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Targets for Monetary Policy**

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PRICE STABILITY AND INTERMEDIATE TARGETS FOR MONETARY POLICY*

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Abstract

Monetary policy strategy in Portugal has been presented in recent years as pursuing the final goal of price stability through an exchange rate stability target. This paper argues that a central bank committed to the goal of price stability – meaning low inflation in the medium/long run – can successfully control average inflation in the economy drawing up a strategy that involves an intermediate monetary target (exchange rate or money). Arguments in favour of the use of an intermediate monetary target in terms of communication strategy are briefly discussed.

* The ideas expressed in this paper are drawn from previous work by the authors, largely developed during 1997 (see Gaspar (1997)) and presented in more detail in Abreu (1998). The authors would like to thank António Pinto Barbosa, Isabel Horta Correia and Oreste Tristani for helpful comments and suggestions. The views expressed herein are those of the authors and not those of the Banco de Portugal.

1. Introduction

Price stability is widely accepted as the primary goal for monetary policy. The fundamental reason to pursue price stability¹ is that inflation is economically and socially costly. This is strikingly illustrated by the empirical evidence showing negative correlation between inflation and growth in the long run². Throughout the world central banks have come to adopt long run price stability as their overriding goal, operating either in the context of explicit mandates set by law or following, in practice (without legal reforms), strategies for controlling inflation.

Monetary policy cannot be used to systematically affect real variables and persistent inflation is always a monetary phenomenon³. Nevertheless, in the short-run monetary policy affects both nominal and real variables, albeit with long and variable lags.

It has been pointed out in the literature that the temptation of decision makers to focus monetary policy on the short-run results in an inflation bias, causing higher than socially optimal inflation rates, without any lasting favourable effects on the real side of the economy. Recent developments in the literature provided solutions to the inflation bias problem⁴. Optimal design of monetary institutions changes policymakers' behaviour thereby improving economic performance. One way is to make price stability the overriding goal of monetary policy and delegate policy to an operationally independent central bank. Alternatively, an optimal incentive contract for an independent central bank can be designed, making the central bank accountable for the inflation outcomes⁵. The adoption of explicit inflation targets for monetary policy has also been defended as a more practical alternative to inflation contracts, in which delegation prescribes an appropriately chosen target rate of inflation⁶.

The starting point of this paper is, therefore, that the central bank conducts monetary policy to achieve and maintain price stability. Assuming that the central bank wants to attain some inflation rate in the medium/long run, this paper discusses the strategies for monetary policy

¹ According to A. Greenspan (1996), “ (...) price stability obtains when economic agents no longer take account of the prospective change in the general price level in their economic decisionmaking”. In practice, it means low inflation, typically 0 to 2 percent per year.

² See Briault (1995).

³ See Lucas (1996).

⁴ See Obstfeld and Rogoff (1996) for a summary of this literature. See also Persson and Tabellini (1990) and Schaling (1995) for detailed surveys of the main contributions.

⁵ See Walsh (1995) and Persson and Tabellini (1993).

⁶ See Svensson (1997). See also Muscatelli (1995).

to achieve this goal⁷. In particular, we analyse the question of using intermediate monetary targets (monetary aggregates or exchange rates) consistent with this final inflation goal.

Why should central banks care about using intermediate targets for monetary policy, whatever these might be? As mentioned before, the transmission of monetary policy actions to the economy and, in particular, to the general price level occurs with lags that can be quite long. Two immediate consequences can be drawn out of this fact. The first is that successful monetary policy must be forward-looking. Monetary authorities should base their policy actions on a forward-looking assessment of the likely direction of inflation and change policy if the prospects appear undesirable. The second is that current monetary policy cannot be evaluated *ex post* before the inflation out turn has been observed several periods later.

In this context the use of an intermediate target for monetary policy may appear to be desirable. Ideally such a target should be readily available, reliably under the central bank's control, have a predictable relationship with the final goal, be capable of providing an adequate framework for policy discussion and, last but not least, help in communicating the monetary policy strategy to the public. This last requirement suggests that the intermediate target should be compatible with a simple and robust framework allowing the central bank to explain its policy actions and the inflation outcomes. An intermediate target with such properties increases central bank's accountability and improves the credibility of monetary policy.

Several authors have argued that central banks pursuing inflation targets ought to use their inflation forecast as an explicit intermediate target – inflation targeting implies inflation forecast targeting⁸. The arguments are that the inflation forecast is the current variable more correlated with the goal; it is more controllable than the goal and it can be made very transparent and more observable than the goal (assuming that the central bank reveals its forecast). This paper argues that the use of an intermediate monetary target by a central bank pursuing an inflation goal over the medium/long run is a viable alternative, with strong arguments in favour in terms of deciding, implementing and reporting on monetary policy.

⁷ Note that the possibility of the central bank responding to other economic developments in the short-run is not being excluded, as long as this is done only to the extent that it does not interfere with the primary goal of low and stable inflation. Bernanke and Mishkin (1997) argue that this is the right way to interpret monetary policy strategies with inflation targets, i.e. they should be understood as a policy framework, where discretionary policy actions can be accommodated, rather than ironclad policy rules. King (1996) adopts a similar view.

⁸ See Svensson (1996), Haldane (1995b) and also King (1994).

Given that the relationship between money and prices in the long run is soundly supported on theoretical and empirical grounds⁹, the use of monetary variables as nominal anchors seems quite natural. The main aim of this paper is to discuss the use of intermediate monetary targets in small open economies. The motivation is to help to understand the monetary policy strategy of a country like Portugal, where monetary policy has been presented in recent years as following the final goal of price stability through an exchange rate stability target. We argue that a central bank committed to the goal of price stability can successfully control average inflation in the economy drawing up a strategy that involves an intermediate monetary target (exchange rate or monetary aggregate).

This paper differs from recent work on this topic inasmuch as it focus on the use of monetary variables as nominal anchors and argues that intermediate monetary targets properly designed do not mean, as sometimes suggested, that the central bank discards relevant information about future inflation in the economy. Nevertheless, the argument is established making use of a very simple and standard framework – monetary policy can not affect real variables in the economy, not even in the short run. Questions concerning the instruments used by the central bank to control monetary variables cannot be answered within this framework.

The paper is set out as follows. In section 2 we present a simple macroeconomic model of a small open economy and discuss the results obtained whether the central bank decides to follow an exchange rate or a money growth target, provided that the final goal is to stabilize inflation in the economy at some level. Section 3 concludes the paper.

2. Intermediate and final targets: a small open economy model

Assume that monetary policy is conducted by a central bank that cares only about inflation and wants to stabilize it around a predetermined value, $\bar{\pi}$ ¹⁰. The behaviour of the private sector is described by a simple stochastic macroeconomic model¹¹, in discrete time, where expectations are formed rationally. Suppose that the behaviour of the private sector is described by the following equations:

$$y_t^d = -b_r r_t + b_q q_t + b_y y_t^* + z_t \quad (1)$$

⁹ See Lucas (1996).

¹⁰ Therefore there are no dynamic inconsistency problems.

¹¹ Similar models have been presented by several authors, namely Obstfeld (1985), McCallum (1989) and Krugman (1991). They are representative of standard analysis in open economy macroeconomics.

$$r_t = i_t - (p_{t+1}^e - p_t) \quad (2)$$

$$q_t = s_t + p_t^* - p_t \quad (3)$$

$$i_t = i_t^* + (s_{t+1}^e - s_t) \quad (4)$$

$$m_t - p_t = c_y y_t - c_i i_t + v_t \quad (5)$$

$$y_t^s = \bar{y}_t \quad (6)$$

$$y_t^d = y_t^s = y_t \quad (7)$$

The variables y_t , p_t , q_t and s_t denote real output, price level, real exchange rate and nominal exchange rate, respectively. The nominal interest rate is i_t and r_t is the expected real interest rate. Nominal money balances are m_t . The foreign variables are indicated by the superscript $*$. The superscript e denotes the expectation formed at date t of the associated variable. All the variables, except interest rates, are expressed in logarithms. The parameters b and c are positive constants.

The economy is small in the sense that changes in domestic variables do not have a significant impact on conditions abroad. It is assumed that foreign variables are exogenous and, moreover, that foreign output and real interest rate are constant at levels y^* and r^* , respectively.

Equation (1) is a standard IS function for an open economy, involving a negative effect on demand from the real interest rate and a positive effect from the real exchange rate and foreign output. The variable z_t represents an exogenous real disturbance, which we assume to have essentially a permanent nature ($z_t = z_{t-1} + \varepsilon_t$ where ε_t is a white noise). Equation (5) is a standard LM function. The demand for money is increasing in income and decreasing in the nominal interest rate. The variable v_t represents a stochastic effect on the demand for money, which is also assumed to be a random walk ($v_t = v_{t-1} + \eta_t$ where η_t is a white noise). The money market clears every period.

Equation (2) is the usual Fisher relation. The expected real interest rate equals the nominal rate less the expected inflation rate. The notation p_{t+1}^e denotes the expectation of the price level in period $t+1$ conditional on the information available at period t , $p_{t+1}^e = E(p_{t+1} | \Omega_t) = E_t p_{t+1}$, which we assume to include values from period t and all previous periods of the model's variables. Equation (3) defines the real exchange rate as the relative price between

foreign and domestic output (s_t is the domestic-currency price of foreign exchange). An increase in the real exchange rate represents a real depreciation of the domestic currency. The uncovered interest parity condition is assumed to hold – equation (4) – in a context of international capital mobility. For analytical simplicity, the risk premium is taken as constant and neglected in the analysis.

We assume that the economy under analysis is one in which prices are fully flexible so that output conforms to the full employment level in each period, $\bar{y}_t$ – equations (6) and (7). $\bar{y}_t$ is generated by an exogenous process and, for simplicity, is assumed to be constant over time. This ‘classical’ version of the model simplifies substantially the argument because the model dichotomises into a real and a monetary block.

When expectations are formed rationally it is crucial to define which information is available to agents. We assume that all relevant information is symmetric, i.e. equally available to the monetary authority and to the private sector. Everybody is assumed to know the model and the processes describing the shocks. The private sector also knows the objectives of the monetary authority.

The hypothesis adopted of fully flexible prices will allow us to solve the model for the equilibrium path of endogenous real variables before we turn to the monetary part of the system and to the specification of central bank’s behaviour when setting monetary policy. In this type of economy the monetary authority is not able to affect real variables, not even in the short run. To determine the equilibrium path for the real exchange rate, q_t , first substitute out equations (2), (4) and (6) into equation (1), use the definition of foreign real interest rate and rearrange to obtain:

$$b_r E_t q_{t+1} - (b_r + b_q) q_t = -\bar{y} - b_r r^* + b_y y^* + z_t \quad (8)$$

This relation involves only the endogenous variable q_t and variables determined by exogenous processes. We can solve this first-order expectational difference equation using the method of undetermined coefficients. Guessing a solution for q_t in the (minimum number of) predetermined state variables¹²:

$$q_t = \phi_0 + \phi_1 z_{t-1} + \phi_2 \varepsilon_t \quad (9)$$

Running the expectations operator through (9), substituting into equation (8), equating

¹² See McCallum (1989).

coefficients on both sides of the equation (constant, coefficients on z and coefficients on ε) and solving for ϕ_0 , ϕ_1 and ϕ_2 gives us:

$$q_t = \frac{1}{b_q} (\bar{y} + b_r r^* - b_y y^*) - \frac{1}{b_q} z_t \quad (10)$$

In this model increases in the demand for domestic goods are associated with a real exchange rate appreciation and increases in the supply side are associated with a real depreciation¹³. The persistence of movements in the real exchange rate is implied by the assumptions made about real disturbances¹⁴.

Noting that the real exchange rate is exogenous to the economy's monetary variables, we can now turn to the analysis of the monetary block of the model. The model is incomplete because we have not yet specified monetary policy behaviour. Assume that the central bank wants to stabilize inflation in the economy at a constant level, called $\bar{\pi}$. We also assume that (at the end of) each period the central bank chooses its policy before knowing the real and monetary disturbances that will affect the economy next period. Similarly, we could say that the monetary authority can act on current information but the policy does not have an instantaneous effect. When exogenous shocks occurred at period t become known, the central bank can only affect the policy that is going to prevail at period $t+1$. This feature introduces an imperfect control of prices in the economy. In the context of our model this means that, at period t , the central bank sets policy for period $t+1$ to attain $(E_t p_{t+1} - p_t) = \bar{\pi}$. Having an inflation goal corresponds to having a goal for expected inflation since the economy is subject to disturbances unknown by the authority at the moment of setting policy.

Given the monetary policy rule, we want to show that it is possible to determine an intermediate monetary target – whether exchange rate or money growth target – that assures that the expected (average) inflation in the economy equals $\bar{\pi}$.

¹³ Note that z_t represents essentially real disturbances on the economy, which although presented as demand shocks could easily be considered as supply shocks.

¹⁴ These could have been chosen so as to make fluctuations of q_t exhibit a great deal of persistence but with a temporary nature, more in line with the empirical regularity. However, the results would not be substantially different.

Intermediate exchange rate target

Suppose first that the central bank controls the exchange rate, although imperfectly¹⁵. At each point in time, t , the central bank sets the exchange rate for next period, s_{t+1} , so that $(E_t p_{t+1} - p_t) = \bar{\Pi}$. Since the model is stochastic, the authority does not know the shocks that will affect the economy in $t+1$ and it is assumed that the policy can not respond to them (the policy is not state-contingent). Assume that the exchange rate variation is constant, up to a random error due to imperfect control:

$$s_{t+1} - s_t = \alpha + \Psi_{t+1} \quad (11)$$

where α is a constant to be determined and Ψ_{t+1} is a white noise. Take the definition of the real exchange rate – equation (3) – first-difference and take expectations conditional upon information available in period t :

$$E_t p_{t+1} - p_t = (E_t s_{t+1} - s_t) + (E_t p_{t+1}^* - p_t^*) - (E_t q_{t+1} - q_t) \quad (12)$$

Inspection of equation (10) shows that the best forecast of the real exchange rate each period is last period's value, given the permanent character of real shocks. That is:

$$E_t q_{t+1} - q_t = -\frac{1}{b_q} (E_t z_{t+1} - z_t) = 0 \quad (13)$$

Assume, for simplicity, that the foreign inflation rate evolves around a constant mean, Π^* , up to a random error:

$$p_{t+1}^* - p_t^* = \Pi^* + \rho_{t+1} \quad (14)$$

where ρ_{t+1} is a white noise disturbance. Using equation (13) and taking expectations as of date t of equations (11) and (14) leads to the following expression for the expected inflation rate:

$$E_t p_{t+1} - p_t = \alpha + \Pi^* \quad (15)$$

¹⁵ The monetary policy instrument used by the central bank to control the intermediate monetary variable (exchange rate or monetary aggregate) will not be specified. This is not only because of the extreme simplicity of the model but, mainly, because we want to consider the possibility that different monetary policy frameworks, and consequently different instruments, might be chosen depending on the monetary variable that the central bank chooses to control.

It is then possible to determine the expected exchange rate variation, α , compatible with attaining an average inflation rate equal to $\bar{\Pi}$ in this economy:

$$\alpha = \bar{\Pi} - \Pi^* \quad (16)$$

Note that if the inflation goal is similar to the average foreign inflation rate the monetary policy strategy could be simply presented as a strategy with an intermediate target of exchange rate stability. The exchange rate target thus defined assures that the expected inflation, conditional on the available information, equals the inflation goal.

Ex-post actual exchange rate variation will deviate from the target because the central bank has imperfect control over the exchange rate:

$$s_{t+1} - s_t = \bar{\Pi} - \Pi^* + \Psi_{t+1} \quad (17)$$

Inflation will deviate from the desired level also due to forecast errors caused, in turn, by unanticipated disturbances occurring after the central bank has set policy. Full price flexibility guarantees that prices in the economy will immediately adjust to shocks to clear the goods market.

$$p_{t+1} - p_t = \bar{\Pi} + \Psi_{t+1} + \rho_{t+1} + \frac{1}{b_q} \varepsilon_{t+1} \quad (18)$$

Monetary policy in the case just presented is devoted to an intermediate exchange rate target, as a means to attain a final inflation goal. That being the case, money growth will be endogenously determined. The central bank must supply money to the economy according to demand, at the interest rate consistent with the exchange rate target. According to the uncovered interest parity condition – equation (4) – the domestic nominal interest rate is given by:

$$i_t = i^* + \bar{\Pi} - \Pi^* \quad (19)$$

where we use the simplifying assumptions about the foreign real interest rate and the foreign inflation rate. Money in this economy grows at the same rate as inflation, since there is no economic growth (output is constant at level $\bar{y}$), plus adjustments due to velocity shocks. Using equation (5) and the result for inflation from above we get¹⁶:

¹⁶ Note that, in our model, determining an equilibrium path for the nominal exchange rate, prices and money

$$m_{t+1} - m_t = p_{t+1} - p_t + v_{t+1} - v_t = \bar{\Pi} + \Psi_{t+1} + \rho_{t+1} + \frac{1}{b_q} \varepsilon_{t+1} + \eta_{t+1} \quad (20)$$

It is also useful to look at the variance of inflation. For intermediate exchange rate targeting the relevant expression is:

$$\sigma_p^2 = \sigma_\psi^2 + \sigma_\rho^2 + \frac{1}{b_q^2} \sigma_\varepsilon^2 \quad (21)$$

where σ_i^2 is the variance of variable i and where, for simplicity, shocks affecting the economy have been considered to be mutually independent.

Intermediate money growth target

Suppose now that the central bank controls money, although imperfectly. As before, the central bank sets the money supply for next period, m_{t+1} , so the expected inflation rate between periods t and $t+1$ equals $\bar{\Pi}$. Again, the monetary policy can not be a feedback policy because the shocks affecting the economy in period $t+1$ are unknown to the central bank in period t . At $t+1$ it is still assumed that the policy can not respond to them. Assume that money grows at a constant rate plus a random error due to the imperfect control of the authority over money:

$$m_{t+1} - m_t = \mu + \phi_{t+1} \quad (22)$$

where μ is the growth rate to be determined and ϕ_{t+1} is a white noise disturbance.

Given this specification of money supply behaviour it is possible, in this case, to determine the equilibrium path for prices in the economy and afterwards the money growth rate that assures $(E_t p_{t+1} - p_t) = \bar{\Pi}$. Substitute equations (3), (4) and (6) into the LM function, use equations (10) and (14) and rearrange to get:

$$c_i E_t p_{t+1} - (1 + c_i) p_t = c_y \bar{y} - c_i r^* - m_t + v_t \quad (23)$$

This first-order expectational difference equation can be solved using the same method as before. Knowing the process generating m – equation (22) – and given that the model is linear we can guess a solution for p_t :

(instead of their growth rates) would require imposing some initial condition to the model.

$$p_t = \Phi_0 + \Phi_1 m_{t-1} + \Phi_2 \varphi_t + \Phi_3 v_{t-1} + \Phi_4 \eta_t \quad (24)$$

The solution of the difference equation is then:

$$p_t = -c_y \bar{y} + c_i r^* + c_i \mu + m_t - v_t \quad (25)$$

This result can be used to determine the expected money growth rate, μ , that leads to an average inflation of $\bar{\Pi}$ in the economy. It will be given by:

$$E_t(\mu + m_t + \varphi_{t+1} - v_t - \eta_{t+1} - m_t + v_t) = \bar{\Pi} \quad (26)$$

that is,

$$\mu = \bar{\Pi} \quad (27)$$

In this economy, pursuing an intermediate monetary target so that money growth equals $\bar{\Pi}$, on average, assures that the average inflation in the economy will also be equal to $\bar{\Pi}$. In this case the money growth rule is very simple, given the extreme simplicity of the model. In a more elaborate setting, the formulation of the money growth target could turn out to be a somewhat complicated rule. However, the point is that given that there exists a (predictable) relationship between money and prices, it is possible to formulate a money growth target that assures that average inflation in the economy equals the inflation goal. In fact, this could be called a ‘conditional’ intermediate target, i.e. the path that the intermediate monetary variable must follow in order to maintain the expected inflation on the desired level.

As before, ex-post the money growth rate in the economy will deviate from $\bar{\Pi}$ due to control errors,

$$m_{t+1} - m_t = \bar{\Pi} + \varphi_{t+1} \quad (28)$$

and the realized inflation rate will also differ from $\bar{\Pi}$ due to money control errors and velocity shocks not foreseen by the monetary authority:

$$p_{t+1} - p_t = \bar{\Pi} + \varphi_{t+1} - \eta_{t+1} \quad (29)$$

In this case, where the central bank controls money in the economy, the exchange rate becomes endogenously determined. Given the equilibrium path for the real exchange rate and for the price level presented above, the equilibrium path for the nominal exchange rate is hence:

$$s_t = a_y \bar{y} + a_r r^* - a_{y^*} y^* + c_i \mu - p_t^* + m_t - v_t - \frac{1}{b_q} z_t \quad (30)$$

$$\text{where } a_y = \frac{1}{b_q} - c_y, \quad a_r = \frac{b_r}{b_q} + c_i \quad \text{and} \quad a_{y^*} = \frac{b_y}{b_q}.$$

Any other shocks affecting the economy will now induce adjustments of the nominal exchange rate to clear the goods market. The exchange rate variation becomes:

$$s_{t+1} - s_t = \bar{\Pi} - \Pi^* + \phi_{t+1} - \rho_{t+1} - \frac{1}{b_q} \varepsilon_{t+1} - \eta_{t+1} \quad (31)$$

Note that in both cases considered above when a monetary variable is controlled by the central bank, whether exchange rate or money, the other becomes endogenously determined and hence responds to the contemporaneous shocks imposed on the economy. The controlled variable only responds contemporaneously to control shocks.

The two cases presented show that even if both strategies – intermediate exchange rate target or intermediate money growth target – can be defined to guarantee that the average inflation in the economy equals the inflation goal, they will result in different inflation variability and so in a different equilibrium. To see this, note that the variance of inflation in the case where the central bank chooses to control the money growth changes to¹⁷:

$$\sigma_p^2 = \sigma_\phi^2 + \sigma_\eta^2 \quad (32)$$

where σ_i^2 is the variance of variable i and where, again for simplicity, shocks affecting the economy have been considered to be mutually independent.

Which strategy implies a lower variability of inflation depends on the variance of real and monetary disturbances affecting the economy. Thus, this analysis indicates that a central bank committed to the goal of price stability can successfully control average inflation in the economy with a strategy defined in terms of an intermediate monetary target. However, depending on the intermediate target chosen, inflation variability can turn out to be somewhat different. The result is here interpreted as reflecting distinct operational frameworks for monetary policy. Nevertheless, we believe that, in practice, the difference in terms of the

¹⁷ Note that, in this case, shocks affecting the nominal exchange rate do not have an impact on inflation variability because inflation is being simply measured by domestic output prices.

reaction function of the central bank will not be too marked and we emphasise once again that, on average, the central bank will deliver low inflation¹⁸.

The argument made in this paper differs from previous results in the literature in two ways. First, in the literature, monetary or exchange rate targeting strategies are usually presented as inefficient strategies, where the central bank feeds back from a single indicator and discards other relevant information for predicting future inflation. This paper argues that, given that price stability is the final objective of monetary policy, the intermediate monetary target can be properly designed to assure that the inflation forecast equals the inflation goal. A ‘conditional’ intermediate monetary target thus designed means that the central bank is taking into account all relevant information about future inflation.

Second, Svensson (1996) showed – for a closed economy – that ‘sophisticated’ money growth targeting can be made equivalent to inflation targeting, that is, it can achieve the same equilibrium, with average inflation equal to the inflation target and with the same variability of inflation. More precisely, he showed that it is possible to determine a money growth target such that the reaction function of the central bank is the same whether it decides to pursue the money growth target or the inflation target. We understand that this result holds only when the monetary policy framework is taken as given. Once specified the monetary policy instrument both strategies can be made precisely equivalent, resulting in the same reaction function for that instrument. As shown, this may not be the case if we take into consideration that controlling different intermediate monetary variables may require different monetary policy frameworks.

Using the simple model presented above for a small open economy it is possible to demonstrate that Svensson’s result holds if we postulate the monetary policy instrument. In this type of standard model the usual assumption – although unrealistic – would be that money is the instrument of the central bank (perfectly controlled). Given this presumption it is quite easy to show that intermediate exchange rate targeting can be made precisely equivalent to inflation targeting. In fact, in the above model, whether the central bank’s objective is to stabilize expected inflation around $\bar{\pi}$ or to stabilize expected exchange rate variation around $\bar{\pi} - \pi^*$, the implied reaction function for money growth would be exactly the same. Both would result in the same equilibrium, as regards average inflation and deviations from

¹⁸ Note also that there is some evidence that the variability of inflation is likely to be lower at lower rates of inflation. See Briault (1995).

the desired inflation level.

There are some obvious limitations of the model presented in this section. It is a very simple although quite standard macroeconomic model and, consequently, its main weakness is the lack of microfoundations. However, it seemed appropriate to establish an argument that from the start looked quite straightforward.

3. Conclusion

The use of an intermediate monetary target besides being a viable option to achieve and maintain price stability provides a framework for policy discussion and helps in communicating the monetary policy strategy to the public. The presentation of the strategy and public understanding of the policy actions are crucial elements regarding credibility and accountability of the central bank.

In the case of a small open economy pursuing price stability, the exchange rate might be consistently used as the nominal anchor. The monetary policy strategy in this case can be presented with the help of a simple real exchange rate equation. The nominal exchange rate target will depend on the difference between the domestic inflation goal and the predicted foreign inflation rate, after taking account of the expected real exchange rate variation over the medium/long term. The real exchange rate equation is an identity meaning that it is valid each period, independently of the ‘true’ model of the economy and of the lags in the effects of monetary policy. As such, ex-post the central bank is always able to communicate effectively within this simple framework. The connection between the exchange rate target and the final inflation goal is quite clear and, consequently, the intermediate nature of the first can be stressed. The medium/long run time span assures the consistency between the two targets. Nevertheless, deviations from the exchange rate target will be accepted as long as they are consistent (or even necessary) to the attainment of the final goal. When some conflict arises the final goal always takes precedence¹⁹.

This way of formulating the exchange rate target assumes that the central bank is able to forecast the real exchange rate variation over the medium/long run. In the long run, the real exchange rate is a real not a monetary phenomenon. If real factors, like technologies or preferences, justify persistent deviations from relative purchasing power parity relationship

¹⁹ This strategy seems to be explicitly followed also, for example, by the central banks of Iceland, Finland and Spain. See Central Bank of Iceland (1994), Bank of Finland (1996) and Banco de España (1996).

(PPP)²⁰ that must be taken into account when deriving the nominal exchange rate target. Otherwise, if PPP holds, the strategy for achieving price stability can be simply explained as an intermediate target strategy of exchange rate stability against low inflation countries²¹.

Monetary targeting can also be used as an effective communication device to explain monetary policy strategy and decisions. In general the target for money growth can be presented with the help of a simple velocity equation. The growth rate of the money stock will depend on the inflation aimed at over the medium term, after taking due account of forecasts of the potential output growth and of the trend change in the velocity of circulation. This way of formulating the monetary target presumes that the central bank is able to forecast the trend in velocity, meaning that there exists a stable long-term money demand relationship, which seems to be the case in Germany²². If the central bank succeeds in getting the money stock to grow in line with this target, inflationary stimuli to the economy will be avoided²³.

The link between the monetary target and the final goal of monetary policy, and as such the intermediate nature of the monetary target, is therefore emphasised in policy presentation. The medium-term orientation of the strategy is also stressed²⁴. In the case of the German central bank, willingness to accept deviations from the monetary target has often been demonstrated if doing so granted better success in attaining the ultimate goal²⁵. In other words, priority is always given to the final goal of monetary policy in case of conflict. Nevertheless, the monetary target is seen as being valuable both in terms of organising the debate and help in communicating monetary policy decisions to the public.

²⁰ See Froot e Rogoff (1995) and Rogoff (1996).

²¹ In the case of Portugal, there is evidence of a cointegration relationship between prices in Portugal and in Germany, measured in escudos. See Marques, Botas and Machado (1996).

²² See Issing (1997).

²³ This is in accordance with the concept of 'price gap'. See Deutsche Bundesbank (1992) on this point.

²⁴ Medium/long term horizon assures that the money growth target thus determined is consistent with attaining the desired inflation. To assure consistency between the two targets in the short run other factors would have to be taken into account. However, the use of a target range rather than a single figure target possibly accounts for these factors and also for the limited accuracy of the exercise, besides giving some discretion to the central bank to react to other developments in the economy. See Issing (1997).

²⁵ See von Hagen (1995).

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