. Once the asset prices and housing prices start to increase with euphoria spreading, it is difficult for the central bank to regulate banks' credit expansion. The asset bubble will be repeated.

Since the government bond yields are minus due to the QE, the government bonds holders are levied tax by the government. That means that governments' debts will be gradually reduced by levying tax on holding of governments bond. When hyperinflation hit the German economy in the 1930's, the government outstanding obligation was dramatically reduced at the cost of asset holders' loss in the short term. However, we should notice that the negative interest rate substantially means that financial assets are levied tax, by which the government reduces its outstanding obligation at the cost of taxpayers in the long term. Although the QE has contributed to lowering market interest rates and easing of credit markets, the side effects of the QE cannot be ignored to assess the QE as a whole.

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Cinzia Alcidi, Matthias Busse and Daniel Gros, 'Is there a need for additional

³⁴ Detlev S. Shlichte,2011,pp.229-231.

³⁵ Ibid,p.232.

³⁶ Jeremy C. Stain,February 07,2013,

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Abstract

The ECB has implemented Non-Standard Monetary Policy measures to prevent sovereign crisis and liquidity crisis, to sustain price stability and the financial system. The Non-Standard monetary policy was conducted in the form of Quantitative Easing policy. The main purpose of this article is to evaluate the effects and the side effects of the Quantitative Easing monetary policy in the euro-area after the financial crisis. Although the QE has contributed to lowering market interest rates and easing of credit markets, the side effects of the QE cannot be ignored to assess the QE as a whole. The article addresses that the QE monetary policy increases a potential risk of asset bubbles as side effects.