



EUROPEAN CENTRAL BANK

“Inflation targeting: a view from the ECB”*

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1. Introduction

What is the ultimate objective of monetary policy? What is the appropriate framework for conducting monetary policy? Central bankers and academics have been asking these critical questions for decades. This conference, in which I was honored to take part, was a milestone in this long-standing debate.

It is a fact that never before in the history of *fiat* money has there been so much consensus on the benefits of a low-inflation environment, and many central banks have achieved results consistent with this conviction. This is a tremendous achievement and one that could easily lead us to think that at last this long-standing debate has been settled once and for all.

However, I do sometimes wonder whether we are not too complacent in believing that the regime of low inflation will be with us “from here to eternity”. There is always a risk that even great achievements after a while are taken as given and that their value is only rediscovered when they are threatened to get lost. In addition, recent history should tell us that the structure of the economy changes over time in a way that is difficult to anticipate and perceive in real time. This continuous mutation makes the task of monetary policy and its implementation even more challenging. It is the intrinsic nature of the economy that makes the debate on the aims of monetary policy and its appropriate framework so difficult to settle, and I believe that this debate will continue for some time to come.

In the course of the 1990s the inflation-targeting framework for the conduct of monetary policy has become popular among central banks and academics. In this paper I will highlight some of what I think are the distinguishing features and possible pitfalls of this approach. I will then draw comparisons with the ECB’s monetary policy strategy, also in the light of the ECB’s clarification of its strategy in May 2003.

Thus, in Section 2, I would like to put the current debates on monetary policy into a historical perspective. In Section 3, I will discuss what I see as the critical aspects of the inflation-targeting approach. Section 4 outlines the ECB’s monetary policy approach and the ways in which it resembles and differs from the inflation-targeting framework. The last section concludes.

2. A historical perspective

Following the philosophy of “rules above authorities” — to paraphrase slightly the title of Henry Simon’s famous article (1936) — one strand of research wanted the behavior of central bankers to be strictly constrained by a rule for conducting monetary policy. The most prominent advocate of this was Milton Friedman and his famous *k*-percent rule. The key argument in favour of the adoption of a simple strict rule was the acknowledgment of the economists’ and central bankers’ ignorance of the exact functioning of the economy and the long and variable time lags of monetary policy. It maintains that the actors of monetary policy know too little of the actual functioning of the economy to be able to perform activist policy and their discretionary actions would only exacerbate economic fluctuations instead of smoothing them. Strict rules prevent such problems, eliminating judgmental elements in monetary policy action and avoiding activist policy.

However, during the 1960s, few central bankers were in favor of rules, mostly because the performance of discretionary monetary policy at that time had been quite satisfactory, at least in the United States, and policy-makers were increasingly confident of their ability to properly steer the performance of the economy. The 1970s marked the end of that over-confidence. In the period between the first oil shock and the early 1980s the world’s major economies experienced two recessions while inflation rose to double-digit levels. Although these events were not fully under the control of the monetary authorities, it is clear that the discretionary approach to monetary policy did make a negative contribution by not properly anchoring inflation expectations and instead allowing them to drift.¹

One of the lessons that economists learned from their experience of the 1970s was that economic agents’ expectations cannot be taken as given by policy-makers when choosing their policy action. The underlying idea is simple but path-breaking and goes back to at least Marshak (1947), although the strongest case was made by Lucas (1976). In forming their expectations and taking their actions economic agents will always try to anticipate future policy moves. This makes expectations of future policy relevant for

¹ Among others, Orphanides and Williams (2003) show how the interaction of policy errors and endogenous expectation formation contributed to stagflation in the 1970s.

today's consumption and investment decisions and creates the room for strategic interaction among economic agents, a cornerstone of which is the credibility of the policy-maker to commit to a given set of actions. In the context of monetary policy, Kydland and Prescott (1977) and Barro and Gordon (1983) proposed models where the desire of the central bank to attain an unemployment rate below the natural rate generates surprise inflation in the economy: this is the "time consistency" problem. Economic agents properly understanding the incentives of the monetary authority and its actions would thus anticipate future inflation. In equilibrium, this would end up generating the well-known "inflation bias". A superior outcome could be achieved if monetary policy authorities took into account the effect their behavior could have on economic agents' action and properly commit not to inflate. The advantage of commitment relative to discretion crucially hinges on the credibility of the monetary authority actually sticking to its promises.

From those original contributions a large strand of literature tried to devise incentive-compatible institutional schemes capable of enforcing a rule-type behavior and thus dealing with the time inconsistency problem. General consensus has emerged that a necessary prerequisite for solving the time inconsistency problem is the establishment of an independent central bank to which the management of monetary policy is then delegated. The institutional arrangement mostly adopted to enforce the commitment accepts that monetary policy should treat the natural rate of unemployment as a given, and not try to push unemployment below its natural rate.²

These results square with another finding of the 1970s, namely the absence of any long-run trade-off between unemployment and inflation. This point was stressed by Friedman in his 1977 Nobel Lecture, among others. Friedman's argument was that while it is possible to stimulate the economy in the short run by some form of monetary illusion, workers would see through the illusion in the longer run, demanding higher wages and so bringing employment back to its natural level. Every effort to permanently push employment above its natural level is therefore self-defeating.

These arguments reinforced the original criticism of discretionary monetary policy and were the final nails in the coffin of the theory of an activist monetary policy (and the

² See Walsh (1999) for a survey.

idea of a monetary policy seeking to push economic activity above its natural level). The focus of monetary policy action had to be price stability.

The awareness of the limitations of monetary policy was also coupled with a better understanding of the possible costs of inflation and the recognition that a low-inflation environment is a necessary precondition for long-run growth and an efficient allocation of resources.³

Taken together, the awareness of the cost of inflation, of the absence of a long-run trade-off between inflation and real activity, and of the relevance of the credibility problem of the monetary authority are some of the motivations underlying the widespread adoption of a culture of price stability among the central banks of the industrialized countries during the 1980s and 1990s. I have no doubt that this new culture has made an important contribution to the disinflation process that we have observed in many countries over the last two decades.⁴

The inflation experience of the 1970s and developments in the theory of monetary policy analysis over the last 20 years have made clear the importance of the monetary authority making a firm commitment. However, unlike in the debate of the 1960s it is a commitment on an objective rather than on a simple rule. Once an agreement on the objective had been reached, another critical question remained: which is the best strategy for achieving this final objective? Over the years central bankers and academics around the world have proposed a variety of strategies. Different central banks have adopted strategies which place different emphasise on the various pieces of information, or elements of their decision-making process or different aspects of their communication policies.

Inflation targeting is one of those strategies. Following the pioneering approach of the Reserve Bank of New Zealand in the early 1990s a large number of central banks have formally adopted an “inflation targeting framework” and today we can count around 20 central banks that refer to this approach. At the same time the inflation targeting framework has triggered a large amount of interesting and stimulating theoretical work as

³ For references on the theoretical and empirical literature on the cost of inflation, see Issing (2001) and Rodriguez-Palenzuela et al. (2003).

indeed this conference testifies.⁵ Looking back at the experience of those central banks there is no doubt that it has been a success. This is particularly evident in the case of countries starting from high levels of inflation. These countries needed to implement a disinflationary process, where inflation targeting served to guide inflation expectations and provide an explicit framework and direction to monetary policy. The approach has also turned out to be successful in countries with lower inflation, as, for example the positive experience of the United Kingdom, Sweden and Canada shows. In the few cases – limited to some emerging economies – where the experience has been somewhat less successful, it is quite evident that problems originated in other areas, notably, and often stemming from misguided fiscal policies.⁶

At the same time, while not adopting an inflation targeting approach, some major central banks have also achieved to maintain price stability, proving that visible success in the management of monetary policy is not only confined to inflation targeting central banks.

In the rest of this paper I will try to substantiate this claim.

3. Inflation targeting

There is a vast amount of literature on inflation targeting and the first challenge to some readers' eyes is to decide upon a proper definition. Different authors have proposed different, and in some cases conflicting, definitions.⁷

The first and broadest definition of inflation targeting is simply a monetary policy framework that accords overriding importance to the maintenance of price stability, typically defined as a low and stable rate of consumer price inflation.⁸ As pointed out in the previous section, given the broad consensus that price stability is the appropriate goal

⁴ Citing the words of an other member of this panel: "A number of factors have contributed to the reestablishment of price stability, but surely an essential ingredient has been the attention that the Federal Reserve has paid to long-run trends in inflation and inflation expectations since 1979." (Kohn, 2003)

⁵ For references on inflation targeting see, among the others: Bernanke et al. (1999) and Svensson (1997, 1999, 2000, 2003).

⁶ See Sims (2003) for an example that a sound fiscal policy is a pre requisite for the performance of an inflation targeting framework.

⁷ See for example the two definitions proposed by Amato and Gerlach (2002) and Svensson (2002) in the same volume of the *European Economic Review*.

⁸ Bernanke and Mishkin (1997) write (p. 97): "[Inflation targeting] is characterized, as the name suggests, by the announcement of official target ranges for the inflation rate... and by explicit acknowledgement that low and stable inflation is the overriding goal of monetary policy."

of monetary policy, the strategies pursued by most central banks, including the ECB, would fall under this loose definition. However, this definition suffers from two interrelated weaknesses. First, from the policy-making perspective, it offers no practical guidance for the conduct of monetary policy beyond identifying the primary objective. As such, its practical relevance is rather limited. Second, from a scientific perspective, the definition imposes few empirically testable restrictions on the implementation of monetary policy. As such, it does not allow inflation-targeting strategies to be distinguished from other stability-oriented strategies, and their relative merits to be evaluated. Central banks that have pursued strategies other than inflation targeting cannot be meaningfully distinguished on the basis of this definition. For example, Deutsche Bundesbank has been classified as an inflation-targeting central bank by some, despite its long adherence to an intermediate monetary targeting strategy. To put it more provocatively, by this definition all “successful” central banks are inflation targeters, while all “unsuccessful” central banks are not.

Given the problems associated with this broad definition, in the remainder of this paper I will focus on alternative, more restrictive definitions of inflation targeting. Consistent with the existing academic literature on monetary policy, such narrower definitions are typically expressed in terms of a monetary policy framework based on the adoption of a monetary policy rule in which forecasts of future inflation play a central role, either in the form of the so-called instrument rules or of target rules.

An instrument rule expresses the monetary policy instrument – usually a short-term nominal interest rate – as a simple and usually linear function of deviation of a few key macroeconomic variables, generally inflation and the output gap, from their target levels. Usually the literature distinguishes between an outcome-based rule, if the instrument is a function of currently observable variables (as in Taylor, 1993), and a forecast-based rule if the instrument is an explicit function of the current forecast for key variables in the future.

Under a target rule, the appropriate setting for the monetary policy instrument is defined implicitly as the solution to an optimization problem facing the central bank. This optimization problem is defined by two elements: first, an explicit loss function describing the costs associated with deviations of specific goal variable(s) from their

target levels; and, second, a structural model of the economy. Minimization of the loss function subject to the constraints imposed by the economy's structure (as captured by the model) implicitly defines a model-specific optimal interest rate reaction function, which determines the interest rate as a function of all relevant state variables. In this context, an inflation-targeting framework is characterized by the adoption of a loss function which focuses on the deviations of forecast inflation from a target level⁹

There is a natural complementarity between instrument and target rule characterizations of inflation targeting. A target rule implicitly defines an instrument rule – albeit typically one that is complex and therefore difficult to use in presenting policy decisions to the public. Similarly, it is usually possible to derive a loss function and an economic model that would broadly support a specific instrument rule as the solution to an optimization problem facing the central bank.

Here, I do not want to enter the vast debate on the different definitions and choice between instrument and target rules.¹⁰ Nor will I address many of the problematic issues identified by the literature and associated with the adoption of those rules, such as: the indeterminacy of equilibria, the issue of commitment to the rules and the important aspect concerning the measurement of key variables, for example, the output gap.¹¹ Instead what I wish to discuss here are two more practical pitfalls associated with the narrower definition of inflation targeting, namely the central role of macroeconomic forecast in inflation targeting, on the one hand, and the robustness of the rules in view of the possible presence of model misspecifications, on the other.

Information content and forecasts

As pointed out above, simple outcome-based instrument rules constrain the central bank to respond only to developments in observed inflation and the output gap, and thus not to make use of other available evidence about the state of the economy. However, it is

⁹ This definition corresponds to what is now usually labeled as “strict inflation targeting”. In “flexible inflation targeting”, on the other hand, the loss function of the monetary authority focuses on both deviations of inflation and output from their targets.

¹⁰ McCallum (2001b) adds the following disclaimer: “... In fact, I believe that my terminology is more consistent with actual practice, in part because actual central banks have thus far not adopted explicit loss functions. In any event, the issue is of little importance, especially since it is always possible to write instrument rules that approximate as closely as desired the instrument settings of a policy regime involving targeting in Svensson's sense.”

¹¹ See Benhabib et al. (2001), Svensson (2003) and Svensson and Woodford (2003).

widely recognized that an efficient monetary policy should exploit all relevant information. By imposing an arbitrary partition on the data, simple instrument rules do not adopt such a full information approach. This raises the issue of whether those rules can be incentive-compatible. If a central bank is aware of information suggesting that the interest rate implied by the rule might be inappropriate (e.g. because of weakness in the financial system), it would have an incentive to deviate from the rule. Given the incentive for such deviations, it is questionable whether central banks would follow such a rule and thus whether the ex ante commitment to this rule can be credible. However, if the rule lacked credibility, it is unlikely to help stabilize private inflation and interest rate expectations.

Forecast-based rules partially overcome the information restrictions imposed by outcome-based Taylor-like rules making the instrument responding to expectations of future inflation and the output gap. To quote Batini and Haldane, (1997): “expected inflation ought to embody all information contained within the myriad indicators that affect the future path of inflation.” Along the same lines, Clarida et al. (2000) characterize forecast-based rules as making use of “a broad array of information (beyond lagged inflation and output) to form beliefs about the future condition of the economy, a feature that we find highly realistic.”

However, this opens the door to the problem of the complexity of the construction and nature of the forecast. For example, which is the proper model to forecast? What is the proper way of treating the central bank’s monetary policy responses in the future projection or of using market participants’ forecasts?¹² Instead of tackling these issues, let me focus on another main critique by challenging the view that forecasts, particularly inflation forecasts, are sufficient statistics on the state of the economy and for monetary policy.

To exemplify, let us begin by assuming that the only objective of policy is to maintain price stability. If prices move in tandem with the existing tension on employable resources, the policy goal of price stability dictates keeping the economy continuously close to its potential. Under these circumstances, reacting to a pure inflation forecast

¹² See Bernanke and Woodford (1997) for an exposition of the circularity problem induced by monetary policy mechanically responding to private inflation forecasts.

figure, with no reference to any additional indicator of macroeconomic performance, would be a recipe for policy mismanagement any time the economy is hit by a transitory (say, favorable) supply shock. This type of shock would entail both a downward blip in forecast inflation and an upward movement of output away from its sustainable level. Hence, restricting the central bank's information set solely to the inflation forecast figure – to the exclusion of a broader suite of other indicators, which help discriminate between supply and demand shocks – would, in this situation, call for an easing policy today, which could destabilize the economy by laying the ground for the build-up of inflationary pressures tomorrow.

This is an elementary example of the general proposition that inflation forecasts alone are not sufficient to reveal the nature of the threat to price stability and that it would therefore be misleading to follow a rule that requires setting the policy instrument simply as the function of a forecast. Even in an ideal world in which the models producing the forecast are properly specified, the policy-makers are not interested in the result of the forecast per se but instead aim at a consistent economic picture or, to put it differently, they aim at identifying the relevant shocks underlying the forecasts and how different types of disturbances to the economy imply different kind of policy responses. The relation between forecasts and underlying shocks is clearly one-to-one in many simple stylized models utilized in monetary policy literature, but this relation clearly breaks down once we depart from that simple set-up. So once again, forecasts of a few macrovariables cannot be sufficient as statistics to determine monetary policy action.

Target rules are somehow immune from the above problem given that they are routinely implemented by producing forecasts of future inflation and output conditional on the path of the policy instrument and searching for the path, which minimizes a proper loss function. Consequently, when evaluating inflation targeting in the context of target rules, the discussion should primarily focus on the structural model used to define the central bank's constrained optimization problem. In other words, an evaluation of the target rule characterization of inflation targeting is largely equivalent to an evaluation of the economic model employed to derive that rule.¹³ One criticism of the models

¹³ While Svensson (2003) says on p. 450: “[Forecast targeting]... does not imply that forecasts must be exclusively model-based”, I would not tackle the slippery issue of the use of judgmental information in the forecasting process.

underlying most target rule characterizations of inflation targeting is that they neglect any role that might be played by the monetary aggregate or financial frictions in the determination of price developments. This opens the way to a second set of remarks on the issue of model misspecification and the robustness of the rules.

Robustness and model misspecification

The possible presence of model misspecification is something that economists and econometricians have some difficulty in acknowledging. However, every model we write down and estimate, contains some form of shortcut and approximation. This uncertainty is worsened since economists have not yet agreed upon a proper, commonly accepted approximating model. This implies that the appropriateness of a monetary policy strategy cannot be evaluated only within a particular class of models – rather a good strategy has to perform well across a variety of empirically plausible models.

However, most advocates of inflation targeting – at least those referring to simple rules for monetary policy decisions – ultimately rely on a view of the economy whose essence can be captured by no more than three equations. The defining characteristics of these equations are: staggered pricing; the centrality of the output gap (or Phillips curve); and, the notion that monetary impulses propagate primarily via a price (interest rate) channel, with monetary quantities playing no role.

The presence of only a market for goods and the absence of a fully formalized market for assets whose supply is inelastic in the short run implies that money has no role other than to facilitate the exchange of goods. Decisions about money holdings are not seen as part of a wider portfolio decision that – at times – may lead households to prefer liquidity over risky assets. For example, a positive change in money demand has no counterpart in an excess supply of some other asset. On the contrary, if truly alternative assets were to exist whose issuance were related to their private issuers' investment decisions and capital formation, then generating a higher (or lower) supply of money – at any given interest rate – could become all but inconsequential.

Quoting McCallum (2001a), there is “nothing fundamentally misguided” about the model used by advocates of inflation targeting. Such a model is internally consistent and elegant. It can also mimic the observed behavior of modern economies in “normal”

circumstances. Yet it rests upon what can certainly be regarded as extreme assumptions about the role of money in the economy. A central bank can legitimately question the usefulness of a model for monetary policy-setting in which money has been deprived of its basic liquidity – or, equivalently, its “store-of-value” – function that generations of scholars have recognized and discussed for decades (cf. Hahn, 1990, *inter alia*).

Levin et al. (1999, 2001) demonstrate that Taylor-like instrument rules perform quite robustly in a particular set of macroeconomic models. However, this robustness does not survive a broadening of the suite of candidate models beyond those considered in these papers. Suitably parameterized Taylor-like rules appear to work well in stabilising the economy within the confines of the mainstream New Keynesian paradigm, in which money market equilibrium conditions are redundant. This last assumption, in particular, proves to be absolutely crucial. If financial markets are not free of frictions, then Taylor-like rules often do not prove to be robust and yield sub-optimal outcomes.

Examples of financial market frictions are prominent in transmission mechanism literature, e.g. in so-called limited participation models (Christiano and Eichenbaum, 1992) or segmented markets models (Alvarez et al., 2001). Within the class of limited participation models, Christiano and Gust (1998) show that the set of parameters under which a Taylor-like inflation-targeting rule becomes a source of instability is much broader than for mainstream New Keynesian models.

More recently, Alvarez et al. (2001) presented some experiments on the stabilization properties of simple Taylor rules within a segmented financial markets model. They conclude that central banks pursuing a Taylor-like interest rate instrument rule – by systematically ignoring money market (velocity) shocks – censor the information set available to policy-makers and thereby reduce the effectiveness of their responses to economic shocks by arbitrarily excluding relevant monetary information from the policy decision. In a similar vein, but in a different class of model, Christiano and Rostagno (2001) show that a Taylor-like interest rate instrument rule can generate equilibria with undesirable properties; this outcome could be avoided by a policy rule that takes into account the information provided by monetary aggregates.

It should be clear that, from the view point of a central bank, a serious attempt should be made to construct a model where shocks to velocity are treated appropriately within

the context of broader portfolio shifts, possibly in the presence of (changing) risk assessments. Unless disturbances in money holdings are formalized in such a way as to reflect financial decisions, then nothing can be said about the role of money in the business cycle, and insufficient policy advice can be drawn from analyses of models that do not properly tackle these problems.

4. The ECB's monetary policy strategy

Let me now turn to the ECB's monetary policy strategy. The ECB started to conduct policy in 1999 with the inception of the euro. While taking stock of the experience of the central banks of the Eurosystem, the ECB was at the time facing a major institutional change. Eleven national¹⁴ economies merged into a unified market almost overnight; in this context, past experience and data might turn out not to be particularly informative with regard to the new economic structure.

In the presence of such Knightian uncertainty, in October 1998 the Governing Council of the ECB announced its monetary policy strategy. The designed strategy was a novel one, suited to the special and still partially unknown characteristics of the euro area, and different in a number of respects from other current and past strategies.

Three aspects of the ECB strategy are critical. First, its focus on the price stability objective. Price stability is enshrined in the Treaty on European Union as being the primary objective of the ECB. The ECB Governing Council therefore provided a quantitative definition of price stability as a year-on-year increase of the Harmonized Index of Consumer Prices (HICP) below 2%.¹⁵ A second, closely related element, is the medium-term orientation of our policy. Central banks can only affect the price level with "long and uncertain lags"; consequently they cannot be over-ambitious and try to steer price developments in the short run, nor should they seek to precisely define the horizon of their action. Moreover they need to respond gradually to economic shocks, taking output fluctuations into account. A third element of the strategy relates to the analyses and economic perspectives that ultimately guide policy decisions. The strategy recognizes the need for a comprehensive analysis of economic and financial shocks and

¹⁴ Twelve from January 2001 when also Greece adopted the euro.

¹⁵ See Issing et al. (2001) and ECB (2001) for a detailed description of the ECB's monetary policy strategy.

dynamics but, at the same time, it attaches a privileged role to indicators based on monetary aggregates. This organization of the information has been labeled the “two-pillar” strategy of the ECB. The ECB’s monetary policy strategy was meant to provide a transparent and consistent conceptual framework: structuring the internal analysis of the economic situation and risks to price stability, facilitating the decision-making process in the Governing Council, and communicating policy decisions to the public at large.

In almost five years of experience with the ECB monetary policy, the strategy has served all these functions to a high level of satisfaction. The ECB has pursued its mandate of maintaining price stability with vigor and determination, gaining a high level of credibility from the outset. This achievement is all the more remarkable given that the ECB started without a track record and in an uncertain environment. Testifying to this success, inflation expectations, as measured by survey data and by financial market indicators, have remained consistent with our definition of price stability.¹⁶

In December 2002 the ECB announced the decision to conduct a comprehensive review of its strategy. This decision was sometimes wrongly interpreted by observers as an implicit indication of dissatisfaction with the strategy. In fact, the opposite was true. To ensure the continued satisfactory development of the strategy in a complex and changing environment, it was only natural that, after more than four years of experience, the ECB Governing Council would want to look back and reflect in a systematic way on past experience. The outcome of the strategy review was made public on 8 May 2003 and it aimed primarily at addressing certain misunderstandings that have emerged in our communication with the public.¹⁷

Regarding the definition of price stability, the Governing Council confirmed the explicit quantitative definition announced back in October 1998. However, in continuing with the past conduct of monetary policy, the Governing Council clarified that in the pursuit of price stability it will aim to maintain inflation rates below, but close to 2% over the medium term. This clarification emphasizes the need for a sufficient safety margin against the risk of deflation and at the same time is also sufficient to cover the potential

¹⁶ See the evidence provided in Castelnuovo et al. (2003).

¹⁷ The outcome of the strategy review and the background documents can be found at www.ecb.int.

presence of a measurement bias in the HICP and the implications of inflation differentials of a structural nature within the euro area.

Regarding the role of money in the strategy framework, the Governing Council confirmed that the strategy's two-pillar framework is an effective tool for organizing the information used to assess the risks to price stability. As discussed in the previous section, the economic literature confirms that integrating the analysis of monetary aggregates with the analysis of conditions on the goods and labor markets in a unified model remains an elusive challenge. Different types of analysis provide information relevant for price developments at different time horizons. What we labelled as economic analysis focuses on the most proximate causes of inflation, such as cost developments and demand-supply imbalances, and primarily contributes to the assessment of short to medium-term economic dynamics and the risks to price stability at that horizon. Monetary analysis, on the other hand, focuses instead on the ultimate monetary determinants of inflation, and primarily contains information for assessing price trends at medium to long-term horizons. The Governing Council clarified that the monetary analysis mainly serves as a means of cross-checking, from a medium to long-term perspective, the short to medium-term indications coming from the economic analysis.

Let me emphasize the role of the cross-checking. All the information coming from different sources, such as short-term conjunctural indicators, quarterly macroeconomic forecasts, the analysis of asset prices and monetary aggregates, have to be compared and properly evaluated in order to come to an overall assessment of the monetary policy stance. This ensures that, while responding to economic shocks as they manifest themselves, we do not lose sight of the fact that, in the longer term, developments in money need to be consistent with our objective. This helps, in my view, to give a sense of direction and impart a steady course to the conduct of monetary policy.

The Eurosystem staff macroeconomic projections¹⁸ are one important input into the monetary policy decision as a way of organizing a large amount of information and

¹⁸ See ECB (2001b) for a description of the Eurosystem staff macroeconomic projection exercise. Within our framework, we clearly separate the production of projections, as carried out under the responsibility of the staff, from the monetary policy decisions taken under the responsibility of the Governing Council in order to avoid any ambiguity between the assumptions of the projections and the policy implications.

helping to create a consistent picture of possible future developments, but without making them the sole input for the conduct of monetary policy. As discussed in the previous section, forecasts cannot be per se a sufficient statistic for policy, nor can they contain all relevant information, not least because the models underlying the forecast are inevitably misspecified to some extent.

There are instances that standard macroeconomic models, which by definition are constructed to replicate normal conditions and regularities in the economy, are unable to capture and incorporate. This is particularly the case when large shocks or special circumstances arise, such as episodes of financial instability or asset price bubbles, are involved. I am merely recalling the developments over the last two to three years, when we faced exceptional uncertainties and major stock market movements followed by large portfolio adjustment. How those past events can be squared with forecasts of inflation and output based on models in which financial assets do not play any active role is still an open issue both for central bankers and academics. In such occasions the need of careful judgement, of a broadening of the horizon for the conduct of policy and of the consideration of non-standard indicators and different interpretations of the evidence become especially relevant.¹⁹

Of course this does not mean that the ECB does not make full use of models. On the contrary, the ECB devotes a lot of time and resources to improving the set of economic models that are utilized in-house in order to gain a better understanding of the euro area economy and provide better guidance for the monetary policy decision-making. Like many other central banks we do use quite a large menu of models ranging from simple time series models useful in short-term forecasting up to medium-size structural macroeconometric models in both area-wide and multi-country specification.²⁰ Compared with purely time series or reduced-form models, structural models have the advantage of having a well-specified conceptual framework (or a set of identification assumptions) that help to provide some better economic interpretation of the results, i.e. “the story behind the numbers”. Moreover, considerable effort has recently been devoted to the development of “state-of-the-art” medium-sized stochastic dynamic general equilibrium

¹⁹ See Issing (2002) for a discussion on the usefulness of information stemming from monetary aggregates in revisiting some historical episodes of financial instability.

²⁰ See Fagan, Henry and Mestre (2001) for a description of the area-wide model of the euro area.

models (SDGE) where the estimated specification is fully micro-funded and consistent with the solution of the optimization problem of economic agents. Those models have proved to combine a solid theoretical grounding with a good ability to replicate many relevant features of the euro area data. Smets and Wouters (2003) proposed an extended version of the standard New Keynesian SDGE closed-economy model with sticky prices and wages. Christiano, Motto and Rostagno (2003) substantially extended a stylized real-sector SDGE model to include a fully formalized financial sector where the issuance of assets is related to firms' need to finance entrepreneurial activity, although there are frictions in the activity of the intermediaries related to the cost paid to monitor firms.

As a central banker but also as an academic I am looking forward to the results of this line of research given that it provides macro models with both a solid micro-foundation and good empirical properties, and with the potential to bring into the picture phenomena of a monetary and financial nature that are often left out of the more commonly used macro models.

5. Conclusion

Let me end by saying that in practice probably no central bank follows the strict characterization of inflation targeting and that differences in the practices of central banks oriented to price stability should not be exaggerated. Most of the central banks oriented to price stability share a number of key elements that guide the conduct of their monetary policy, namely a clear, quantitative definition of the overriding objective, a forward-looking orientation of their policy, and the awareness of the need to take a broad range of information into account and to communicate with the public in a clear and transparent manner.

There is no clear-cut evidence to suggest that generally, and according to some well specified criteria, one specific framework should be preferred to all others.²¹ Take, for example, one crucial measure of our success as central bankers: the ability to firmly anchor long-term inflation expectations. These appear to be well anchored, in terms of the very low volatility of expectations as well as the very low correlation with actual

²¹ See Ball and Sheridan (2003) for a comparative analysis of the macroeconomic performance of countries adopting an inflation-targeting framework.

inflation developments, in most industrialized countries or currency areas, including those where central banks do not usually consider themselves to be “inflation targeters”, such as the United States and the euro area. This to me is just a confirmation of something that I always believed: namely that there is no “single” or “best” way to conduct monetary policy-making, and that different approaches or frameworks can lead to successful policies and/or be better adapted to different institutional, economic and social environments.

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