SOME REFLECTIONS ON THE LIQUIDITY TRAP AND THE CONDUCT OF MONETARY POLICY UNDER LOW INFLATION*

*Isabel Marques Gameiro***

*Maximiano Pinheiro***

1. INTRODUCTION

In the public debate over economic perspectives in the euro area, the risk of being close to a so-called "liquidity trap" has been frequently mentioned[1]. The underlying idea is that, in a context of low inflation and low nominal interest rates, monetary authorities have little room to carry out further cuts to interest rates to counteract unfavourable shocks to the economy (since nominal interest rates cannot fall below zero). In this situation, monetary policy loses its capacity to influence the economy through the interest rate channel. This situation rises immediately the question of whether it is desirable that monetary policy counteracts those shocks — that is, if monetary policy should adopt a counter-cyclical posture.

Regardless of whether a counter-cyclical policy is desirable or not, economic literature is fairly consensual in pointing that monetary shocks should be counteracted (setting aside eventual problems of identification of the origin of the shock). The most cited empirical cases of liquidity traps (the great depression in the USA and the recent Japanese economic situation) provide examples of shocks originated in the monetary sphere,

as they were related to a collapse in asset prices and to a banking crisis. Therefore, we are in the presence of cases where the interest rate channel is not the most relevant one, neither does it act as the active constraint.

Meanwhile, it is currently consensual that the interest rate channel is not the only existing one; indeed, at least two other channels are accepted — the assets price effects and the credit channel. In this context, the debate around the effectiveness of monetary policy in a situation of very low interest rates is reduced to the debate around the empirical relevance of these channels. In any case, in the context of the recognition of these channels (independently of their empirical significance), it seems difficult to argue that monetary policy is fully inoperative in a context of null or virtually null interest rates.

Finally, in spite of the existence of alternative channels there is the question of whether there are costs associated with the non-operation of the interest rate channel. Some empirical research tries to measure the costs of the reduction in effectiveness of monetary policy in the presence of a liquidity trap. However, the results of these studies are subject to the Lucas critique, since they build upon data from a non-zero inflation regime, and hence do not incorporate the adjustment of the agents' behaviour to the change in regime. On the contrary, several contexts exist (namely when considering optimal taxation principles) where the optimal result points towards null or virtually null interest rates (i.e., the Friedman rule).

These issues are further developed in the following sections. Section 2 revisits the liquidity trap concept, and explores the reasons why this might be a current issue in Europe. Section 3 discusses the desirability of a counter-cyclical monetary policy, while situations of simultaneity between a liquidity trap and a banking crisis are analysed in Section 4. Section 5 discusses alternative channels of transmission of monetary policy, which are not directly related with the interest rate. Some consideration around the existence or not of transitory and/or permanent costs due to the non-operation of the interest rate channel in a regime of price stability are presented in Sechion 6. Finally, in the light of the previous reflections, section 7 draws some conclusions regarding the current situation of the euro area.

2. THE LIQUIDITY TRAP AND THE CURRENT ECONOMIC SITUATION IN EUROPE

To simplify the presentation without losing generality, consider a closed economy where beyond money (strictly defined as circulation plus demand deposits) exists solely one financial asset, that yield a nominal return at the rate of interest i; under these circumstances, interest rate i cannot be negative: no one would choose to hold an asset with a negative nominal return. In practise (admitting economic agents are risk-averse), the lower admissible boundary for the interest rate (this limit being denoted by i) is marginally positive, due to considerations of liquidity and /or risk.

If the nominal interest rate becomes close enough to lower boundary i, economic agents become virtually indifferent between holding money and holding the financial asset. Any additional amount of money injected in the economy by the monetary authority will render a relatively small effect on the demanded amount of the financial asset, hence the interest rate is not affected significantly. In other words, in the context of very low interest rate levels, money demand will tend to be perfectly elastic vis-à-vis the interest rate, and therefore any money injection will result chiefly in a reduction of money circulation velocity (defined as the ratio between nominal output and the money stock of the economy).

This situation, where no manoeuvre room is left to reduce the interest rate any further — implying the incapability of the monetary policy interest rate channel to counteract (or accommodate) eventual unfavourable shocks over the economy, is what Keynes referred to as the "liquidity trap".

The term "liquidity trap" is often related to the so-called deflationary spiral. The underlying idea is that, if the economy is caught in a liquidity trap and if an unfavourable shock to the economy leads to recession and deflation, the real interest rate will rise, yielding additional recessive and deflationary effects on the economy. These effects are widened if there is rigidity towards reductions of nominal wages. In this case, deflation also results in the rise of real wages, contributing to the further aggravation of recession.

In the public discussion around economic perspectives in the euro area, the risk of becoming closer to a liquidity trap situation has been referred frequently. Currently the euro area exhibits:

— low inflation (virtually null when adjusted for the bias in the consumer price index[2]. In March, the HICP in the euro area grew 1.0 per cent in year-on-year terms, and 1.0 per cent in annual average terms;

— relatively low nominal interest rates. Following to the decision of 8 April, the rate of the main refinancing operations of the ECB (the repo rate) was cut to 2.5 per cent, and the interest rates on the deposit facility and the marginal lending facility were cut respectively to 1.5 and 3.5 per cent. The 3-month Euribor rate fell to 2.6 per cent in mid-April;

— high growth rates of aggregate M1, significantly above those of broader aggregates. In March, aggregate M1 grew 10.8 per cent in year-on-year terms, while aggregate M3 grew 5.1 per cent.

In this context, some argue that the ECB room of manoeuvre to carry out further cuts to the intervention interest rates is quite narrow. These cuts

---

(2) For the USA, the commission headed by Michael Boskin concluded that the CPI overestimates inflation on average by 1.1 p.p. every year. In a similar exercise, the Bundesbank concluded that the bias of the CPI in Germany averages 0.75 p.p. every year.

would be seen as desirable if unfavourable shocks to the European economy took place, for instance:

— a sudden and significant fall in external demand (resulting inter alia from hard-landing of the USA economy); and/or
— a strong depreciation of the USD vis-à-vis the euro; and/or
— a stock market crash in Europe and in the USA (eventually due to the bursting of a speculative bubble).

3. DESIRABILITY OF A COUNTER-CYCLICAL MONETARY POLICY

The previous section raised doubts about the general effectiveness of monetary policy to respond to unfavourable shocks to the economy in a context of very low interest rates. Before further discussing effectiveness, it is convenient to ascertain if monetary policy should exhibit a counter-cyclical posture.

Nowadays, it is commonly accepted that the monetary authority should use at each period t its instruments to minimise a loss function of the following type[3]:

$$L_t = \left(p_t - p^*\right)^2 + \lambda\left(y_t - y_t^n\right)^2 + \beta\left(i_i - i_{t-1}\right)^2$$

where p_t is the inflation rate forecast for a given horizon (one to two years), p^* is the inflation rate objective pursued by monetary authorities, y_t stands for the observed real output, y_t^n is natural or potential output of the economy, y_t^n is the short-term interest rate, λ is the (non-negative) relative weight monetary authorities attribute to the stabilisation of the output gap $\left(y_t - y_t^n\right)$ and β is the (non-negative) relative weight authorities ascribe to short-term interest rate stabilisation.

Although most economists subscribe the loss function above, they diverge widely in what concerns the levels or weights and the concept of potential output considered.

Regarding weights, the case where $\lambda=\beta=0$ corresponds to a strict inflation objective, while case where $\lambda > 0$ and/or $\beta > 0$ represent situations where the monetary authority bears concerns with

the stabilisation of the output gap and/or the short-term interest rate.

As regards potential output and the output gap, three distinct concepts can be referred to, with distinct implications on the guidance of monetary policy. The most traditional concept views potential output simply as the trend of the observed output time series[4]. In this case, if $\lambda > 0$, monetary authorities must counteract all shocks to the economy, to stabilise the output growth rate towards its recent average level.

A second concept of potential output lies upon the distinction made between different kinds of shocks to the economy[5]:

— "aggregate demand shocks", defined as those yielding no lasting effects on output, rendering only cyclical fluctuation;
— "aggregate supply shocks", defined as those yielding a lasting effect on output - for instance, productivity/technology shocks and shocks on the international prices of commodities.

According to this perspective, potential output should be understood as the outcome of the accumulation of supply shocks (and not as a mere algebraic trend). Therefore, monetary policy should only attempt to counteract observed output volatility when it results from shocks rendering a temporary effect (i.e., aggregate demand shocks). However, a counter-cyclical monetary policy like this must bear in mind that:

— it appears to be quite difficult to recognise the nature of shocks to the economy, especially with due timeliness;
— lags associated to the guidance of monetary policy are relatively lengthy and variable.

In this context, the counter-cyclical posture of monetary policy should be assumed with modera-

_____

(3) See for instance Svensson (1999).

_____

(4) This is the underlying concept when potential output is calculated using linear trends or time filters, like the Hodrick-Prescott filter.

(5) For example, underlying monetary policy guidance by the Swedish central bank, in the context of the inflation target strategy, is a potential output concept of this type (see Sveriges Riskbank - Memorandum 1999.02.04).

tion, so it does not render effects opposite to the expected ones — i.e., so it does not widen, instead of narrowing, cyclical fluctuations of output and inflation.

Finally, the potential output concept present in Real-Business Cycle models is broader. These models identify real shocks and monetary shocks, the latter (basically shocks in money circulation velocity) being the only ones rendering potential output unaffected. Other kinds of shocks affect simultaneously potential and effective output. In this perspective, monetary policy must be neutral in relation to all non-monetary shocks. This neutrality does not mean that monetary policy is left with no manoeuvre room. If frictions exist (e.g., monopolistic competition and price rigidity, under multi-period contracts), monetary policy should act so that the economy emulates the "ideal" behaviour that would be recorded if no frictions were present. Admitting stable inflation, nominal interest rates may, for instance, reproduce the equilibrium adjustment behaviour of the interest rate. Examples of policy response vis-à-vis shocks to the economy idealised by this current are presented in Appendix.

Therefore, we conclude that the issue of the monetary policy posture towards shocks to the economy is far from consensual; furthermore we conclude that the relevance of the Keynesian "liquidity trap" problem is greater the less moderate is the counter-cyclical posture defended for monetary policy.

4. LIQUIDITY TRAP AND BANKING CRISIS

The most cited examples of liquidity trap situations (the great depression in the USA and the recent economic situation in Japan) were linked to a collapse of asset prices and to a banking crisis. In these cases, the interest rate channel is not the most relevant one, neither it is the active constraint. From what follows from the previous section, it is fairly consensual that the monetary authority should counteract monetary shocks, acting as lender of last resort if necessary.

Recall that this was not the policy pursued in the USA during the great depression in the 1930s; in fact, this period saw a contraction of the nominal stock of money[6]. Although prices fell 24 per cent between 1929 and 1933, the reduction of the nominal stock of money determined the maintenance of the real stock, eliminating one of the mechanisms that could have led to the recovery of the USA economy. The fall in the nominal stock of money did not result from a reduction of the monetary basis (H) (which rose from USD 7.1 billion in 1929 to USD 19.4 billion in 1933). Instead, it resulted from a reduction of the money multiplier (M1 / H) (from 3.1 in 1929 to 2.4 in 1933) due to the insolvency of more than 4,000 banks out of 20,000 existing in 1929. Indeed, the fact that the Federal Reserve Bank maintained a restrictive posture regarding banks' access to primary liquidity throughout this period magnified the effects of the burst of a speculative bubble on the banking system - hence determining the insolvency of a significant number of banks. In this context, monetary authorities in the USA have frequently been held responsible for the deepening of the depression.

However, the moral hazard problems associated to the existence of an entity acting as lender of last resort cannot be disregarded. In the absence of appropriate supervision, if the banking system foresees a bail-out from monetary authorities, institutions will tend to assume excessive risk, worsening their financial vulnerability.

5. ALTERNATIVE CHANNELS OF TRANSMITION OF MONETARY POLICY

The relevance of the liquidity trap depends crucially on the importance attributed to the interest rate channel in the monetary policy transmission mechanisms. The interest rate channel is usually motivated with the conventional Keynesian IS/LM model: the central bank determines short-term interest rates (through its intervention rates), which in turn affect long-term rates; these influence companies' investment decisions, as well as households' (durable good) consumption ones. Therefore, for the liquidity trap to constitute a problem to the management of monetary policy, it is required that short-term interest rates provide the dominant channel through which monetary decisions are transmitted to the economy.

---

(6) See for instance White (1990).

It is consensual nowadays that the interest rate channel is not the only existing one; the following complementary channels — the so-called direct channels — are often pinpointed:

— the relative asset prices channel (including the exchange rate);
— the credit channel.

The first channel recognises that central banks influence the structure of portfolios and/or asset prices, generating this way temporary effects on the demand for goods and services. A monetary shock[7] disturbs the equilibrium structure of economic agents' asset portfolios; it also induces changes in the demand for real assets and hence rendering changes to their relative prices. In addition, if the central bank induces an expansion of the monetary base through the purchase of foreign currency, the national currency depreciates, which in turn stimulates the demand for domestically-produced tradable goods and services. Note, however, that the devaluation may render perverse effects if domestic economic agents are highly indebted in foreign currency.

Meanwhile, regardless of the way liquidity injection is carried out, agents' expectations about future inflation in the economy may also be affected. At first, this will reduce real long-term interest rates, with the resulting expansionary effects on the economy.

As regards the credit channel[8], it stresses the special role played in monetary transmission by banking credit to the economy. This role is enhanced due to the limited access some economic agents (namely small companies and consumers) have to other financing sources. This credit channel can be broken-down into two sub-channels: the debtor's balance sheet channel and the bank lending channel. The first sub-channel takes into account the changes caused by monetary policy in the value of borrowers' collateral. In turn, the second channel stresses the central bank's ability to influence the amount of credit banks may grant to the economy. Therefore, due to the existence of these widely recognised direct transmission chan-

nels, which are complementary to the interest rate channel, the discussion around the inoperationality of monetary policy in a very low interest rate environment focuses on the debate around the empirical relevance of direct transmission channels. It should be noted that, with deflation and even without additional money injection, if direct channels are relevant in practice, an "automatic stabiliser" effect on economic activity (the so-called Pigou effect) is reached through increases to the real money stock. The money surplus vis-à-vis its desired level yields an effect that is equivalent to a liquidity injection by the central bank, thus stimulating the economy.

Pro-Keynesian economists[9] usually consider that the effects of monetary policy transmission through interest rate changes are dominant, paying little empirical relevance to direct effects taking place with no changes to the interest rate. On the other hand, economists of a more monetarist or neo-classical tradition[10] tend to emphasise direct channels, undramatising the dangers of the liquidity trap, but specially unrecognising monetary policy is inoperative in situations of very low interest rates.

6. INOPERATIONALITY VERSUS OPTIMALITY OF THE MONETARY POLICY GUIDANCE UNDER VERY LOW INTEREST RATES

Regardless of the issue of eventual inoperationality of monetary policy under null or virtually null nominal interest rates, there is the issue around whether there are costs associated to the loss of the interest rate channel. The analysis of this issue requires the comparison between a moderate inflation regime (exhibiting occasionally low interest rates) and a null inflation one (with low interest rates).

Curiously, economic literature on long-run monetary policy rules suggests that an optimal policy is consistent with null or close to zero nominal interest rates (this finding is known in literature as the Friedman rule). The underlying intuition builds upon the idea that the price of a good should equal its marginal production cost. Since

---

(7) The reference to shocks refers to unexpected events.
(8) See for instance Bernark and Gertler (1995).

(9) See for instance Summers (1991).
(10) For example, Friedman (1969) and Meltzer (1999).

money has a negligible production cost, optimality is reached when the price of holding money is null (i.e. the interest rate is zero). This means that the inflation rate should equal the symmetric of the rate of return of capital (i.e., the real equilibrium interest rate), to which corresponds deflation. Even when principles of optimal taxation are taken into account, the Friedman rule seems to hold[11]. The optimality of this rule should, however, be faced with caution since some considerations — of the kind of informal economy taxation, high costs of collecting taxes on consumption and /or income, and the rigidity of nominal wages towards reductions — justify a price stability policy in the long-run (i.e., zero or marginally positive inflation, instead of deflation). Furthermore, the Friedman rule is a long-run one, therefore overlooking the manner in which monetary policy should be managed in the presence of short-run shocks. Furthermore, the arguments on optimal taxation in favour of the optimality of the Friedman rule are conditioned to the kind of economic representation (i.e., the model) considered.

Some recent empirical research trying to measure the costs of losing the interest rate channel compares the effects on output due to unfavourable shocks to the economy in a context of moderate inflation with a zero-inflation one (Fuhrer and Madigan (1997) and Orphanides and Wieland (1998)). The general finding is that a moderate level of inflation is preferred to zero inflation. They conclude that output variability increases with close to zero inflation objectives (where recessions are more frequent and more intense). Other empirical research (Akerlof, Dickens and Perry (1996)) argues that permanent costs are present due to the existence of nominal wages downward rigidity, which also favours a non-zero inflation target.

These studies present, however, several drawbacks. First, they use data from a non-zero inflation environment, and extrapolate findings to a zero inflation regime, which is obviously subject to the Lucas critique (i.e., the adjustment of agents'

_____

(11) For instance Correia and Teles (1996;1999).

behaviour to the change of regime is not taken into account). Moreover, as referred when discussing the Friedman rule, the results of the models considered in these research are conditioned to the type of model and to the simplifications assumed (for instance, the influence of monetary policy is limited to the interest rate channel, ignoring the direct transmission channels referred in section 5).

This discussion illustrates the fact that it is not possible to reach a definitive conclusion on what regime is preferable — a null inflation regime or a low inflation one. Nevertheless, even the Friedman rule critics defend low inflation levels, to which correspond moderate interest rates (as opposed to zero or close to zero interest rates).

7.CONCLUSION

The reflections above and the current European economic situation make us conclude that the euro area is not presently in a liquidity trap situation. First, the current interest rate levels are compatible with a moderately counter-cyclical monetary policy. Furthermore, if important shocks that lead the economy to virtually null interest rate levels come to happen, existing alternative monetary policy transmission channels (namely the exchange rate and policies of communication/management of expectations) should prevent the confirmation of pessimistic scenarios.

In the past, the situations closer to the liquidity trap (the great depression in the USA and the Japanese crisis in the 1990s) took place alongside banking crises, after speculative bubbles in asset prices burst. However, Meltzer (1999) also reports some cases for the USA where very low nominal interest rates were reached without a banking crisis; the Swiss case over the last decades provides also an illustration to this situation. Therefore, more than challenging to the guidance of the monetary policy in the euro area, taken in its strict sense, a situation of virtually null interest rates requires a special effort and awareness from banking supervision, namely in a context of inflation in asset prices.
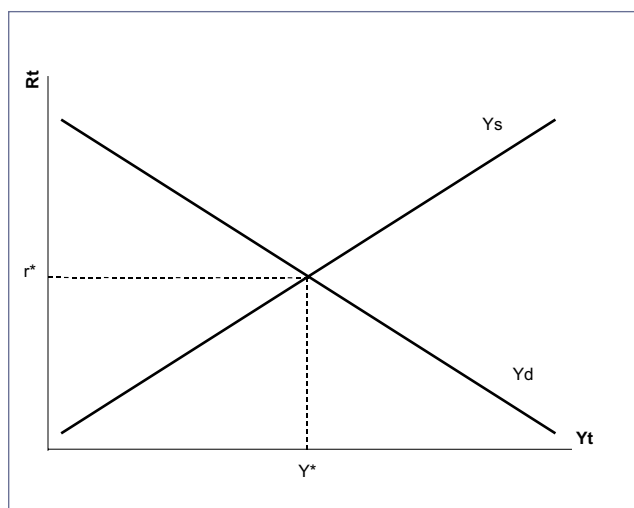
Appendix [12]

In the context of Real-Business Cycle models, monetary policy should promote money neutrality over real activity even in the short-run (a neutral policy meaning a policy allowing to sustain output at its potential level in a context of price stability). This neutrality does not imply that no manoeuvre room is left to the short-run effectiveness of monetary policy. If frictions (e.g., monopolistic competition and price rigidity, with multi-period contracts) exist, monetary policy shall act so that the economy "emulates" the behaviour of an economy free of those frictions.

This position is illustrated below. Consider a closed economy with an aggregate supply curve (*Ys*) and an aggregate demand curve (*Yd*) defined in space (*Yt, Rt*), where *Yt* and *Rt* stand respectively for output and real interest rates. Admit the economy is initially at equilibrium (*Y*, r**):

A favourable (and permanent) shock in productivity can be analysed as follows: an improvement in productivity shifts aggregate supply to the right while it also induces an increase in consumption and a reduction, through the wealth effect, of labour supply. The increase in consumption makes aggregate demand shift outwards, while the re-

duction of labour supply induces an inward shift of aggregate supply, offsetting part of the previous movement (see chart).

Therefore, a favourable productivity shock leads to a rise in equilibrium output, from *Y** to *Y*'*, but renders no significant effect on the real interest rate in the longer-run.

In the adjustment to the new equilibrium, it is possible that the impact on aggregate demand is faster than the impact on aggregate supply, and that the real interest rate rises temporarily. According to this current, to maintain price stability, monetary authorities should rise the nominal interest rate to accommodate the real interest rate increase, and to avoid that the expansionary impact of the shock is too great. This kind of directive
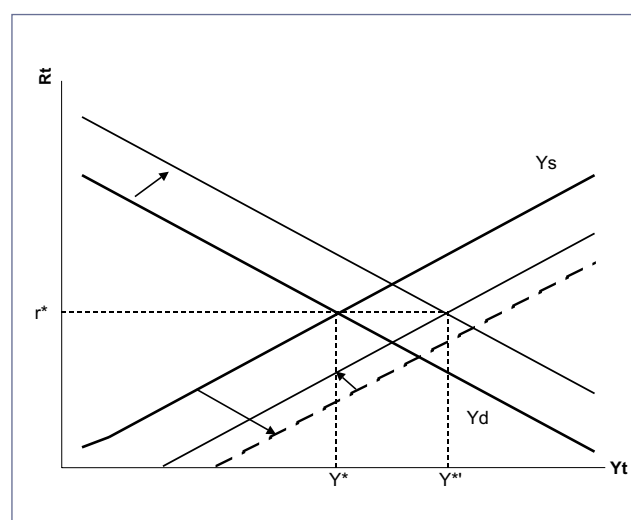
contrasts, for instance, with the posture of the Federal Reserve Bank (the Fed) two or three years ago: the Fed argued that nominal interest rates needn't be raised to control inflation, since a favourable productivity shock had already limited inflationary pressures.

In the case of an unfavourable supply-side shock — of the kind of an increase in imported commodity prices — basically the symmetric of the example presented would have resulted.

---

(12) This Appendix is inspired in the discussion presented by Goodfriend and King (1997).

REFERENCES

Akerlof, George A., William T. Dickens, and George L. Perry (1996), "The macroeconomics of low inflation", *Brooking Papers on Economic Activity.*

Bernanke, Ben S., and Mark Gertler (1995), " Inside the black box: the credit channel of monetary policy transmission", NBER *Working Paper* No. 5146.

Correia, Isabel and Pedro Teles (1999), "Optimal inflation", Banco de Portugal *Economic Bulletin*, March 1999.

Correia, Isabel and Pedro Teles (1996), "Is the Friedman rule optimal when money is an intermediate good?", *Journal of Monetary Economics*, Volume 38, No. 2.

Friedman, Milton (1969), "The optimum quantity of money", The Optimum Quantity of Money and Other Essays, Chicago: Aldine.

Fuhrer, Jeffrey C., and Brial F. Madigan (1997), "Monetary Policy when interest rates area bounded at zero", *Review of Economics and Statistics*, vol. 79, pp. 573-85.

Goodfriend, Marvin, and Robert G. King (1997), "The new neoclassical synthesis and the role of monetary policy", NBER *Macroannual.*

Meltzer, Allan H. (1999), "The transmission process", Bundesbank conference on The monetary transmission process: recent developments and lessons for Europe, March 26-27 1999.

Orphanides, Athanasios, and Volker Wieland (1998), "Price Stability and Monetary policy effectiveness when nominal interest rates are bounded at zero", Manuscript, Board of Governors of the Federal Reserve System, June 1998.

Summers, Laurence (1991), "How should long-term monetary policy be determined?", *Journal of Money, Credit, and Banking*, Vol. 23, No. 3.

Svensson, Lars E.O. (1999), "Price stability as a target for monetary policy: defining and maintaining price stability", Bundesbank conference on The monetary transmission process: recent developments and lessons for Europe, March 26-27 1999.

White, Eugene N. (1990), "The *stock* market boom and crash of 1929 revisited", *Journal of Economic Perspectives*, Vol.4, No. 2.