CHALLENGES FOR MONETARY POLICY AND THE ENLARGED EUROLAND

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Abstract

The recent outset of European Monetary Integration with the introduction of a unique currency and a full centralization of monetary policy together with the increasing integration of global capital markets, stimulated a large body of research on monetary policy rules. Since Lucas' critique, the need to find rules which are at the same time simple and accountable has been a first goal for researchers and policy makers. In fact, policy can be effective only if it is credible. Credibility is enhanced thorough the adoption of simple, accountable monetary policy rules. However, the big question is: what kind of rules ?
This paper tries to address the critical aspects in monetary policy modelling with a special emphasis to Euro-Enlargement.

Keyword : Monetary Policy Modelling

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Challenges for Monetary Policy and the Enlarged Euroland

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1. Introduction

The recent outset of European Monetary Integration with the introduction of a unique currency and a full centralization of monetary policy together with the increasing integration of global capital markets, stimulated a large body of research on monetary policy rules.

Since Lucas' critique, the need to find rules which are at the same time simple and accountable has been a first goal for researchers and policy makers. In fact, policy can be effective only if it is credible. Credibility is enhanced thorough the adoption of simple, accountable monetary policy rules. However, the big question is: what kind of rules ?

The main conclusion from the recent body of research are:

1. From the empirical point of view, a Taylor rule where nominal interest rate is set as reacting to inflation and output, performs well over the sample 1982-1999, for data on US economy in most models presented in the book.

2. The fitting performance can be improved by raising the coefficient on inflation and output targeting (or output-gap targeting).

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3. Simple rules with few lags perform better than more complicated policy rules, with many lags.

4. The inclusion of an inertial element for the interest rate makes interest rate to perform better than standard, simple Taylor rules.

Many of these papers have recently become an important benchmark for research in monetary economy. However, there are many aspects that deserve a full discussion. This paper tries to address the critical aspects in moetary policy modelling with a special emphasis to Euro-Enlargement.

2. Monetary Policy Modelling: distinguishing Features

Many of the models of the recent literature share the inclusion of monopolistic competition and stress the importance of nominal rigidities. The wide applicability of the framework here considered makes possible the reconciliation of two different school of thought, the Neoclassical Macroeconomics and the neo-Keynesian Macroeconomic.

As discussed by Goodfriend and King (1997), the New-Neoclassical Synthesis reduced very much the ideological content of macroeconomic modelling. In fact, in a well microfounded Real Business Cycle (RBC, henceforth), money is considered together with several form of stickiness. The traditional RBC models focused only on technological shocks as the main source of economic fluctuations. The advantage of RBC modelling framework is to have a sound microfounded framework, in a general equilibrium context. In traditional RBC models there is no role at all for monetary stabilization policies and the absolute price level is completely irrelevant for resources allocation, which instead depend only from relative prices.

In the recent past, research on monetary policy identification on the empirical grounds achieved remarkable successes, especially after the introduction of VAR modelling. Moreover, the performance of many central banks around the

world has fully succeded in achieving a stable and low inflation rate. Despite this, the theoretical ground did not achieve any success in constructing a model on which - at least in principle - everybody could count when formulating policy recommendations. This situation has produced an important dichotomy between central bank practice and theoretical work that makes the urgency of being closed up. The type of model that the scientific community is looking for is necessarily a mixture between RBC elements and traditional Keynesian models. Old-fashioned Keynesian Theory considers a set of mechanical reaction function of wage and prices to some measures of market disequilibrium. After the Lucas critique, this procedure has been harshly criticized because of the intrinsic instability attached to such structural relationships. The modelling framework adopted in the new model generation considers an explicit microfoudation for all the stickiness phenomena. Prices and wages - although sticky - are optimally set after the maximization of a given criterion function by the decision makers who are in charge to set them. This type of nominal rigidities is generally modelled in a way that includes a form of forward-looking behavior, by allowing the response of prices to expectations about the future and the current state of the economy.

Obviously, the presence of those assumptions, opens up new questions in terms of optimality of the chosen policy rule. In particular, the presence of monopolistic competition and nominal rigidities includes an explicit source of distortion in the model. In general, monetary authority aims to stabilize an appropriately defined price index. In fact, the instability of the general price index causes substantial real distortions, amplified by the presence of monopolistic competition and nominal stickiness. For these reasons, it is highly desirable to construct rules which could be able to deliver a stable and low inflation rate.

In general, the type of monetary policy rules here considered has two main targets: inflation and output. As a measure for output, almost all the authors consider the output gap, given by the difference between the actual (observed)

output and the level of output associated to the full employment equilibrium (the potential output). The definition of the output gap is very problematic, indeed. In fact, from the theoretical point of view the level of potential output is the level of output reached by an economy without rigidities or distortions. However, the steady state level of actual output is not Pareto optimal. If prices are not constantly adjusted, the instability of the price level generates discrepancies between relative prices, creating an inefficient sectorial allocation of resources. It becomes clear, then, why a strong concern toward inflation stabilization often implies also output stabilization. In order to clarify these issues, it is strictly necessary to adopt a sound welfare criterion through which it is possible to compare the various policy configurations.

3. The Design of Nominal Rigidities

Nominal rigidities can be considered under the form of both price and wage rigidities. Essentially, in the current literature have been proposed four methods for introducing price rigidities[1]:

a. Staggered Price Setting;

b. Calvo Method of Price Adjustment, as in Calvo (1983).

c. Menu Costs approach, based on quadratic cost of price adjustment à la Rotemberg (1982).

d. State-dependent pricing, as in King and Wolman (1999).

The literature on monetary policy rules of which the contribution contained in the book edited by Taylor are a good example, concentrated on the Calvo method of price adjustment. This method is based on a very simple principle: the

[1] In what follows, the discussion will be mainly focused on price rigidities. Wage stickiness is introduced via similar methods. See *infra*.

number of firms changing price after a specific shock, is predetermined. So, each firm changes her prices without knowing if it will belong to the set of changing or that of non-changing firms. The optimal price choice is done intertemporally, via the maximization of the expected profit function.

The quadratic cost approach is also known as *menu cost* approach and evaluates the cost of changing the price in terms of output. This approach has been introduced by Rotemberg (1982), and successively extended to a full general equilibrium framework by Kim (2000), Ireland (1997). Other than the menu costs interpretation, sometimes too restrictive, the recent contributions of this branch of literature tend to consider this approach as the cost suffered by each firm after a price change, due to the nexus of complex relationships entertained by a firm with his customers (advertisements, announcements, reputation cost, and so on). To be concrete, the menu cost is represented via the following function:

$$PAC_{jt} = \frac{\phi_p}{2}\left(\frac{P_{jt}}{P_{jt-1}} - \pi\right)^2 Y_t \tag{1}$$

From (1) the cost of price adjustment PAC_{jt} for firm producing good j, is a quadratic deviation of the growth rate of prices set by firm j and the overall inflation rate, Y_t is the level of output. In (1), ϕ_p is a parameter describing the magnitude of the cost of price adjustment: higher ϕ_p, smoother will be the price level. According to (1), each firm pays a cost when growth rate of his product prices differes from the aggregate inflation rate. The traditional menu cost approach is obtained with $\pi = 1$.

Probably, the closest approach to the empirically observed behavior of firms, collected via micro data is the state-dependent pricing: the price changes occurs only after the occurrence of a particular state of the economy. The only paper dealing with this approach has been written by King and Wolman (1999). Despite this, however, the level of analytical complexity involved by state-dependent pricing is so high that, there is no consensus so far on the concrete applicability

of this approach in a general equilibrium framework with a large real side.

Operationally, the most widespread adopted methods are (b) and (c). It is difficult to identify which methods among (b) and (c) could be the best for modelling nominal rigidities. The Calvo method is closer to the empirical evidence collected from micro data. However, the menu cost approach via equation (1) has the advantage of being very tractable, and probably more easily interpretable along a new approach, which I call here the 'informational approach'. As stressed by Zbaracki et al. (2000) the benefits from infrequent price changes do not come necessarily from a lower menu cost, but with the information associated to the cost of changes. Some authors, as Woodford (2002), for example, interpret this as an argument in favor of the adoption of a price setting mechanism independent upon current market conditions. However, what it is crucial is that prices are sticky in reaction to a specific shock. In fact, the information-based argument outlined by Zbaracki et al. (2000) and extended by Sims (1998) stress the fact that the evolution of prices is sticky because of the existence of strong informational problems, as I will discuss later on.

A crucial element considered by this modelling framework is given by the interaction between pricing decision among different price setters captured by the elasticity of substitution between differentiated goods θ. This interaction can be well described by a game between suppliers of different goods. Thus, given aggregate demand, the spending decisions of a single agent i with respect to others agents are said to be *strategic complements* if the increase in price charged by other's goods makes i-th agent to raise the price of i-th good. Pricing decision are said to be *strategic substitutes* if, after an increase in prices of other's goods, agent i-th decides to lower the price of its goods.

In order to obtain strategic complementarity, Woodford (2002) shows that it is necessary to have an high level of elasticity of substitution across differentiated goods together with an high level of intertemporal elasticity of substitution

across goods[2], σ. On the other hand, the presence of strategic substitutability explains why in some papers (an example is Ohanian, Stockman and Killian, 1995), monetary policy has scarce effects on aggregate activity.

3.1. Information and sticky prices. Overall, the models considered so far in this literature suffer of a serious shortcoming in designing nominal rigidities: they do not properly take into account the role of the informational factors. It should be reminded, in fact, that the theoretical microfoundations of the Phillips curve were mainly based on search and signal extraction problems. The recent informal evidence collected by Zbaracki et al. (2000) show that a crucial element for stickiness is the role of the costs related with the information processing. Models with nominal rigidities replicates - under specific assumptions - some qualitative facts empirically observed: small effects of fiscal and monetary policies and sluggish reaction of all the variables of the system, to a specific shock. Models based on the mechanism on nominal rigidities designed so far, should be intended as a proxy for better frameworks which should properly consider the limited information processing capability intrinsic in each agent. The main characteristic of many goods and labor markets of the more advanced economies is given by the high heterogeneity of products and labor services supplied, associated to occasional purchasers. This makes the perception of the aggregate price level a non trivial task.

In fact, in a single interval of time, each agent has limited amount of time and energy to be employed in processing a large quantity of economic information. This situation makes for each agent convenient to keep prices fixed over time. The focus here is not on the information technology available to each agent: it is the physical limit on the rate of information transfers that generates inertia.

For this reason, the model with quadratic cost of price adjustment à la Rotemberg, probably represents at best this informational processing cost. In fact, the

[2]Parameter σ can be also intended as the reciprocal of the risk-aversion coefficient.

presence of equation (1) well represents the sluggish - not fixed or predetermined - response of prices to exogenous shocks.

A shortcoming shared by all the papers collected in the volume edited by J. Taylor is the scarce attention given to wage rigidities. The reasons to incorporate also wage rigidities are at least two: (1) in order to generate the so called 'liquidity' effect; (2) to add an additional source of stickiness into the model and making it closer to the empirical evidence. The first reason has to do with the observed short-run relationships existing between nominal interest rates and monetary aggregates; after an expansionary (contractionary) monetary policy shock, the nominal rate is observed to decrease (increase). The first generation of monetary models[3], did not succed in replicating this empirical feature. Only with Kim (2000) the liquidity effect was obtained in a general equilibrium framework via a proper combination of nominal and real rigidities, with wage rigidities modelled with quadratic cost of wage adjustments (according to menu cost approach) and real rigidities considered as cost of adjusting capital. So, only the presence of a substantial degree of sluggishness can potentially generate a set of response patterns of variables close to the empirical regularities, documented by VAR literature: the largest effect on real variables can be observed only 4-5 quarters after a shock realization.

The presence of wage rigidities is the key assumption at the core of the traditional short run Keynesian theory. However, the presence of wage stickiness only (without price rigidities) disagrees with the empirical evidence collected via VAR studies (see, for example, Sims,1998), where it is found that real wages are mildly procyclical in response to identified monetary policy disturbances. This phenomena has been recorded at least since Dunlop (1938) and Tarshis (1938), in the first organized criticism to orthodox Keynesian Theory. Thus, after an expansionary monetary policy shock, with fixed nominal wage, theory would pre-

[3] One example of this literature is, among others, Cho and Cooley (1995).

dict a reduction of real wage, due to the increase in the aggregate price level. However, the evidence collected shows that real wage is mildly procyclical, so it will tend to increase after an expansionary monetary policy shock. This indicates that sticky prices should accompany sticky wages in a careful modelling framework. The presence of sticky prices only (with flexible wages) is in contrast with the empirical evidence, because it implies a too sharp decline in real wages, after a monetary tightening.

Tractable ways of modelling wage rigidities have been proposed by Sbordone (2001), Woodford (2002) where nominal wages evolve according to a Calvo adjusting method, properly modified. An alternative way of modelling this is given by the quadratic cost of wage adjustment, as outlined in Kim (2000). This method, which is based on a proper modification of equation (1) is probably more tractable from the analytical point of view, and it gives very good analytical results.

In any case, however, it is possible to show that despite the joint operation of wage and price rigidities, much work remains to be done with respect to proper design of the kind of rigidities to be included in the model[4].

4. Monetary Policy Rules

The types of monetary policy rules here discussed fall within the class of so called 'Taylor Rules'. The Taylor Rule is a particular monetary rule which sets nominal interest rate as reacting to inflation and real output. The nominal rate included in the rule is normally the short term interest rate directly controlled by Central Bank, which, for the United States is the Federal Funds Rate.

To be more explicit, the various Taylor Rules considered in these papers can be represented as:

$$i_t = i^* + \sum_{j=1}^{T_i} \phi_{ij} \left(i_{t-j} - i^*\right) + \sum_{j=-T'_\pi}^{T_\pi} \phi_{\pi j} \left(\pi_{t-j} - \pi^*\right) + \sum_{j=-T'_y}^{T_y} \phi_{yj} \left(y_{t-j} - y^*\right) + \eta_t \quad (2)$$

[4] Other source of stickiness take into account habit formation phenomena, as in Christiano, Eichenbaum and Evans (2001).

where i_t is a measure for the nominal interest rate in period t and employed by monetary authority as instrument, π_t is the (gross) inflation rate between t and $t-1$, defined as $\pi_t = P_t/P_{t-1}$. Moreover, y_t indicates the level of output gap and η_t represents an exogenous monetary policy shock. In (2), i^*, π^* and y^* indicate the targets for nominal interest rate, inflation rate and output gap, respectively. In particular, the representation of monetary policy rule adopted in (2) encompasses both forward and backward-looking rules: T'_π (T'_y) indicates the number of forward lags for inflation rate (output gap), while T_π (T_y) is the number of backward lags for inflation rate (output gap). According to (2) nominal rate controlled by Central Bank, changes according to the past history of the inflation rate, nominal rate itself and output gap , and depends as well upon the forecasted values for the inflation rate and output.

The advantage of a rules like (2) is that they depend upon only a small number of parameters, making analyses and comparisons quite appealing under several respects.

A possible way to evaluate monetary policy rules is to test whether they deliver a determinate equilibrium or not. Indeterminacy of the rational expectations equilibrium is always non-desirable because of the presence of several forms of rigidities which create lots of additional distortions. In order to prevent an indeterminacy of the price level a desirable interest rate rule should involve a feedback from endogenous variables such as inflation and a variable related to real activity.

The benchmark model employed in almost all the literature here considered can be represented by the following equations, taken from Rotemberg and Woodford (RW, henceforth):

$$\beta E_t \widetilde{\pi}_{t+1} = \widetilde{\pi}_t - k\widetilde{y}_t \tag{3}$$

$$\sigma E_t \widetilde{\pi}_{t+1} + E_t \widetilde{y}_{t+1} = \sigma \widetilde{i}_t + \widetilde{y}_t + g_t^n \tag{4}$$

The model (3)-(4) is expressed in log-linear context, and it has to be intended as the reduced form from a more complex model including the First Order Conditions of households and firms together with their respective constraints. So, $\widetilde{\pi}_t = \pi_t - \overline{\pi}$, $\widetilde{y}_t = y_t - \overline{y}$, with $\overline{\pi}$, $\overline{y}$ steady state levels for the inflation rate and output, respectively[5]. In (3)-(4), π_t is the (log of) inflation rate, while y_t is the output gap, i_t is the nominal rate, controlled by Central Bank; g_t^n is an exogenous stochastic disturbance.

Equation (3) is the aggregate supply equation in expected inflation and is derived from price optimization from the firm's side. Parameters of the model are: β, the representative agent's discount factor, and σ, the intertemporal elasticity of substitution across goods. In particular, parameter k reflects the presence of rigidities in the model: higher k, more rigid is considered the economy. In fact, k is a function of the parameters describing the price rigidities of the model: in RW, k is a function of the frequency of price adjustment. It also possible to show that the functional form for AS (3) is similar for other methods of price adjustments, like for example, the cost of price adjustment. Equation (4) is the linearized version of the intertemporal IS equation: it relates spending decisions from private agents to interest rate levels.

The model is closed by the inclusion of a monetary policy rule on the variants of equation (2), like for example: $\widetilde{i}_t = \phi_\pi \widetilde{\pi}_t + \phi_y \widetilde{y}_t$, where nominal rate is set as reacting to inflation rate and output gap, which, given (3)-(4), are the only endogneous variables. In a model without rigidities, the presence of $\widetilde{y}_t$ in this rule can be redundant: output gap stabilization implies also inflation stabilization, and vice-versa. In fact, after solving forward AS equation (3) we get:

$$\widetilde{\pi}_t = k \sum_{j=0}^{\infty} \beta^j \widetilde{y}_{t+j} \tag{5}$$

From (5) we see that output stabilization also delivers inflation stabilization.

[5] Variables are expressed in logs.

Therefore, in what cases, do we need a mixed target for both inflation and output ? This can occur if the deviations of output from its steady state are persistent over time, as for example:

$$\widetilde{y}_t = \rho \widetilde{y}_{t-1} + \varepsilon_t \tag{6}$$

with $E(\varepsilon_t) = 0$, $Var(\varepsilon_t) = \sigma_\varepsilon^2$. By using (5) together with (6) we get:

$$\widetilde{\pi}_t = \frac{(\rho \widetilde{y}_{t-1} + \varepsilon_t)}{1 - \beta\rho} = \rho \widetilde{\pi}_{t-1} + \frac{1}{1 - \beta\rho}\varepsilon_t$$

Thus, if $\rho > 0$, a central bank should work more actively on managing the inflation rate in order to keep output at its full capacity level. The persistence in output sinthetically represented by (6) can be originated because of the presence of real rigidities. Higher is the number of real rigidities in the model, more complex will be the persistence of the inflation rate. The Taylor principle in its simplest form is expressed by setting the coefficients of policy function (**??**) equal to $\phi_\pi = 1.5$; $\phi_y = 0.5$. Of course, the adoption of a specific rule, calls for further refinements, since it turns out to be natural to ask: can we do better ?

In general, given the presence of lot of persistency in interest rate movements, another natural candidate is a rule with the presence of interest rate smoothing obtained by setting $\phi_i \neq 0$, with $T_i = 0$, in (2). This can be justified from the need to assure a smooth reaction of financial markets: smooth interest changes from monetary authority implies smooth reaction of financial markets.

In any case, all the possible articulations of monetary policy rules call several questions that should be addressed via a proper set up of modelling framework. It is then natural to ask whether the variables included in the various variants of (2) are the ones which make sense. Is it desirable to have a prompt response of interest rate of the sort described above ? If this is true, how exactly these variables should be defined ? What is the correct price index to be employed as a measure for the inflation and/or for the expected inflation ? Should we include the actual output or the output gap ? With respect to output gap, how should it

be measured ? What are the values for the coefficients of monetary policy rules that can deliver at the same time determinacy and full control of the inflation rate ?

These and other questions are at the basis of the empirical and theoretical work which stimulated this new body of literature on Monetary Policy.

5. General Comments

In general, the weak point of the models considered in this literature can be condensed in few points:

1. Scarce attention to statistical fit.
2. Welfare analysis not accurate.
3. Lack of attention to Government Budget Constraint.
4. Absence of role for capital accumulation

With respect to the first observation, many models collected in this volume claim to make extensive reference to the empirical grounds. However, scarce effort has been dedicated to test how close are the models to real data. This appears to be an important drawback, especially because the models here considered aims to be useful to provide policy recommendations. Another rudimentary attempt to be as close as possible to data is done by McCallum and Nelson: they compute the volatility of $\{y, i, \pi\}$, derived from specific assumptions on the coefficients of the monetary policy rules.

An explicit welfare analysis has been considered only by Rotemberg and Woodford (1999) (RW, henceforth) and it is based on the level of the utility of the representative agent achieved under various policy configurations. In this paper, welfare evaluations is conducted via the manipulation of the first order solution of the model (First Order Conditions and constraints). This way of computing

welfare comparisons is legitimate only under very specific assumptions which allow to get an analytic expression of the utility function. The crucial assumption under discussion is given by the optimality of the steady state around which the model is linearized in order to be solved. Under these assumptions, RW obtain an accurate Second Order welfare evaluation. In order to have a fully general welfare evaluation approach, it should be necessary to fully solve the model up to second order[6].

A third limit of the approaches taken in the present framework has to do with the way by which money is inserted into the model. In all papers collected in the Taylor volume, money is inserted as an argument of the utility function, assumed to be strongly separable. Although Feenstra (1986) has proven the equivalence between money in the utility, Cash in Advance approach, and transaction cost approach, each of these methods raises problematic economic interpretations. Money in the utility does not have a good economic appeal, because of the difficulties involved in interpreting money demand shocks, generally considered as preferences shocks. Transaction costs approach, as in Sims (1994), is probably more appealing: money demand shocks can be interpreted as transaction cost shocks.

Another serious shortcoming is represented by the lack of attention paid to the role of Government Budget Constraint. As discussed by the contributions on the Fiscal Theory of the Price Levels (see, in particular, Leeper, 1991, Sims, 1994), monetary policy cannot be considered as permanently detached from fiscal policy: a determinate equilibrium for both inflation and level of debt can be specified in and only if a fiscal policy reaction function is considered in the model.

Another drawback is given by the lack of analysis for capital accumulation. The only exception to this is given by the model by McCallum and Nelson, where an exogenous stochastic process for the investment gives the appearance of an en-

[6] See Sims (2001), and Schmitt-Grohè and Uribe (2001).

dogenous investment choice. This appears to be a serious shortcoming, especially if we think that a monetary policy rule to be effective should be able to modify expenditure decision of agents, which are affected by real interest rate. Thus, without a proper design of the intertemporal investment decision which should make real rate endogenous, it is difficult to accurately judge the performance of monetary policy rules.

On the empirical grounds, the papers collected in this volume are based on the presumption that it is possible to recover the policy behavior by identifying single equation models. In some cases, a recursive VAR model is estimated by assuming that interest rate enters the non-policy block with a lag and that all the variables entering the interest rate equation are predetermined: an OLS estimate will deliver the monetary policy reaction function. However, it has been shown (see Sims, 1999), that this approach is correct as long as the model is estimated by using post-war data, because it is widely recognized that in this period all central banks adopted truly nominal interest rate targeting rules.

These drawbacks are based on the uncritical acceptance that during 1979-1982 monetary authority changed reaction function. This is not entirely correct, because a Taylor rule model appears to unfit data only in the inter-war period. The only phenomena clearly detected during the period 1979:10-1982:12 was the bigger unpredictability of the Federal Funds Rate, if compared to the preceding and following periods. Even if point estimate show different coefficients (bigger values for the inflation targeting after 1982), this cannot be tested with certainty given the noise contained in the sub-samples. This reveals the fallacy of relying only on a single equation models to recover policy behavior, given also that fact that nominal interest rate enters many equation in a structural model.

6. Monetary Policy in Euroland with the Accession Countries

It is certainly true that the major challenge that European Central Bank is going to face is given by the enlargement. In this new context, in fact, the probability of dealing with asymmetric shocks will increase dramatically. It may happen for example, that some countries may experience deflationary pressures and other countries at the same time may experience economic booms.

It is not certain that the increase of the integration among the countries will reduce the potential for asymmetric shocks. It has to be remarked that the enlarged economic union will face more asymmetric shocks that the less integrated one. In fact some of the original members can find themselves as outliers in terms of inflation and output if compared to the average that the ECB is going to target. Therefore, those countries may find that the cost-benefit calculus of the union has become less favorable for them.

In this new framework the ECB is in trouble. The only fact that can be implemented is related with the opportunity that each countries has the necessary tools to deal with the asymmetries present in the new context.

The difficulties can be also well described when we think about the decision making process in the enlarged governing council of ECB. At the moment, the governing council has representatives of the 12 original member countries. After the enlargement the governing council will be characterized by 27 members. Each governor representing his country will have a different set of perceptions about what should be the 'desirable' inflation rate and output target. The nice aspect of this is the Governing Council will fix the interest rate that it is optimal for the system as a whole, even if each governor is concerned with the economic conditions in his country. Basically, in the decision making process the Governing Council will be forced to adopt a median voter approach and the resulting interest rate to be settled is given by that level preferred by the median voter among the 27 members.

It is possible to show (see De Grauwe, 2002) that during the past year the decision of the European Governing council has been set in order to satisfy the best interest of the Euroland as a whole. This has been true even if each member of the governing council is strongly interest in the favoring an interest rate which takes into account the needs of his (her) own country. Therefore there is not a big discrepancy between what each governor thinks to be optimal for his country and what it is optimal for the Euroland as a whole. In fact Germany, Italy, France Spain represents more than 70 per cent of the total Euroland territory: so the large countries interest turn out to be well respected y the decision of the ECB. Therefore in the original system, a consensus can be easily reached around the proposals and the final decision is rarely taken with a vote.

When the accession countries will have joined Europe the situation appears to be quite different. In fact, it is possible to imagine a set of coalitions formed by small countries and this can overcome the desired decision of bigger countries. In this new framework, it is possible that the national economic conditions in the decision making process will become important. Thus, in an enlarged Eurosystem the proposals of the ECB board can be overruled by a group of small countries which are characterized by a set of economic conditions different from the average. The conclusion of that is the interest rate decisions can be made on the basis of the economic conditions prevailing in a relatively small part of the Euroland.

To avoid this problem, it would be necessary to set up a reform in such a way the position of small countries can be taken into account according to their effective economic importance within the enlarged Euroland.

One possible solution could be to adopt the US Federal Reserve Rule: all the governors of the enlarged Euroland can participate in the deliberation of the Governing Council, but voting rights are restricted to a limited number of governors (ten) on a rotating basis.

Another possible solution can be the IMF criteria: the small countries can be

grouped together and can be represented by one governor.

We do think that the first formula (the US Fed) is respectful of the interest of the small countries because of rotation of the voting rights. On the other hand, probably the more efficient solution can be based on the a combination of both solution, allowing small countries to have a representative with voting rights on a rotating basis.

7. Concluding Remarks

In this paper we discussed several issues about critical aspects of monetary policy with a special emphasis to the challenged that ECB needs to face with the accession of new countries into the Euroland. Apart from the structural problems that the current monetary modelling framework shows, we have showed that the ECB will suffer of a problem of implementability of policies, since the enlargement could create the risk that loses its strategic position in realizing monetary policy. This can be mitigate by creating a council with different types of decision rules in the Governing Council, with the scope of mitigating the power of the small countries.

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