Università degli Studi di Macerata

Dipartimento di Economia e Diritto

Negative interest rates on deposit facility in the Eurozone: a failed attempt to revive the unsecured interbank market

D. Tropeano

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Abstract

The paper reviews the negative deposit facility introduction in the Eurozone and tries to explain the rationale behind that decision. The usual explanation that the negative rate on deposit facility improves the transmission mechanism of monetary policy and contributes to the economic recovery of the area is rejected. In turn the rationale for such a policy is found in the interbank market. The malfunctioning of the interbank market among European banks dates back to the inception of the global financial crisis in 2007. The negative deposit facility rate is inserted in the frame of the monetary policy conducted by the ECB since then. Rather than being a conventional policy as some scholars have argued that policy is considered in this paper deeply unconventional because it does not target any more the overnight interest rate as the interbank market has practically lost in importance and size. The negative policy rate thus appears as an extreme attempt at reviving the unsecured interbank market, which, however, has failed.

Introduction

In this paper the policy of negative interest rate on the reserve facility at the European central bank is examined. Most studies on that topic either highlight the usefulness of that policy to induce banks to expand credit to the real sector or, particularly on the Post-Keynesian side, argue that reserves do not fund loans (see Fulwiller 2009, Rochon and Rossi 2007) and therefore no expansion in loans is to be expected by a measure that should reduce reserves sitting idle in the central bank.

I will deal with this policy not in general but with particular attention to the institutional circumstances in which it has been implemented, in the context of a dysfunctional currency union and of tensions in the governments bonds and interbank markets. It will be argued, that, while the central bank has in fact replaced the interbank market and still does, it continuously strives to resurrect its functioning and to return to normal circumstances. Perhaps the reason is that, though central banks may provide financing to banks directly and without using markets intermediaries, they think that markets are always better because of the "efficiency and price discovery" neoliberal mantra. It will be shown that the negative interest rate on deposit facility policy was intended as a sort of punishment for core countries central banks that after the tensions in the governments bonds markets had given up lending in the interbank market to their peripheral countries peers. That punishment should have had the effect of resuming the normal functionality of the interbank unsecured market. Actually it did not but the ECB authorities are claiming that the combination of asset purchase program and negative rates, both on deposit facility and on borrowing under long term targeted refinancing II, has yielded all desired results. It will be shown that indeed it has not as the central bank still replaces the market and the lack of trust in the continuation of the common currency experiment jointly with the new measures on the resolution of banks have contributed to a

renewal of the capital flight from peripheral countries and to an increase in TARGET2 negative versus positive balances again.

In order to assess the rationale behind the negative deposit rate policy of the ECB we will discuss the evolution of the monetary policy carried out by the ECB since the inception of the great financial crisis started in 2007. The negative rate policy will be explained in the frame of a disappearing and shrinking interbank market and of growing TARGET2 imbalances.

1 The negative interest policy in the context of a shrinking interbank market.

Changes in Monetary policy in a shrinking interbank market.

In order to explain the reason why the ecb decided to charge negative rates on the deposit facility we have to give a description of the changes in monetary policy that were implemented by the ecb during the great financial crisis among which the most important was the introduction of fixed rate full allotment long term refinancing in 2011 and 2012. The sum borrowed by banks through these two long term refinancing operations amounted to roughly 1 trillion euro. This of course heavily changed the normal shorter term refinancing operations that were carried after that. We argue that the traditional interpretation of the monetary policy goal according to Post-Keynesian endogenous money theory applies to those main refinancing operations but it does not to the longer term refinancing operations.

This view contrasts with the one expressed by Febrero et al.(2013) on the same topic. They have written the monetary policy carried out by the ECB until 2014, when negative interest rate have been introduced, cannot be considered unconventional as its main aim is to affect the level of the overnight rate that is the traditional aim of central banks in normal circumstances.

In particular, Febrero et al. (2013) argue that the ECB has responded decisively in order to keep some control over the overnight interest rate and to keep the payment system running smoothly. In this action the central bank would act in a rather conventional way that is influencing through

monetary policy instruments the demand and supply of reserves such that their price, the overnight interest rate, be close to its target level.

Here it will be argued that the main aim of the central bank was to maintain smooth the payments system and to allow German banks to be repaid from peripheral countries banks thus avoiding a full blown banking crisis in core countries. The full allotment policy was part of that strategy. Given the amount of capital outflows from peripheral countries only unlimited sums lent could solve the problem of allowing an orderly repayment of loans contracted in the past by peripheral countries banks. This cannot be considered conventional policy as this was made without targeting the overnight rate because the latter was no more meaning nothing.

If the Bindseil definition quoted by Febrero et al. (2013) were to be trusted then the overnight rate would be determined by a supply and demand for reserves both functions of the interest charged for them. There is no doubt this is how the interbank market works in normal circumstances. The conditions that the interbank market experienced were however not normal. There has been a gradual but steady shrinking of the size of the market. The lack of reciprocal trust has led to the very destruction of the market in a way similar to the process described in the paper by Akerlof on the market for lemons. The supply of funds on the unsecured market had fallen and the demand too as many banks were satisfied by the longer term refinancing operations. In any case even if the demand had persisted there would have been a sort of credit rationing equilibrium, in which, as it is well known from Stiglitz and Weiss seminal model, the price does not clear the market (see Stiglitz and Weiss 1981). So the overnight rate was determined in a thin market from which many buyers and many sellers had withdrawn and that market was not very representative of demand and supply conditions. So rather than using the word segmentation I would stress the shrinking and almost destruction of the market. The word segmentation instead applies very well to the secured interbank market. The secured interbank market grew in size in parallel with the shrinking of the unsecured one. That market experienced an increase in segmentation along national lines. In the secured interbank market the banks providing, as collateral, peripheral countries' governments

bonds were penalized by higher borrowing rates than those charged to banks offering core countries government bonds as collateral.

In a way there was no function for the interbank market and the central bank had replaced it. The aim was to get the repayments to the core countries banks be made even under funding difficulties so that the common currency could survive.

This type of policy should be considered unconventional but not in the definition that Febrero et al.(2013) give of the word. Febrero et al.(2013) refers to the distinction made by Lavoie (2010) between monetary policy regimes and to the change in the corridor system that would have been caused by the crisis. During the crisis almost all central banks in the world were no more trying to get an overnight rate near to their target level by changing the supply of reserves at the fixed rate but they would have resorted instead to a policy called floor system. That policy aimed to achieve their objectives on short and long run interest rates and prices of assets and consisted of injecting as many reserves into the system as were necessary to that aim. A consequence of this change in policy was that the interbank overnight rate sled downwards in the corridor towards the deposit rate on reserves. Both rates, the overnight interest rate and the deposit rate on reserves at the central bank, then tended to be very near at the floor of the corridor. This is the reason why that policy is also called floor policy. It is unconventional because it increases reserves at banks even if they do not wish to hold them. It could well apply to the experiences of quantitative easing in the UK and in the US. During the so-called quantitative easing the central bank purchases massive quantities of government bonds.

In that respect it is true that the policy carried out by the ECB before 2014 is not unconventional in that meaning of the word. That policy however resembles the policy carried out by the Federal Reserve in 2008 when it bought in the market all the mortgage backed securities that were no more accepted as collateral for financing between banks and non bank financial institutions. In the Eurozone being the non bank financial institutions a much smaller share of the total finance the problem was strictly in interbank financing and the lack of trust between different segments of the

banking universe. In order to resolve the problem the Fed first replaced the securities that were no more accepted as collateral with Treasuries and then bought them directly on the market and kept them in its balance sheet. The ECB had a simplified problem as the actors in the financial world were mainly banks but the problem of distrust among them was identical to the one the Fed had to face. In these peculiar circumstances the only unconventional policy the ECB could carry out was plainly to replace the interbank market by offering all the financing it was requested for a very long term and to enlarge the basket of assets that could be provided as collateral for those loans. This was the sense of the full allotment long term refinancing policy. That policy in turn gave rise to Target 2 imbalances that were not present before in the Eurozone:

> "However, the current high levels of TARGET balances reflect the supportive role played by the Eurosystem in relation to the banking system and its intermediation role on the money markets during the ongoing financial market tensions. To some extent, TARGET balances thus constitute a substitute provided by the public (central bank) sector for what would normally be private claims among commercial banks, with associated implications in terms of risk shifting from the private sector to the balance sheet of the Eurosystem." Ecb 2013 p.112

The report adds:

> "As illustrated above, the presence of TARGET imbalances is in fact strongly connected to the nonstandard measures taken by the Eurosystem (fixed-rate, full allotment procedures, an expanded collateral framework, long-term refinancing operations) and, just as these measures are by design temporary, the concurrent TARGET imbalances can be expected to decline to levels more consistent with historical norms as financial market conditions normalise." Ecb 2013 p.112

That policy however totally discarded the interbank market and the corridor system and in that sense was deeply unconventional. What distinguishes it from the floor policy is that the reserves were not forced upon banks they were granted on demand so the traditional post-Keynesian horizontal supply curve for reserves still applies for the whole Eurozone. So, if this interpretation is correct, the ECB was *not* targeting an overnight rate and so conducting a conventional policy at that time. On the contrary Febrero et al. argue that the ECB was conducting a traditional conventional policy as it was trying to affect the overnight interbank rate through its long term fixed allotment refinancing measures. They add that the target overnight rate was so reached for the

periphery countries interbank market while in the core countries the target was far higher than the actual overnight rate. If the central bank had restricted the supply of reserves the overnight rate in the peripheral countries would have risen to levels higher than the target and the payments system would have been disturbed.

Two things are not clear in this vision. There is only one interbank market but its functioning during the crisis was disturbed as some banks were no more receiving interbank loans from their peers with excess reserves. The consequences of that malfunctioning however were not reflected in the prices of unsecured loans of reserves in different markets, as Febrero at al. (2013) argue, but rather in the disappearance of the market or at least in its shrinking in size. The volumes of transactions were severely reduced while the price did not show big rises. Given the withdrawal of many institutions from the market due to lack of trust and similar problems, the price could not clear the market. To peripheral countries banks the overnight rate was no more important as they demanded cheap long term funds from the ECB and were satisfied in full. They did not need any more to demand short term funds on the interbank market and on the other side the supply of those short term funds at any rate was not available for any bank. Given the shrinking of the market the central bank did not need to inject reserves to ensure that their objective of overnight rate was achieved at least in the peripheral countries. The central bank was simply accepting any demand for reserves that was advanced by any institution able to provide the collateral deemed eligible for the demand. The unsecured short term interbank market practically disappeared so it would have not been reasonable to try to affect the price of a small volume of transactions. The segmentation instead appeared in the secured interbank market in which loans secured with collateral consisting of core countries government bonds were granted at a lower rate than loans secured with peripheral countries government bonds. To that segmentation contributed the ECB itself as among the measures taken during the crisis there was a higher haircut for peripheral countries government bonds when used as collateral to back official ecb financing while before it all bonds were

considered as having the same value as collateral for ecb financing. The demand and supply of secured loans however did not depend on the overnight rate.

Therefore the representation of the market for reserves given in the graphs by Febrero et al. (2013) does not seem adequate to show what indeed happened. They insist that the horizontal supply of reserve typical of the post-Keynesian tradition applies only to a part of the interbank market that of banks in peripheral countries while the banks in core countries were receiving more reserves than they wished to have through the target 2 system. So similarly to the unconventional policy representation in Lavoie (2010), Febrero et al (2013) draw a vertical line representing the supply of reserves in core countries. In contrast to Lavoie's (2010) floor policy graph however in the graph drawn by Febrero et al (2013) the vertical supply of reserves is cutting a downward sloped demand for reserves within a symmetric corridor system. The corridor had disappeared from Lavoie's (2010) graph as in the new policy it was supposed that the central bank does not target only an overnight rate and changes the supply of reserves to adjust it but is free to choose both a policy rate and any amount of reserves if the policy rate is zero or near to it.

I am arguing that the vertical supply of reserves is not needed to explain what happened. It is just sufficient the traditional Post-Keynesian story in which the supply of reserves is horizontal. The Target 2 imbalances that cause changes in reserves inflows and outflows may affect the demand for reserves lowering that of core countries and increasing that of peripheral ones at the same time. So the horizontal supply curve remains horizontal for core countries too but the demand curve shifts on the left side thereby producing a lower equilibrium quantity of reserves supplied and demanded than it would have been the case without the autonomous factors. The same can apply to peripheral countries banks. Their demand for reserves shifts on the right because of the autonomous factors that cause an outflow of reserves due to target deficits and the quantity demanded and offered increases.

They argue that the horizontal supply of reserves applies to one part of the interbank market while the vertical supply curve applies to the remaining portion. The demand for reserves is represented

instead in both cases by a downward sloping curve with steps that take into account the length of the maintenance period. So the demand curve is the same in both segments of the interbank market while the supply curve has a different shape for the two segments. I argue instead that the supply curve is horizontal for both segments while the demand curve is shifted on the right for peripheral countries because of the imbalances recorded in the target payments while is shifted on the left for core countries banks that see their reserves increase because of the same target imbalances in an automatic and specular way. Two different supply curves are not necessary to explain what happened.

Further not only the shape of the demand and supply curve for reserves lent by the central bank cannot be represented according to the idea of segmented markets but the very idea of inserting those curves in a figure in which is still present the corridor system does not fit the reality. Starting with the two big main refinancing operations with a very long maturity the central bank was not only providing the money to settle payments but was granting credit to the banks so replacing the failure of the financial markets. As Rochon and Rossi (2007, p.549) wrote the task of the central bank is not only to create the means of payment to be used to settle payments among banks but also to create or destroy credit thus partially replacing the financial markets when that is needed to ensure that the payments system works smoothly. To that aim the central bank may engage in repo and reverse repo operations with the banks. The ECB through the two longer term full allotment refinancing operations has indeed created credit for the banks without the need for the financial markets to intervene to ensure the repayment of that credit. During the crisis it seems that the only working circuit was the first one while the financial market mechanism was not working. The repayment of long term loans by the central bank was financed by another long term loan. The maturity was very long term, which is very unusual for normal reserve lending by the central bank, and several long term refinancing operations have been following each other so that the repayment of the first long term loan could be made by using a new long term loan. This has virtually replaced financial markets borrowing and lending. Undoubtedly however through the

longer term refinancing operations the central bank was both creating a means of payment to settle interbank payments but also granting long term credit to the banks against collateral. The two circuits that are described in Rochon and Rossi (2007) seem to collapse to one.

It is this granting long term credit that should be considered unconventional even if it does not entail the purchase of securities by the central bank. It is clear that by granting long term credit the central bank did not pay attention any more at the level of the overnight rate as the necessity of refinancing in the interbank market either secured or unsecured was no more compelling given the maturity of the financing by the central bank.

The central bank as a mutualizer of German banks losses.

The idea that the central bank actually replaced the interbank market is also accepted by a number of scholars discussing the relation between target 2 imbalances and the monetary policy by the ecb. Minenna (2016) convincingly argues by collecting data from banks balance sheets, central bank refinancing demands and Target 2 balances that the peripheral countries banks used part of the long term refinancing received by the ECB to return the funds they had previously borrowed to finance the trade imbalances of their countries with Germany.[i] He concludes that the ECB LTRO was used to transfer the credit risk of German banks to the Eurosystem. That risk was thus mutualized. That the liquidity provision by the Ecb through the long term refinancing operations acted as a risk shifting device is stressed by other scholars too (see Cour-Thimann, 2013; Cecchetti et al.2012). Cour-Thimann (2013) writes that target balances positive and negative accumulations were possible only because of the intervention by the ECB through its long term refinancing. Without that intervention creditors in surplus countries could not have recovered their claims on foreign debtors while debtors in deficit countries would have not been able to service their external debts previously contracted (Cour-Thimann 2013:24). Core countries residents would have not been able to withdraw their investments in peripheral countries. She adds however that this risk sharing was taken into consideration when European states decided to share a single currency.

Cecchetti et al. (2012) argue that Eurosystem credit has allowed the public refinancing of credit originally granted by German banks to peripheral countries. This may have happened also for credit granted by other countries banks (Cecchetti et al.2012:14).

2 The negative deposit rate on reserves as a tax on core countries banks.

In the context explained in the last section the introduction of a negative deposit rate can be interpreted as a means to revive the unsecured interbank market and thus to induce the core countries banks to lend their excess reserves that in between had piled up to peripheral countries banks. It was an extreme attempt to resurrect the unsecured interbank market across Eurozone banks. It was also a sort of punishment for the banks of the core countries that had withdrawn from the interbank market and had been saved in a way by the central bank intervening and replacing the market for a very long period. In terms of the two circuits described by Rochon and Rossi(2007) the central bank did not act following a defensive role. While it granted very long term credit to allow peripheral countries banks to pay back their loans to core countries banks it did not absorb the reserves that were created in the process and that ended up in the reserve accounts of the core countries banks. These reserves could have been absorbed through a reverse repo or by remunerating excess reserves. The ECB instead opted for the opposite policy that of introducing negative interest rate on the deposit facility. That decision was just the opposite of what would have been needed from a circuitist perspective.

Looking at aggregate data for the whole Eurozone some observers have wondered why banks should borrow large sum of reserves and then redeposit them at the central bank because the two transactions would bring only losses as the borrowing rate was higher than the deposit rate. The uneven distribution of reserves explains that apparent paradox. The banks that redeposited their excess reserves at the central bank are not those that borrowed them in the first place. The peripheral countries banks borrow the reserves that they need to be able to make payments to the core countries banks. The latter record inflows of reserves that are credited at their account with

their own central banks because of the same payments being carried out and settled. So since they do not need them they redeposit them at the same central banks.

This applied as well before the introduction of negative rates on deposit because the borrowing rate was higher than the deposit rate. In fact the corridor of rates did not exist any more as the deposit facility rate and the interbank short term rate were both aligned on the floor of the corridor. This situation was just the result of the central bank intervening and replacing the market as it was explained in ECB (2013) quoted above. It was no more necessary for the deposit rate to be lower than the interbank rate because even if the former had been higher than the latter this w ould have not induced banks to lend to each other in order to gain the difference due to the lack of trust and the fear of insolvency of counterparts in the interbank market. So in a way being the interbank market replaced by the intermediation by the central bank even its rate was no more important for the conduct of monetary policy.

The aim of monetary policy is no more to get the target overnight rate as before the crisis but to correct the disturbances arisen in the interbank market. This is explicitly stated by the Vice President of the ECB Constancio, who talks about the velocity of circulation of excess reserves:

> "Another effect of negative rates is to increase the velocity of circulation of excess reserves in the interbank market towards the banks that need liquidity to sustain or expand their credit portfolio. The banks with excess liquidity have an incentive to pass it on to other institutions to reduce the cost of paying for the excess reserves."

This in turn would signal the intention of the central bank to return to more normal times and to withdraw from the zero interest rate full allotment policy. This policy was initially adopted too to correct the malfunctioning of the interbank market (see ECB, 2013). If the ECB were to withdraw from the full allotment policy and the interbank market were not functioning smoothly the payments system in the eurozone would be negatively affected. Thus the restoration of the interbank market is a prerequisite for the return to a traditional policy targeting the overnight interest rate. The assumption underlying such a design is that the changes occurred during the crisis

and after that were only temporary and that it will be possible to go back to the pre-crisis normal situation as though no crisis had ever occurred.

This policy however overlooks the main events taking place in the financing of banks that is the increasing reliance on reciprocal secured borrowings as a form of financing particularly among big banks. International banks that need dollars more often than reserves in euro are leading this transformation.

The Federal Reserve by paying a positive rate on the deposit facility and by opening the access to that facility to non bank financial institutions and foreign banks is in a way trying to dry the source of financing of banks outside the domestic banking system and make them be "in the bank" again. The Federal Reserve is offering to non bank investment funds an allocation of their liquid funds that is alternative to short term lending through repo agreements to banks. In this way it compels the banks to come back to the federal funds market and restores the importance of that market. This is a way to come back to the old corridor system and to try to govern directly the financing of banks.

The European Central Bank by taxing the banks of the core countries with negative rates cannot hinder that this process of disintermediation of big commercial banks from the central bank continues. This will be accelerated by the type of change in regulation that has been implemented in Europe after the financial crisis (see Tropeano, 2017 forthcoming). It will be further accelerated by the European Union continuing support for mergers and acquisitions in the context of the project of a capital markets union and by the neglect of the too-big-to-fail problem in the regulation.

3 The interaction of negative deposit rate and asset purchase program.

In the last two years the asset purchase program has become the main source of autonomous changes to the supply of reserves and for the casual distribution of assets to be purchased it has determined again an increase in the reserves of the core countries and a fall in the reserves of the

peripheral countries. So the supply of reserves for peripheral countries may be a vertical line as supposed by Lavoie (2010) and Febrero et al (2013) because of the deliberate policy of asset purchase by the central bank with the aim of affecting the shape of the yield curve and lowering long term interest rates to stimulate investment. In this phase then the monetary policy would qualify for the adjective unconventional in the meaning it has been used in Febrero et al. (2013). The consequences of this asset purchase program is a redistribution of reserves among the banks of the Eurozone that takes the same shape it had in the years 2010-2013 with an outflow of reserves from peripheral countries banks and an inflow of reserves in core countries banks. This in turn is reflected in growing target imbalances that have reached a higher level than they had in 2013. Beyond that this unconventional policy does not have any effects on the credit supply and through it the level of macroeconomic activity contrarily to what researchers at the Ecb claim (see f.e. Casiraghi et al. 2016). Even if at the aggregate level the credit supply has given signs of recovery in the last two years its growth is unevenly distributed and holds only for the core countries, whose banks have always had excess reserves throughout the crisis and therefore would have not needed another round of them to grant credit. So far peripheral countries are concerned the situation is much different. In Italy, for example, more since 2014, more than €220 billion of mostly ECB funds have been channelled to Italian banks and enterprises in exchange for government bonds (see Minenna 2016). This did not cause an increase in loans to the private sector. The concomitant event was the change in the investment preferences of Italian households and firms that started to buy shares of investment funds issued by foreign entities or denominated in foreign currency. This in turn contributed to the growing target imbalances. Minenna (2016) seems to argue that the funds received by banks and enterprises as payment for the bonds they sold under the asset purchase program would have been used to buy those financial assets. This may hold for the enterprises though for the banks, in order for this reasoning to hold, one should assume that they were reserve constrained before those purchases. It is more likely that italians have decided to change the allocation of their savings for other reasons like the lack of a credible deposit insurance and the fear

of new tensions in the government bonds market. In any case the increase in reserves, as it was expected from a postkeynesian viewpoint, did not cause an increase in loans. Moreover Minenna adds that the modalities of implementation of the assets purchase programm, particularly the decentralization of the purchases, that are made by national central banks hinders any risk sharing in the eurozone. So, while investors are avoiding redenomination risk by buying foreign shares and bonds, the central bank is still exposed to that risk because it is a debtor to the Eurosystem. The entity of that debt depend on target imbalances.

Minenna (2017) adds that the target balances hedge the risk of redenomination for the ECB:

> "However, risks are not disappearing, but are shifting from the private to the public sector through the Target2 mechanism. The hedge that private enterprises and banks are obtaining from investing abroad is actually coming at the expense of the Bank of Italy, the ultimate guarantor of the ECB money that is making this deleveraging possible. From this perspective, the QE architecture via NCB purchases could be seen an effective way to segregate the financial risks of debtor eurozone countries within their national borders, with the Target2 balance seen as a measure of the nationalisation of these risks. No page"

As the asset purchase program reproduces the same mechanism that was in action during the European debt crisis the negative interest policy is essential according to ECB influential officials to redistribute reserves again between the different areas of the Eurozone:

> "ECB staff finds supportive empirical evidence for the empowering complementarities of our measures. For instance, banks in less-vulnerable euro area countries have been granting more loans to the real economy than would have been the case without a negative DFR. In addition, banks with large holdings of excess liquidity, in particular in less-vulnerable member States, were found to have rebalanced significantly more towards non-domestic euro area government bonds than they would have done in the absence of a negative DFR. Overall, the portfolio rebalancing effects, triggered by large-scale asset purchases have been strengthened in the euro area by the negative DFR."

The same point is stressed in the ECB annual Report (2016):

> "This comprehensive set of measures aimed at further ease private sector borrowing conditions and stimulate credit provision to the private sector, thereby reinforcing the momentum of the euro area recovery and accelerating the return of inflation to the desired levels. The measures also helped to mitigate pressure observed on the financial market earlier in the year and prevent it from undermining the pass-through of the accommodative policy stance (see Section 2.2 of Chapter 1). The cut in the deposit facility rate was intended to induce a further easing of credit conditions (see

> Chart 23). That is, banks with liquidity holdings above the minimum reserve requirement would be incentivised to use the liquidity either to purchase other assets or to grant more loans to the real economy. In this way, the negative rate on the deposit facility reinforced the APP by strengthening portfolio rebalancing effects." ECB 2016 p

This view conflicts with the data provided by the ECB itself on the distribution of penalizing negative deposit facility rates in the profits of banks (ECB, Annual Report 2016, Chart 26, p.54). The negative deposit facility penalizing rates affect particularly core countries such as Germany and France, that are also the ones in which the rate of growth of loans is positive. In other countries, such as Italy and Spain, banks do not suffer those penalizing rates while the rate of growth of loans is near to zero. It is doubtful that the banks of Germany and France would have granted less loans if the deposit rate were positive. The supply of loans depends on demand essentially. They are penalized by negative rates also because of the autonomous factors that increase their reserves and compel them to pay those negative rates. This is linked to the asset purchase program as most peripheral countries banks buy the securities from financial institutions located in core countries. This has contributed a return of target 2 imbalances. This feature of the asset purchase program causes an increase in demand for reserves by peripheral countries due to autonomous factors exactly as it has happened in the preceding period. The outflow of peripheral countries investors towards northern countries financial assets increases the inflow of reserves too. There is no virtuous effect on the real economy and investment. The money that is created by the euro-system is used to buy bonds and the purchase of bonds creates reserves for those institutions that sell them but the ultimate use of the eventual balance sheet expansion is to increase the demand for financial assets. It is all contained in the financial sphere. Being the core countries banks the ones that receive more reserves inflows via the target system and the ones who do not need them then a negative lending rate may be useful to compensate the negative deposit rate so balancing the accounts.

The purchase of government bonds of peripheral countries by core countries banks is seen as a sign that conditions have come to normal neglecting the fact that those purchases are aimed at making short run profits in the expectation of selling to the central banks of the peripheral countries that

have a scheduled and public purchase program. It is doubtful that those purchases will persist after the asset purchase program will end. So the portfolio rebalancing effect would not presumably persist if the expected capital gains were absent or, worse, replaced by the expectation of capital losses.

It is clear that the interbank market, especially its unsecured portion, is playing no role at all in the financing of banks as all the liquidity that is offered is provided by the central banks through the targeted long term refinancing operations. These operations jointly with the asset purchase programs flood the banks with excess liquidity and all rates are heading in the negative territory. At this point it is clear that the central bank is no more targeting an overnight rate and trying to reach it by setting the main refinancing rate. In the corridor of rates the deposit facility rate and the Eonia average rate for overnight unsecured loans both stay very near in negative territory. It seems that the central bank does not wish to change that situation, rather it encourages it. In this phase it is clear that the supply of reserves has become a vertical line independent of the main refinancing rate as the financing through this channel has become quantitatively irrelevant over the total supply of financing. The central bank once again replaces the market through the targeted long term refinancing operations. In this context the negative rates should help the portfolio rebalancing in the expectation that soon or later the private interbank market will resume its function.

The data on the repo market based on Eurozone government bonds as collateral are offering hints that the discrimination among Eurozone governments bonds has not ended (see ICMA 2017). The repo rates on general collateral are also in the negative territory following the other short term rates but their value is still lower than the deposit facility and the overnight Eonia average. This value refers to the general collateral pool in which the governments bonds of core countries only are included. The discrimination against peripheral countries governments bonds continues, the negative rates on deposit facility notwithstanding. The institutions that can provide this highly rated collateral and borrow by selling it with the promise of repurchase are awarded a higher premium than other borrowers.

As the new targeted long term refinancing operations have a four years maturity it is obvious to suppose that the interbank market will be replaced by this direct financing for the next years. The targeting of the financing means that the banks will receive the financing as a percentage of their stock of loans to the nonfinancial sector excluding loans to households for house purchase. So the financing has as higher limit a percentage of the stock of existing loans. This however does not restrain the use of funds that can be used to repay loans or to redeem securities as all other reserves are. The targeting then regards the stock of loans rather than the use of funds or the assets in the banks balance sheets. In the version of TLTRO of vintage 2016 there is an increase in the upper limit of the amount to be borrowed which becomes 30% of the stock of loans as of January 2016 and there is the provision of a negative borrowing rate that will be achieved only for those banks that will increase their lending by a certain percentage (see ECB undated). So the targeting in this case regards the destination of funds but only if the bank wants to pay a negative rate on borrowing rather than zero that is if it lends up to a certain percentage above the stock of loans it had in January 2016 it will gain from borrowing. Otherwise it may use the reserves for whatsoever use it wishes to unless it aims at gaining from the negative rate. For example, Italian big banks are taking a lot of refinancing from the TLTRO II although the rate of growth of loans in Italy is very low in the order of a few decimals in the positive sphere. The funds borrowed may be used to settle debts in euro contracted with other banks deriving from any type of transaction or may be used to replace the outflow of reserves due to the purchase program. The compelling nexus between reserve borrowing at a favourable rate and long term and the composition of assets by banks is not available in the scheme of targeted refinancing. The only clear point is that banks borrowing at such long maturities and at zero or negative interest will be able to settle any pending debts with other banks whenever they are located. The first long term full allotment refinancing operation allowed peripheral countries banks to repay their debts to core countries ones thus avoiding the stress to the latter and allowing an orderly payments system in the Eurozone to survive the crisis (see Minenna 2016, Tropeano 2017, Chapter 7 forthcoming). Behind the repayments were the trade

imbalances in the Eurozone and the capital inflows reversal due to the fear of a breaking up of the monetary union. Nowadays these two sources of payments seem to be strongly attenuated though the Target 2 imbalances persist and are increasing. The ECB argues that they are due to the asset purchase program though the diversification in the investment portfolios of some peripheral economies like Italy and Spain may have contributed to it. In particular the lack of a credible common deposit insurance scheme could have induced portfolio rebalancing towards shares of investment funds mostly located in foreign countries.

Trade imbalances have been strongly weakened by the fall in income in peripheral countries but if a recovery will take place they will soon reappear and will need to be financed in a context in which interbank unsecured funding is still very subdued.

The existence of official long term financing replaces and makes redundant the market for short term private financing and the rates quoted in this market, for example Eonia and Euribor rates, are therefore not very significant given the reduction in volumes. In this way the central bank avoids that the existing tensions in the market for financing to different countries banks emerge. Actually as the peripheral countries banks have in their balance sheet more loans than securities they appear to be favoured in the targeted loans program. This again may contribute to mask the still persistent discrimination among countries in the Eurozone without contributing in any way to the macroeconomic recovery. In turn this may resolve also the problem of the demand for reserves by peripheral countries banks due to the geographical patterns of the purchases under the purchase program.

In practice it means that the ECB continues to replace the market. The perspective of a return to the normal fades further away in time. The shape of the interbank financing in the future will be either central bank official financing at zero or negative rates or secured private financing at interest rates that are even more negative than Euribor and Eonia if the borrowers can provide the right collateral that is German Bunds.

While the negative rates in the preceding period 2011-2013 may have been used to revive the private unsecured interbank market it seems now with the new targeted long term refinancing that this aim has been for the moment abandoned and that the official refinancing at negative rates is the only option for those who do not have any high rated collateral to provide to lenders.
If the long term official financing were to stop then all the tensions in the private interbank market would re-emerge and the banks that could not provide highly rated collateral would be penalized.
If the unsecured interbank market were not to survive then even the old traditional monetary policy of targeting an interbank rate and trying to realize it by setting an official refinancing rate like the Main Refinancing Rate in the ECB institutional setting would be impossible to carry out.

Conclusions

The narrative surrounding the introduction of negative rates in the Eurozone points to their favourable effects on the so-called monetary policy transmission and in helping a portfolio rebalancing that would increase loans over other alternative assets in the banks' balance sheets.
In particular in the last year the efficacy of negative rates has been praised by leading institutional figures at the ECB because of the joint working of asset purchase program and negative rates. The portfolio rebalancing effects through which the asset purchase program would work would be enhanced by the negative rates. The latter would act to stimulate a particular rebalancing favouring loans over other assets and thus accelerating the recovery of the area after the crisis.
In this paper it has been argued that the negative rate policy that has begun in 2014 has to be inserted within the frame of a dysfunctional interbank market and had as main point that of restoring the pre-crisis lending behaviour of banks. In particular the banks that were more hit were the core countries banks that had withdrawn almost completely from lending to peripheral countries ones. It may seem that at that moment the central bank still thought that the interbank market could return to its former shape. Yet this has not occurred so far.

The last move by the central bank after the implementation of the asset purchase program was to introduce negative rates for reserves borrowing too but only if some conditions were fulfilled. This was included in the second version of targeted long term refinancing operations. Though the main point was that these refinancing operations were targeted the reserves borrowed through them do not have any restricted use. The only target precedes their demand; the banks that demand them are allowed to demand a quantity that is proportional to their existing stock of loans. In this phase, to paraphrase Lavoie's expression, the supply of reserves becomes a vertical line because of the asset purchase program. The banks that have more reserves than they demanded are compelled to redeposit them and the rate on deposits is negative. So they lose. However, if they fulfil the conditions for negative borrowing rates, this loss is avoided. In this last move by the ECB the aim of restoring a normal interbank market is given up completely and the punishment for banks that do not lend in the interbank market is replaced by a neutral result if they manage to lend to the private non-financial sector to a sufficient extent.

In this latter phase the mix of measures taken by the central bank consisting of asset purchase program, targeted long term refinancing operations, negative borrowing rates and forward guidance all point to the intention of replacing for the near future the interbank market altogether and therefore of not going back to the corridor system at all. It seems a sort of surrendering to the evidence that the normal functioning of the interbank market before the crisis cannot be restored and that many banks now lend to each other only through repo agreements with underlying assets as warranty. The central bank seems to be aware that unsecured lending between banks in the Eurozone is no more feasible and that not all banks have securities good enough to get favourable conditions in these transactions. Then the only solution is replacing the market with long term lending by the central bank at rates that are comparable to those charged for secured lending to those that can provide the best collateral. So in this new phase it seems that the long term refinancing operations are destined to last forever or at least for a long period of time as well as the very low or negative interest rates charged on borrowing reserves from the central bank.

Bibliography

Bindseil , U. (2004), *Monetary policy implementation. Theory, Past and Present*, Oxford University Press, Oxford.

Casiraghi M., E.Gaiotti, L.Rodano and A. Secchi, (2016) A "reverse Robin Hood"? The distributional implications of non-standard monetary policy for Italian households, Banca d'Italia Temi di discussione n.1077.

Cecchetti S.G., R.N. McCauley and P. M. McGuire, 2012, Interpreting TARGET2 Balances, BIS Working Papers No 393 Monetary and Economic Department December 2012.

Cour-Thimann, Philippine, (2013), CESifo Forum Special Issue April 2013: Target Balances and the Crisis in the Euro Area, CESifo Forum, issue , p. 05-50, http://EconPapers.repec.org/RePEc:ces:ifofor:v::y:2013:i::p:05-50 .

Febrero E., Uxo' J. and O. De Juan (2015) "The ECB during the Financial Crisis. Not so Unconventional! " *Metroeconomica* Volume 66, Issue 4 Pages 715–739.

Fulwiller S., 2009, Modern Central Bank Operations: The General Principles, in Basil Moore and Louis-Philippe Rochon (eds.), *Post-Keynesian Monetary Theory and Policy: Horizontalism and Structuralism Revisited*, Cheltenham: Edward Elgar Publishing.

Lavoie, M. (2010), Changes in Central Bank Procedures during the subprime crisis and their repercussions on monetary theory,, Levy Economics Institute of Bard College Working Paper n.606.

Constancio V. (2016) The challenge of low real interest rates for monetary policy , available at https://www.ecb.europa.eu/press/key/date/2016/html/sp160615.en.html accessed September 2017 .

Cœuré B. (2016) Assessing the implications of negative interest rates Speech by Benoît Cœuré, Member of the Executive Board of the ECB, at the Yale Financial Crisis Forum, Yale School of

Management, New Haven, 28 July 2016, available at https://www.ecb.europa.eu/press/key/date/2016/html/sp160728.en.html accessed September 2017.

ECB, Annual Report 2016, available at www.ecb.org.

ECB, 2013, Monthly Bulletin May, Monetary policy and Target imbalances available at https://www.ecb.europa.eu/pub/pdf/mobu/mb201305en.pdf .

ECB, LTROII, available at https://www.ecb.europa.eu/mopo/implement/omo/tltro/html/index.en.html.

ICMA European Repo and Collateral Council (ERCC), 2017, *European repo market survey*, June 7, 2017.

Minenna, M. (2016) *The incomplete currency* Chichester (UK): John Wiley&Sons.

Rochon, L.P. and S.Rossi (2007) "Central Banking and Post-Keynesian Economics," *Review of Political Economy*, Taylor & Francis Journals, vol. 19(4), pages 539-554.

Stiglitz, Joseph and Weiss, Andrew, (1981), Credit Rationing in Markets with Imperfect Information, *American Economic Review*, 71, issue 3, p. 393-410.

Tropeano, D, 2017, forthcoming, *Financial Regulation in the European Union after the Crisis* , London and New York, Routledge.

[i] After the long term refinancing has finally expired and it was returned back the ECB launched the quantitative easing program through which the national central banks purchased the government bonds of their own governments thereby buying them from the banks and paying them. Some banks bought the assets in anticipation of their rise in price thus pocketing a profit when selling it to the central bank. This is one of few sources of profit left since the interest margin is squeezed by the zero interest rate policy and the gains from swaps concerns only a few big institutions while the majority of players are still losing.