



DIRECTORATE GENERAL FOR INTERNAL POLICIES  
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

# Implications of the Low Interest Rate Environment for the Real Economy

NOTE

## Abstract

As nominal policy interest rates are hitting the lower zero bound in many industrialised countries, questions are raised about possible unintended consequences. This note argues that low interest rates reduce the long run rate of potential economic growth, but exiting “ultra-easy” policies now would be premature.

This document was requested by the European Parliament's Committee on Economic and Monetary Affairs.

## **AUTHOR**

Stefan COLLIGNON, Scuola Superiore Sant'Anna, Pisa and Centro Europa Ricerche (CER), Rome

With research assistance performed by Piero ESPOSITO

## **RESPONSIBLE ADMINISTRATOR**

Rudolf MAIER

Dario PATERNOSTER

Policy Department Economic and Scientific Policies

European Parliament

B-1047 Brussels

E-mail: [Poldep-Economy-Science@ep.europa.eu](mailto:Poldep-Economy-Science@ep.europa.eu)

## **LINGUISTIC VERSIONS**

Original: EN

## **ABOUT THE EDITOR**

To contact the Policy Department or to subscribe to its newsletter please write to:

[Poldep-Economy-Science@ep.europa.eu](mailto:Poldep-Economy-Science@ep.europa.eu)

Manuscript completed in February 2013.

Brussels, © European Union, 2013.

This document is available on the Internet at:

<http://www.europarl.europa.eu/studies>

## **DISCLAIMER**

The opinions expressed in this document are the sole responsibility of the author and do not necessarily represent the official position of the European Parliament.

Reproduction and translation for non-commercial purposes are authorised, provided the source is acknowledged and the publisher is given prior notice and sent a copy.

## **CONTENTS**

<b>EXECUTIVE SUMMARY</b>	<b>4</b>
<b>1. INTRODUCTION</b>	<b>5</b>
<b>2. THE RATIONAL OF LOW INTEREST RATE POLICIES</b>	<b>10</b>
2.1. Changes caused by the financial crisis	12
2.2. The impact of low interest rates on economic growth	13
2.3. Policy implications	17
<b>REFERENCES</b>	<b>18</b>

DRAFT

## EXECUTIVE SUMMARY

“Ultra-easy monetary policies” have been the immediate policy response to the Global Financial Crisis. They must be seen as the endpoint of a downward trend that has marked the last twenty years and which has been accentuated by the necessary policy responses to the current economic crisis. With interest rates close to the lower zero bound, the question is increasingly asked if this situation has unwarranted and unintended consequences.

International organisations have particularly focussed on negative effects for insurance and pension funds and the potential spillover for financial stability, but the implications for the real economy must also not be underestimated. This briefing note concentrates on the link between low interest rates and economic growth.

It first reviews the policy mechanism of lowering interest rates in “normal” circumstances and then discusses the implications of a liquidity trap.

However, an additional argument is made that low interest rates are reducing the equilibrium long run growth rate of the economy’s production potential. While the well-known Keynes-Ramsey rule states that in equilibrium the economic growth rate should be equal to the real interest rate, we reframe the argument for a monetary economy and for monetary policy. It is shown that the high liquidity preference in the present crisis is lowering the equilibrium growth rate.

However, because of the disequilibrium (“cyclical”) dynamics, a rapid return to higher interest rates is not defensible. Instead, fiscal policy should play a stronger role in the stabilisation of the Euro Area’s macroeconomy.

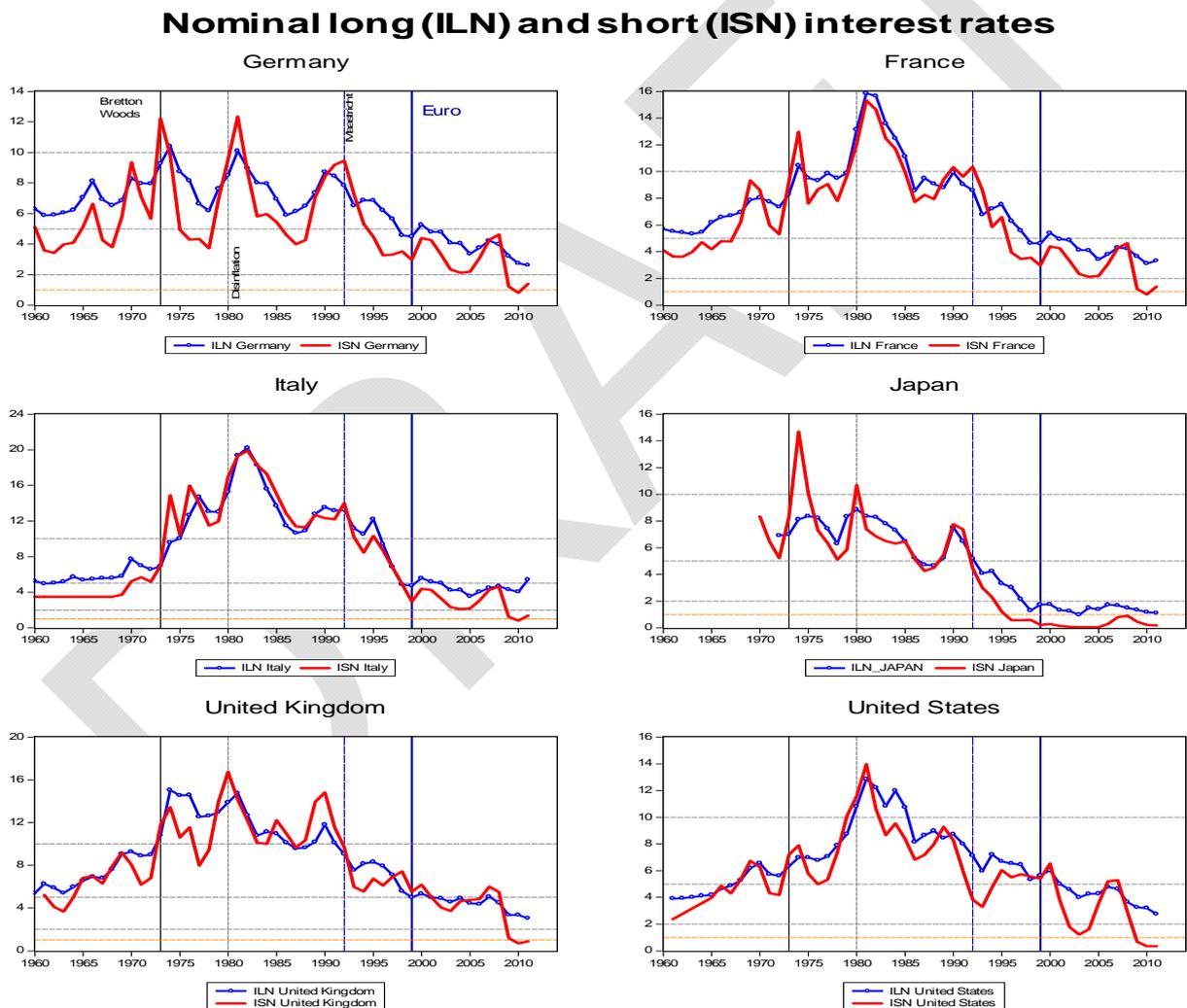
The policy implications are as follows:

- Significant impulses for growth coming from the ECB are no longer feasible. The bank must continue to reduce tensions in the financial markets by fulfilling its role as lender of last resort.
- In order to manage trust and confidence, it would also be of benefit if individual national central banks would stop questioning the collective actions of the Eurosystem.
- The proposition to raise the inflation target is tempting, but at least in the European context it would provide little improvement.
- It is too early to think of an exit from ultra-easy monetary policy. The short term priority must be to stimulate demand (money spending) in order to close the negative output gap.
- Fiscal policy should be used more aggressively to push Europe back into work by closing the output gap.
- Higher wages in northern surplus countries could also increase aggregate demand in the Euro Area.

# 1. INTRODUCTION

“Ultra-easy monetary policies” (White, 2012) have been the immediate policy response to the Global Financial Crisis. Most central banks have increased their balance sheets dramatically and lowered policy rates effectively to the zero lower bound (Collignon, 2012). However, the current low interest rate levels must also be viewed as “the endpoint of a downward trend that has marked the last twenty years and which has been accentuated by the necessary policy responses to the current economic crisis” (Danthine, 2012). Figure 1 gives a long-run perspective. An important reason for this long term trend was that after 20 years of disinflationary policy the inflation premium in long run interest rates has finally disappeared. This is, by the way, proof how difficult it is to eliminate inflation from expectations, once it has been engrained in the collective consciousness. Against this background, the Global Financial Crisis required drastic action and this has pushed nominal policy interest rates close to the lower zero bound.

Figure 1:



While few people doubt that these measures have prevented the financial crisis from turning into a deep 1930s-like depression,<sup>1</sup> there is an increasing awareness that these policies may also have unintended consequences if they are pursued for too long.

<sup>1</sup> For the underlying rationale see Bernanke (2012).

International organisations, such as IMF (2012), OECD (Antolin et al. 2011), Deutsche Bundesbank (2012) and BIS (2012), have particularly focussed on negative effects for insurance and pension funds and the potential spillover for financial stability, but the implications for the real economy must also not be underestimated. In this briefing note I will concentrate on the link between low interest rates and economic growth, because it is still little understood.

Yet, as the financial crisis has painfully taught us, the two aspects, namely financial stability and real economic developments, interact. For example, while it may be rational to ignore the emergence of asset bubbles in the short run, the accumulation of unsustainable financial and macroeconomic imbalances will ultimately end in a massive correction. Before the financial crisis, mainstream economic consensus seemed to believe that "it is better to pick up the pieces after a bust than to try to prevent the build-up of sometimes difficult-to-detect bubbles" (Blanchard et al. 2010: 8). In view of the economic and social damage caused by the crisis, such benign neglect is no longer tenable. The need to address risks to financial stability and combining monetary and regulatory tools is therefore an important lesson to be learned from the crisis.

Against this background, two separate arguments are challenging the dominant policy consensus that maintaining low interest rates and providing extraordinary liquidity support are necessary to ensure the proper functioning of credit markets. On the one hand, the massive creation of liquidity is feared to translate into higher inflation. On the other hand, low interest rates may lead to excessive leverage and risk taking by financial investors.

The inflation risk of easy money is regularly addressed by the German Bundesbank. For example its board member Andreas Dombret, responsible for financial stability, has said the European Central Bank's long term loans carry risks that might exacerbate the crisis:

*"Over the medium to long term, continued provision of ample liquidity might, through various channels, de-anchor inflation expectations, which would translate into higher inflation risks. It could also pave the way for new asset bubbles, thereby sowing the seeds of the next crisis."*<sup>2</sup>

With respect to the risks to financial stability, the recent IMF (2012:28) Global Stability Report states:

*"Low rates threaten financial stability if they are prolonged and are not accompanied by balance sheet repair and prudential oversight. In particular, maintaining low real risk-free yields at a time when some credit cycles are shifting into the expansion phase could set the stage for credit excesses while leaving balance sheets vulnerable to a downturn. Although recent economic fragilities may reduce the propensity to take risk, they are also likely to lead to a weakening in credit fundamentals. Finally, with bank balance sheets still in need of repair, low rates may divert credit creation into more opaque channels, such as the shadow banking system."*

An important problem in the wake of the financial crisis is that the collapse of asset prices has damaged balance sheets, so that banks and corporations need high returns to restore sound capital ratios. The experience of Japan with the collapsed asset bubble after 1991 has shown that the clean-up may take at least a decade (Koo, 2002). In this context:

*"The flow of capital away from the low interest rates in advanced economies and toward the brighter growth prospects elsewhere is intensifying the expansion of domestic liquidity, credit, balance sheet leverage, and asset prices in emerging*

---

<sup>2</sup> <http://www.bloomberg.com/news/2012-06-12/bundesbank-s-dombret-says-ecb-liquidity-provision-carries-risks.html>.

*market economies. Combined with stimulative domestic policies, these pressures raise the risk of overheating and a buildup of financial imbalances that could erode asset quality even if demand and credit conditions normalize". (IMF, 2012: 28).*

The Deutsche Bundesbank (2012) echoes this concern in its own Stability Report when it fears that a substantial worsening of the European sovereign debt crisis could have a "significant adverse impact on German banks and insurers. In addition, low interest rates, high liquidity and potential exaggerations in the German real estate market could pose a future threat to financial stability". Kablau and Wedow (2011) have identified these dangers in the insurance industry and summarise their findings:

*"A low interest rate environment can pose a key risk to the life insurance sector. A deteriorating return on investment holdings jeopardizes the guaranteed return on life insurance contracts. ... A low return on investment can lead to a depletion of the bonus and rebate provisions. As a result, life insurers' resilience may deteriorate."*

For White (2012:5) the consequences of the low interest rate environment does not only affect the financial sector:

*"Over time, easy monetary policies threaten the health of financial institutions and the functioning of financial markets, which are increasingly intertwined. This provides another negative feedback loop to threaten growth. Further, such policies threaten the 'independence' of central banks, and can encourage imprudent behavior on the part of governments. In effect, easy monetary policies can lead to moral hazard on a grand scale. Further, once on such a path, 'exit' becomes extremely difficult. Finally, easy monetary policy also has distributional effects, favoring debtors over creditors and the senior management of banks in particular. None of these 'unintended consequences' could be remotely described as desirable."*

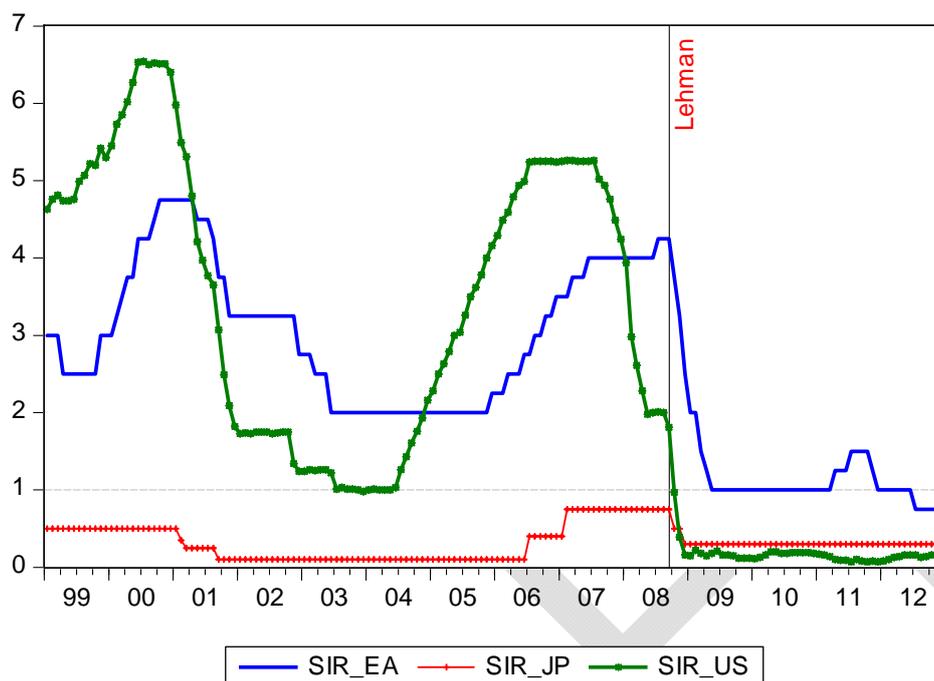
Despite these warning, all major central banks continue to pursue accommodating monetary policies. Why? One reason may be that there is no clear alternative. As Blanchard et al (2010:10) rightly point out:

*"Identifying the flaws of existing policy is (relatively) easy. Defining a new macroeconomic policy framework is much harder. ... It is important to start by stating the obvious, namely, that the baby should not be thrown out with the bathwater. Most of the elements of the precrisis consensus, including the major conclusions from macroeconomic theory, still hold. Among them, the ultimate targets remain output and inflation stability. The natural rate hypothesis holds, at least to a good enough approximation, and policymakers should not assume that there is a long-term trade-off between inflation and unemployment. Stable inflation must remain one of the major goals of monetary policy."*

At its Board Meeting on 20 December 2012, the ECB decided, in line with most other central banks, to keep its key interest rates unchanged at historically low levels close to the nominal zero bound (Figure 2). The American Federal Reserve Board had already decided a week earlier to condition the low interest rate level explicitly on the level of unemployment.

Figure 2:

## Monetary policy rates by major central banks



Source: Bloomberg.

The justifications for this policy vary according to the different statutory mandates of central banks. The ECB has the primary objective of preserving price stability and only subject to that must it support economic growth and financial stability. Consequently, ECB President Draghi has justified the decision to maintain policy rates near the lower zero bound by the fact that

*“HICP inflation rates have declined over recent months, as anticipated, and are expected to fall below 2% this year. Over the policy-relevant horizon, inflationary pressures should remain contained. The underlying pace of monetary expansion continues to be subdued. Inflation expectations for the euro area remain firmly anchored in line with our aim of maintaining inflation rates below, but close to, 2% over the medium term. The economic weakness in the euro area is expected to extend into 2013.”<sup>3</sup>*

On the other side of the Atlantic, and based on the devastating experience of the Great Depression, but probably also because the American social safety system is less developed than in Europe, the Federal Reserve System (Fed) is obliged to give a larger role to support full employment. On 12 December 2012 the Fed’s policy making body explicitly declared that:

*the exceptionally low levels for the federal funds rate are likely to be warranted “at least as long as the unemployment rate remains above 6½ percent, inflation over the period between one and two years ahead is projected to be no more than half a percentage point above the Committee’s 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored.” (Bernanke, 2012b: 3).*

Thus, despite different institutional arrangements, the monetary policies in the world’s two largest economies follow in reality very similar orientations.

<sup>3</sup> See: ECB, Introductory statement by Mario Draghi to the press conference, 10 January 2013; <http://www.ecb.int/press/pressconf/2013/html/is130110.en.html>.

Critics of “ultra-easy monetary policy” believe that the crisis has revealed a number of distortions and obstacles which make the conventional monetary policy consensus dysfunctional. In order to assess the reasonableness of this critique, it is necessary to first summarise the conventional arguments for low interest rates (I), then confront it with the changed reality following the financial crisis (II). I will then develop a simple argument for how low interest rates affect long term economic growth (III) and finally draw some policy conclusions (IV).

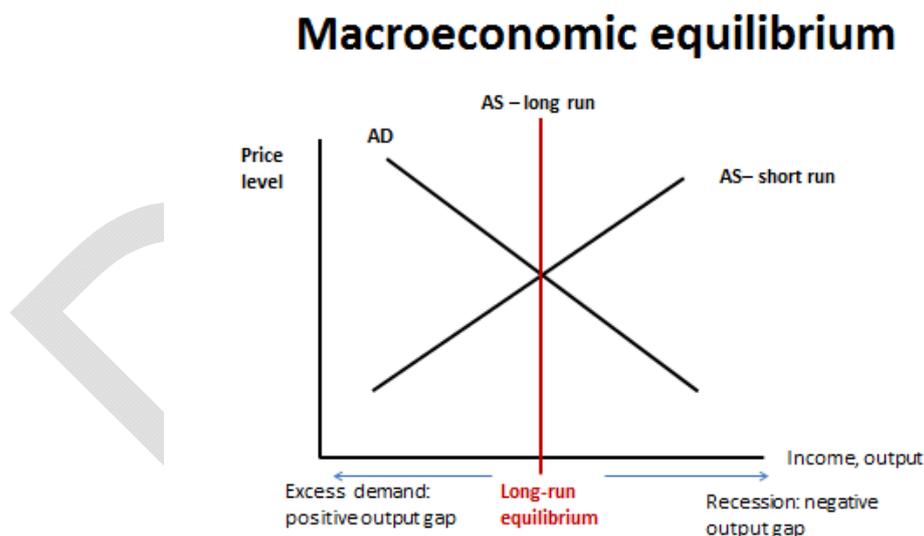
DRAFT

## 2. THE RATIONAL OF LOW INTEREST RATE POLICIES

At the core of modern monetary policy stands the principle that economic activity can be controlled by interest rates. This idea is well enshrined in the *Taylor Rule*, which guides the interest rate decisions of most central banks.<sup>4</sup> According to this rule, central banks react by changing interest rates with the purpose of minimising deviations from their inflation target and the output gap.

The underlying logic is described by standard economic text books of aggregate demand and supply.<sup>5</sup> Macroeconomic equilibrium is attained when aggregate demand (AD) equals aggregate supply (AS). The difference between aggregate demand and supply (AD-AS) is called the output gap. The aggregate demand curve shows the relationship between the price level and the quantity of goods and services *demanded*. Demand is effectively determined by how much money is spent on output. When the AD-curve is drawn for a given quantity of money supply, it is downward sloping, i.e. the higher the price level, the lower the output sold. The aggregate supply curve shows the relation between the price level and goods and services *supplied*. It is assumed that prices are flexible in the short run and sticky in the long run, so that the AS curve is vertical in the long run, but not in the short run. The long run output level depends on the amounts of available capital, labour and technology; it is also called the production potential. In the short run, however, when prices are sticky, firms are willing to sell more goods at higher prices and the short run AS-curve is upward sloping. Because output is produced by labour, this implies that higher demand will increase employment, but if it exceeds the production possibility potential, it will simply create inflation.

Figure 3:



The purpose of monetary policy is to set interest rates such that the output gap is zero and prices stable. The equilibrium interest rate, at which this is achieved, is sometimes called in reference to *Wicksell* (1898) the natural interest rate and the corresponding unemployment level the natural rate of unemployment. This theory assigns a significant role to monetary policy and the interest rate. In a simple quantity theory model, aggregate demand is equal to money supply and monetary policy seeks keeping it in line with the productive

<sup>4</sup> See Taylor 1993. For an evaluation of the Taylor Rule in the monetary policy of the ECB. See Collignon (2011).

<sup>5</sup> See for example Mankiw (2010).

capacities. Milton Friedman suggested a fixed growth rate of money supply in order to keep the economy stable. With some important modifications, this explanation is still inspiring the so-called monetary pillar in the ECB's analytic framework.

A more complex explanation is provided by the Keynesian IS-LM model, where IS stands for equilibrium in the goods market and LM for the equilibrium in the money market. Aggregate demand is decomposed into private and government consumption, investment and net exports (the demand for goods from abroad). These demand factors are sensitive to the interest rate, although at different degrees. Consumption mirrors savings decisions. If the interest rate is low, the preference for future consumption is reduced and present expenditure is increased. The same logic applies to investment. Net exports depend on exogenous demand in the rest of the world, but also on the exchange rate which responds to interest rates. In traditional textbooks, government spending is the least interest sensitive demand factor and this is why it can be used as an alternative policy tool when monetary policy loses its efficiency.

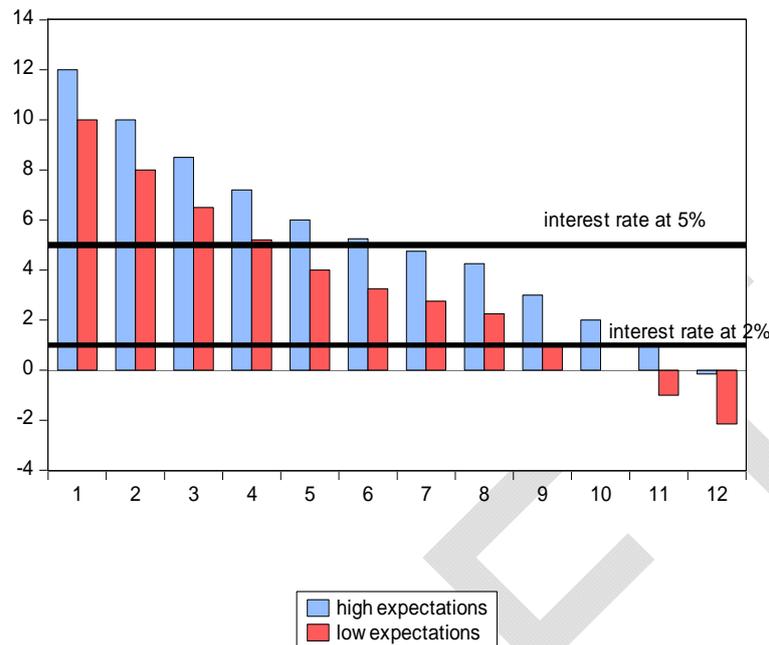
The LM-curve traces the relationship between the demand for real money balances and interest rate, given the exogenous money supply from the central bank. The interest rate reflects the opportunity cost of holding money, i.e. it is the price for giving up liquidity. Thus, at low interest rates, there is high demand for money balances, which translates into demand for goods, higher production and employment. Note that in this simplified model there is no role for buying assets other than goods. By simply increasing money supply ("printing money") the central bank can lower the interest rate and thereby stimulate the economy. Tightening money supply has the opposite effect.

Assuming that all assets are linked through arbitrage so that long-run rates were correctly reflecting future short rates and asset prices reflected the risk-adjusted present discounted values of future income streams, the central bank needs to only manipulate the short rate to change the finance conditions and incentives in the economy. This makes monetary policy potentially very powerful.

In Keynesian models an important impulse for aggregate demand comes from investment, which, through the multiplier process, generates income. Thus, if lower interest rates stimulate higher investment, this will generate a multiple income. Keynes modelled the interaction of investment with interest rates by the marginal efficiency of capital schedule. Imagine all possible investment projects can be ranked according to their rates of return, like in Figure 4. The interest rate is then the cut-off rate at which the cost of capital exceeds the return. For example in Figure 4 we see two environments, a boom with high expected returns, and a depressed period with low returns. At an interest rate of 5%, only six projects in good times and 4 projects in bad times will be realised. However, if the rate of interest is cut to 2%, nine projects will be undertaken in bad times and 11 in good times. These investment projects will then generate an increment of income, which is a multiple of the actual investment outlay. If the economy is in the position of a negative output gap, the additional income should help to bring the economy back to equilibrium.

Figure 4:

### Marginal efficiency of capital and interest rates



#### 2.1. Changes caused by the financial crisis

Although low interest rates are intended to stimulate investment and consumption, they hit a natural barrier: one cannot lower nominal rates below zero. The problem with very low nominal interest rates near zero is described by the liquidity trap. Krugman et al. (1998:141) have defined a liquidity trap “as a situation in which conventional monetary policies have become impotent, because nominal interest rates are at or near zero: injecting monetary base into the economy has no effect, because base and bonds are viewed by the private sector as perfect substitutes.” It occurs when risk-averse economic agents are hoarding cash because they expect adverse events such as financial instability and turmoil, deflation, deep recessions, unemployment and other catastrophes. In this case, expanding money supply by the central bank has little or no influence on the interest rate and does not stimulate the economy. As Keynes has first shown, this situation is likely to occur when asset prices are high and yields are low, which is, of course, the case during a financial bubble. Conventional monetary policy is then becoming powerless and other policy tools need to be used in order to stimulate demand. Credit-financed government spending is the most popular alternative.

However, in a climate of general economic uncertainty, the liquidity trap is not the only obstacle for monetary policy stimulating economic activity. As Figure 4 has shown, negative expectations about the future return on investment would reduce firms’ willingness to invest. The expectational dimension of future returns is highly dependent on psychological factors and the depth of the crisis. Keynes has emphasised that what matters for investment are the *expected* future returns, which *cannot be known with certainty*. In a deep crisis, the marginal efficiency of capital schedule is falling rapidly and if interest rates are already at the lower bound, it becomes difficult to stimulate investment. Tobin and Brainard (1977) have formulated an investment function, where a generalised risk premium reduces investment.<sup>6</sup> Thus, the higher the uncertainty, the greater the risk of potential

<sup>6</sup> The formula is:  $I = a + b[q - (1 + \rho)]$ , where  $I$  is net investment,  $a$  autonomous investment (e.g. by public authorities),  $q$  is “Tobin’s  $q$ ” which stands for the return on capital relative to risk-free financial investment and

losses and therefore the greater the “option value of waiting”, i.e. for not investing. In the conventional models, the Central bank must then lower interest rates in order to overcome the weakened demand. But when the interest rate is close to its zero bound, the negative effect of uncertainty cannot be compensated by lower interest rates. Monetary policy must then switch to other channels. It must reduce uncertainty in the macroeconomic environment. This is precisely what the ECB has done in recent years, most impressively when President Mario Draghi declared in London last year that the ECB would “do whatever it takes to save the euro” (Collignon, 2012).

The here described models are the standard workhorses of economic theory. Their focus is on single period analysis, even if the adjustment path from some imbalances may take some time. The purpose of policy is to close the output gap in order to ensure price stability and high employment. However, this perspective ignores the consequences of short-run demand dynamics on the long-run growth of supply. The productive potential or the natural rate of unemployment is taken as exogenously determined by structural factors in the labour market. Hence, monetary policy must minimise deviations from the natural rate, but shifts in the position of the natural rate can only be achieved by structural reforms in the labour market. However, this explanation has two handicaps: first, it ignores the endogenous shifts in the growth potential, which are caused by the crisis. Second, structural reforms, especially of the labour market are equally exogenous. They reflect political preferences and compromises rather than economic adjustment mechanisms. Thus, we witness that political discourses informed by these theories are exhorting reform – and achieve very little. I believe this *reform failure* is less a consequence of lack of will or insufficient implementation, but essentially a result of theories which do not take into account the endogenous dynamics of economic processes. One example is the impact low interest rates will have on long term growth.

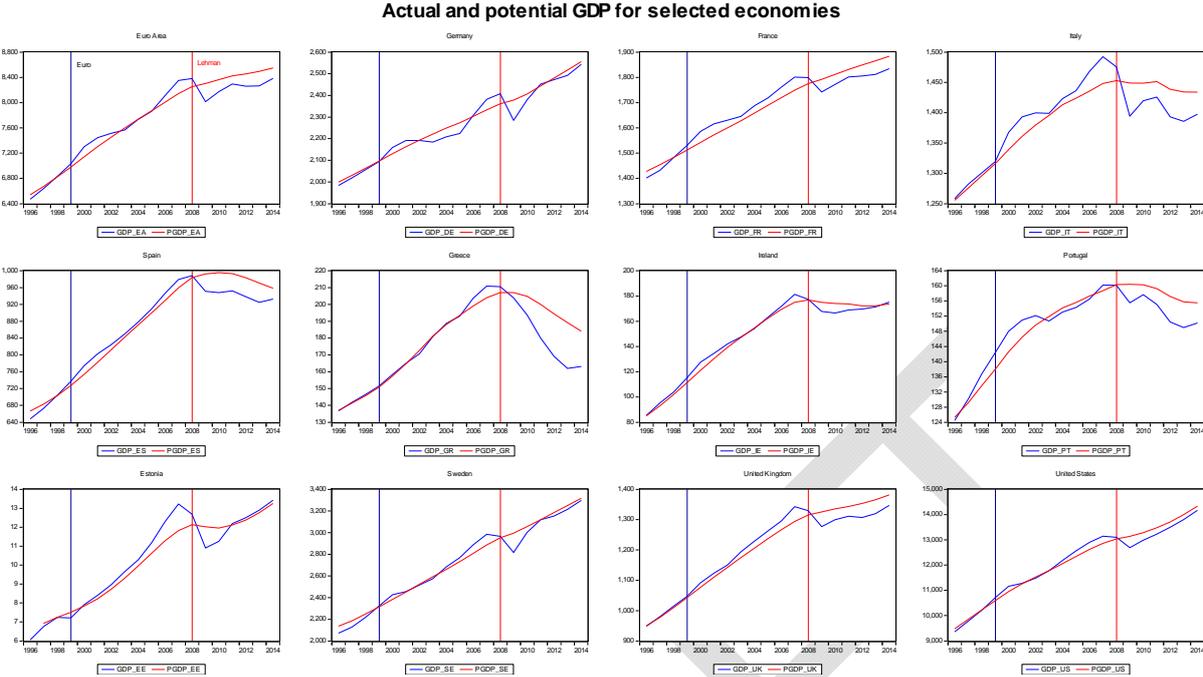
## 2.2. The impact of low interest rates on economic growth

One of the most intriguing features of the recent crisis is the slowdown of potential economic growth in the crisis countries. Figure 5 shows actual and potential GDP for some selected economies. The deep output losses caused by the crisis are frightening and only few countries have returned to their earlier potential levels. Especially in the southern crisis member states the lack of demand has pulled down not only the actual but also the potential growth rate. Collignon (2013) presents econometric evidence that this *reduction of potential growth* is a *response to weak aggregate demand* largely because of insufficient investment. From the point of standard economic theory discussed above, economic policy should therefore stimulate demand. However, given the persistence of the crisis, it is clear that the ultra-easy monetary policy does not do the trick, while fiscal austerity prevents governments from acting as a macroeconomic stabiliser. Thus, more attention should be given to effective aggregate demand management in the Euro Area. This is essentially a short run agenda. I will not pursue the demand side argument further in this section of the note, but rather turn to the correlation of potential growth with low interest rates.

---

$\rho$  is the risk premium. It is clear that in the crisis,  $q$  will fall and  $\rho$  will rise, so that investment is squeezed from both sides.

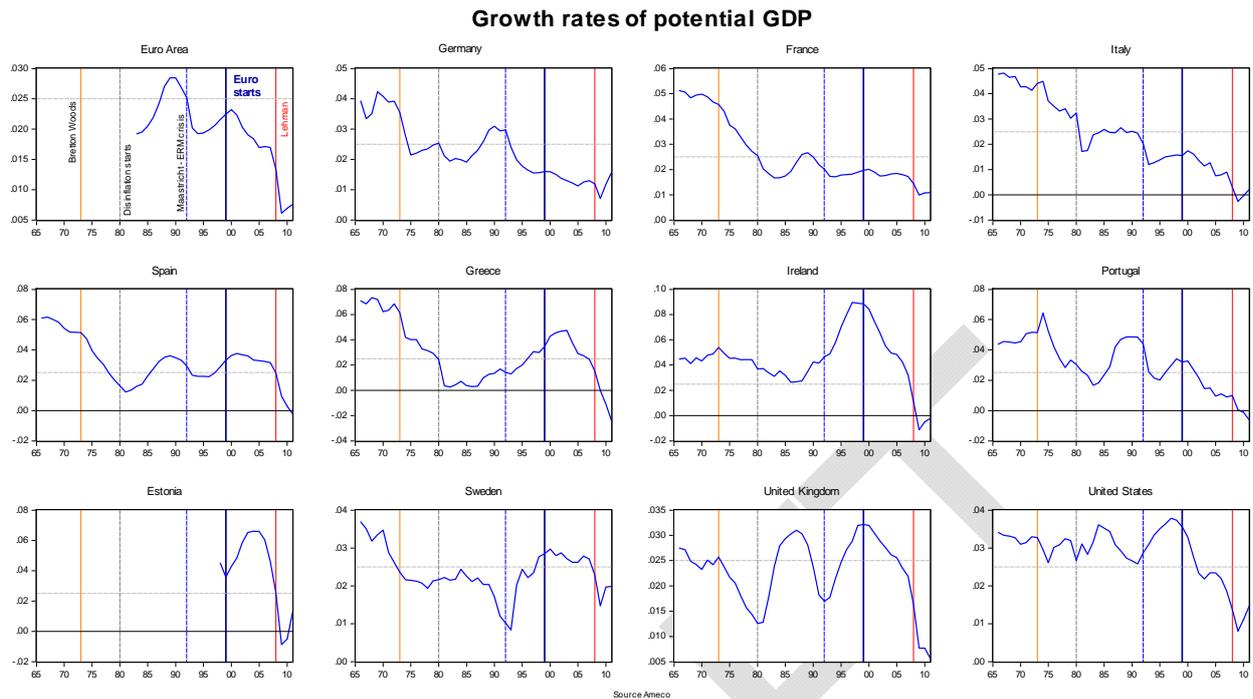
Figure 5:



Source: AMECO.

To start, Figure 6 shows the growth rates of the economic potential over half a century. We observe a long-run trend for the potential growth rate to slow down, although this trend is interrupted by specific events. First, potential growth was negatively affected by the collapse of the Bretton Woods System, although the impact was much stronger in multi-currency Europe than in the single-currency USA. Second, we note contradictory responses to the global anti-inflationary monetary tightening which kept real interest rates high from 1980 (Volker shock) until the mid-1990s. In most countries the immediate response to tight money was a reduction in potential growth, which is in line with standard demand theory, but then potential growth improved soon after. The late 1980s boom was interrupted by the European Exchange Rate Mechanism (ERM) crisis that followed German unification in 1992-3, just after the signing of the Maastricht Treaty. In member states which devalued against the Deutschmark (Italy, UK, Ireland, Spain, Portugal), the slowdown was less marked than in northern Europe. In the mid-1990s, interest rates started to come down in the global economy and also in Europe. This fall has stimulated growth in the US and southern European member states, but it had little effect in Germany and central Europe where the rate cuts were less pronounced. From the start of European Monetary Union in 1999 on, nearly all member states saw their potential growth rates fall despite historically low interest rates. Because supply and demand factors overlap, it is difficult to identify the long run effect of low interest rates on economic growth from these data. However, we can use a simple theoretical model to draw some conclusions.

Figure 6:



### A Keynesian-monetarist model for determining equilibrium growth

An important theoretical benchmark in growth economics is the Ramsey/Cass-Koopmans (RCK) Model, which derives the so-called *Keynes-Ramsey modified golden rule* whereby the real interest rate is determined by the rate of time preference plus population growth. Thus, tastes and population growth determine the real interest rate and technology determines the optimal capital stock and level of output and consumption that is consistent with this rate (See Blanchard and Fischer, 1989: 45). One of the beauties of the model is that the economy adjusts to the interest rate and not the other way round. However, this model has no role for money and monetary policy, because the rate of time preference is derived from consumer tastes for present versus future consumption and not from policy choices. I will now show that the same result can be obtained in an extremely simplified Keynesian-monetarist model.

We start by using the quantity equation in an economy with zero population growth:

$$(1) PY = MV$$

where P stands for the level of goods prices, Y for output, M for money supply and V the velocity of circulation, assumed constant for technical reasons. Next, we assume with standard monetary theory (Bofinger, 2001) that all money is credit. Because credit requires repayment of principal plus interest, the liability of the borrower at the end of period (t) is

$$(2) M_t - Cr_t - Cr_{t-1}(1+i) - M_{t-1}(1+i)$$

Where  $Cr$  stands for credit and  $i$  for the nominal interest rate. Putting (2) into (1) and indexing yields

$$(3) P_t Y_t = M_{t-1}(1+i)$$

Taking logs and differencing, we get the growth rates

$$(4) \Delta p + \Delta y = \log(1+i) \approx i$$

In equilibrium, the nominal growth rate of GDP equals the nominal interest rate or by rearranging we obtain that *the economy must grow at the rate of the real interest rate.*<sup>7</sup>

$$(5) \Delta y = i - \Delta p$$

The implication is that in equilibrium, a low interest rate implies low growth of the productive potential, while at high rates economic agents must generate more income to service their debt.

This model is unrealistically simplified as it does not distinguish between credit given by the central bank and credit given by banks to the real economy. We therefore now assume that all credit granted by commercial banks is broad money (M3) and carries the interest rate  $i$ . Banks hold reserves  $MB$  at the central bank for which they must pay the policy rate  $b$  and they only provide new credit if they make profit. Hence, the increase in credit and broad money supply is a function of the net profitability of a bank's credit portfolio:  $\text{net profits} = Cr(1 + i) - MB(1 + b)$ . The banks' net profits can also be expressed as the rate of return on bank's assets, so that new credit and broad money creation are determined by:

$$(6) \Delta M3 = f[1 + i - 1/m - b/m]$$

In this equation  $m$  stands for the multiplier  $m = \frac{M3}{MB}$ . With rising uncertainty in an economic crisis liquidity preference increases and banks hold a larger share of their assets in liquid central bank reserves. Hence, the money multiplier  $m$  drops, but this also reduces the profitability of banks. Hence banks respond by reducing bank lending and the broad money aggregate shrinks. Aggregate demand falls and a recession occurs. Now, in normal circumstances, the central bank would lower the policy rate  $b$  commensurate to compensate for the fall in  $m$  in order to prevent a recession. However, with the policy rate  $b$  already close to zero, the economy is in the liquidity trap. Conventional monetary policy is no longer possible. Without effective monetary policy action, two things will happen:

- The non-compensated increase in liquidity preference undermines the balance sheets and lending propensity of commercial banks because it lowers the banks' profitability. Thus, a credit crunch occurs.
- Yet, for the economy as a whole, the lower profitability of the banking system translates into a reduced burden of debt service, which therefore requires less additional income to service the debt. Hence, the equilibrium growth rate will be reduced, but this will also close the output gap from above. The final outcome will be a lower steady state growth path with higher structural unemployment.

As these two trends interact, the real economy will first fall into a recession (negative output gap), while simultaneously the equilibrium rate of growth will slow down. This is precisely what we witnessed in many Euro Area member states (Figure 5). Thus our model provides an explanation for the short and long run consequences of the financial crisis and the difficulties monetary policy is confronting in bringing the economy back to normal.

This impairment of economic growth is also important for public debt. If monetary policy has become powerless, fiscal policy must generate the aggregate demand necessary to pull the economy out of the crisis. However, governments' capacities to borrow are constrained by the question of debt sustainability. In Collignon (2012b), I have shown that the Euro Area's fiscal policy rules are necessary and sufficient to ensure debt sustainability, although they could be used more generously. The fundamental rule for long-run debt stability is that the consolidation effort in terms of primary surplus increases must be larger than the growth-adjusted real interest rate. As long as this condition is fulfilled, and assuming no

<sup>7</sup> In essence, this is the same as the Keynes-Ramsey modified Golden Rule

debt criterion in the excessive deficit procedure, the steady-state debt-GDP ratio will vary with the nominal growth rate. Hence, a permanently lower equilibrium growth rate, say between 1-2 percent would push the long run debt ratio to 75-100%. However, for some member states convergence to this steady state will take a long time and there is a real risk that while on the adjustment path individual member states could hit Irving Fisher's (1933) over-indebtedness trigger point. The problem is that raising interest rates would not necessarily help to improve the situation, as the growth-adjusted interest rate would push up the consolidation threshold. Europe is therefore in a very uncomfortable position: in the long run, the low interest rates undermine growth and increase the debt burden. In the short run, conventional monetary policy has become powerless, so that little stimulus is to be expected from this side. But for a massive fiscal stimulus, at the example of Japan or at least the USA, the margins of manoeuvre are severely constrained, given the debt crisis and communication blunders by European governments over the last few years.

### 2.3. Policy implications

So, what is to be done? One implication from the logic of this note is that one can no longer hope for significant impulses for growth coming from the ECB. The best the bank can do is to continue reducing tensions in the financial markets by fulfilling its role as lender of last resort. In order to manage trust and confidence, it would also be of benefit if individual national central banks would stop questioning the collective actions of the Eurosystem.

In this context, the proposition made by the IMF (Blanchard et al. 2010) to raise the inflation target is tempting, but at least in the European context it would provide little improvement. Credibility as the only coherently functioning institution in the European Union is the strongest asset the ECB has. Putting this in question would quickly destroy the euro. As Peter Praet (2013) has pointed out, positive real interest rates are a functional and not a tactical criterion of European monetary union.

Most importantly, however, it is too early to think of an exit from ultra-easy monetary policy. While it is true that the low interest rates increase the risks for financial stability and lower the long run potential for economic growth, the short term priority must be to stimulate demand (money spending) in order to close the negative output gap. In other words, before dealing with the long-run equilibrium conditions, fixing the crisis has priority.

Fiscal policy should be used more aggressively to push Europe back into work by closing the output gap. Only after this task has been accomplished can one consider slowly raising interest rate.

If monetary and fiscal policy cannot be used efficiently, income policy must play a role. Higher wages in northern surplus countries could increase aggregate demand in the Euro Area.

## REFERENCES

- Antolín, P., S. Schich, J. Yermo. 2011. *The Economic Impact of Protracted Low Interest Rates on Pension Funds and Insurance Companies*; OECD Journal: Financial Market Trends, vol. 2011.1.
- Bernanke, B. 2012. *Monetary Policy since the Onset of the Crisis*. Remarks by Ben S. Bernanke Chairman Board of Governors of the Federal Reserve System at the Federal Reserve Bank of Kansas City Economic Symposium Jackson Hole, Wyoming August 31, 2012 <http://www.federalreserve.gov/newsevents/speech/bernanke20120831a.htm>.
- Bernanke, B. 2012b. Transcript of Chairman Bernanke's Press Conference, 12 December 2012: <http://www.federalreserve.gov/mediacenter/files/FOMCpresconf20121212.pdf>.
- BIS, 2012. *Quarterly Review* September, International banking and financial market developments.
- Blanchard, O., G. Dell'Ariccia, and P. Mauro. 2010. *Rethinking Macroeconomic Policy*. IMF Staff Position Note SPN/10/03; February 12, 2010.
- Blanchard, O. and S. Fischer, 1989. *Lectures on Macroeconomics*; MIT Press
- Bofinger, P. 2001. *Monetary Policy. Goals, Institutions, Strategies and Instruments*. Oxford University Press.
- Collignon, S. 2011. *European Monetary Policy under Jean Claude Trichet*. European Parliament, IP/A/ECON/NT/2011-03 September 2011.
- Collignon, S. 2012. *ECB Interventions, OMT and the Bankruptcy of the No-Bailout Principle*; European Parliament, IP/A/ECON/NT/2012-05 September 2012.
- Collignon, S. 2012b. Fiscal Policy Rules and the Sustainability of Public Debt in Europe; *International Economic Review*, Vol. 53, No. 2, May 2012.
- Collignon, S. 2013. *Economic Growth versus Austerity*; European Parliament, IP/A/ECON/NT/2013-05 January 2013.
- Danthine, J.-P. 2012. *A world of low interest rates*. Speech by Mr Jean-Pierre Danthine, Member of the Governing Board of the Swiss National Bank, at the Money Market Event, Zurich, 22 March 2012.
- Deutsche Bundesbank, 2012. *Financial Stability Review*; Press notice 2012-11-14 [http://www.bundesbank.de/Redaktion/EN/Pressemitteilungen/BBK/2012/2012\\_11\\_14\\_financial\\_stability\\_review.html](http://www.bundesbank.de/Redaktion/EN/Pressemitteilungen/BBK/2012/2012_11_14_financial_stability_review.html).
- Fisher, I. 1933. The Debt-Deflation Theory of Great Depressions; *Econometrica*, vol. 1(4): 337-357.
- IMF, 2012. Global Financial Stability Report, *Restoring Confidence and Progressing on Reforms*, October; <http://www.imf.org/External/Pubs/FT/GFSR/2012/02/pdf/text.pdf>.
- Kablau, A. and M. Wedow. 2011. *Gauging the impact of a low-interest rate environment on German life insurers*. Deutsche Bundesbank Discussion Paper Series 2: Banking and Financial Studies No 02/2011.
- Koo, R. 2002. *The Holy Grail of Macroeconomics. Lesson's from Japan's Great Recession*. Wiley and sons, Singapore.
- Krugman, P., K. M. Dominquez, K. Rogoff 1998. It's Baaack: Japan's Slump and the Return of the Liquidity Trap; *Brookings Papers on Economic Activity*, Vol. 1998. 2: 137-205.
- Mankiw, N. G. *Macroeconomics*, 7th Edition. Worth Publishers; 2010.
- Praet, P. 2013. Member of the Executive Board of ECB, Speech at the "Annual Danish Top Executive Summit 2013", Copenhagen, 29 January 2013 <http://www.ecb.europa.eu/press/key/date/2013/html/sp130129.en.html#>.
- Taylor, J. B. 1993. Discretion Versus Policy Rules in Practice; *Carnegie-Rochester Conference Series on Public Policy*, 39:195-214.

- Tobin, J. and W. Brainard. 1977. *Asset markets and the Cost of Capital*; in: J. Tobin (1982) *Essays in Economics, Theory and Policy* 3. MIT Press.
- White, W.R. 2012. *Ultra Easy Monetary Policy and the Law of Unintended Consequences*; Federal Reserve Bank of Dallas, Globalization and Monetary Policy Institute, Working Paper 126, September.
- Wicksell, K. 1898. *The Influence of the Rate of Interest on Commodity Prices*; reprinted in Erik Lindahl, ed., *Selected Papers on Economic Theory by Knut Wicksell* (1958: 67-92).

DRAFT