2001

Defining a Macroeconomic Framework for the Euro Area

MONITORING THE EUROPEAN CENTRAL BANK 3

Alberto Alesina Olivier Blanchard Jordi Galí
Francesco Giavazzi Harald Uhlig

MECB3

The research underlying this publication was supported by
Citibank, a member of Citigroup • MPS Finance Banca Mobiliare SpA & Gruppo Monte Paschi Asset Management SGR

Defining a Macroeconomic Framework for the Euro Area

Monitoring the European Central Bank 3

Centre for Economic Policy Research

The Centre for Economic Policy Research is a network of over 500 Research Fellows and Affiliates, based primarily in European universities. The Centre coordinates the research activities of its Fellows and Affiliates and communicates the results to the public and private sectors. CEPR is an entrepreneur, developing research initiatives with the producers, consumers and sponsors of research. Established in 1983, CEPR is a European economics research organization with uniquely wide-ranging scope and activities.

CEPR is a registered educational charity. Institutional (core) finance for the Centre is provided by major grants from the Economic and Social Research Council, under which an ESRC Resource Centre operates within CEPR; the Esmée Fairbairn Charitable Trust and the Bank of England. The Centre is also supported by the European Central Bank; the Bank for International Settlements; the European Investment Bank; 23 national central banks and 41 companies. None of these organizations gives prior review to the Centre's publications, nor do they necessarily endorse the views expressed therein.

The Centre is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions. CEPR research may include views on policy, but the Executive Committee of the Centre does not give prior review to its publications, and the Centre takes no institutional policy positions. The opinions expressed in this report are those of the authors and not those of the Centre for Economic Policy Research.

Centre for Economic Policy Research
90–98 Goswell Road
London EC1V 7RR
UK
Tel: (44 20) 7878 2900 Fax: (44 20) 7878 2999
Email: cepr@cepr.org Website: www.cepr.org

Defining a Macroeconomic Framework for the Euro Area

Monitoring the European Central Bank 3

Alberto Alesina
Harvard University and CEPR

Olivier Blanchard
Massachusetts Institute of Technology

Jordi Galí
Universitat Pompeu Fabra, Barcelona, and CEPR

Francesco Giavazzi
Università Bocconi, Milano, and CEPR

Harald Uhlig
Humboldt Universität zu Berlin and CEPR

The research underlying this publication was supported by Citibank, a member of Citigroup, MPS Finance Banca Mobiliare SpA, and Gruppo Monte Paschi Asset Management SGR. The opinions expressed in this report are, however, those of the authors. Neither CEPR, Citibank, MPS Finance Banca Mobiliare, nor Gruppo Monte Paschi Asset Management take any institutional policy positions.

Centre for Economic Policy Research
90–98 Goswell Road
London EC1V 7RR
UK

Tel: (44 20) 7878 2900
Fax: (44 20) 7878 2999
Email: cepr@cepr.org

Website: www.cepr.org

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 1 898128 59 6

Printed and bound in the UK by Information Press, Oxford

Contents

MECB Statement of Purpose

Europe has a new central bank. It must develop its version of accountability and public debate over monetary policies. It is natural for CEPR, as a network of policy-oriented academic economists, to contribute to the establishment of a new tradition. *Monitoring the European Central Bank (MECB)*, brings together a group of economists internationally known for their work on macroeconomics and monetary policy. *MECB* will monitor the European economy and the work of the ECB. Its analyses will be presented to the broader public, including the European Parliament and the media. A full *MECB* report is published each year complemented by an update that draws on recent publications of the ECB.

MECB acknowledges the financial support of Citibank, a member of Citigroup, MPS Finance Banca Mobiliare SpA, and Gruppo Monte Paschi Asset Management SGR.

MECB Steering Committee Members

List of Figures

List of Tables

List of Boxes

Acknowledgements

We thank the authors of previous *MECB* Reports, and in particular Paul De Grauwe, Carlo Favero and Charles Wyplosz for their advice. Richard Portes, Albert Satorra and Guido Tabellini also provided useful comments. Irma Clots, Amelie Mahlstedt and Fabio Milani were our excellent research assistants.

Foreword

As the European Central Bank enters its third year, it is essential that we continue to assess and challenge the performance of this institution that plays a key role in Europe and in the international financial system. The CEPR *Monitoring the European Central Bank* team has an independent pan-European perspective and brings the solid research of distinguished economists to bear on the issues facing the Bank, while retaining the incisive edge of a more policy-oriented outlook.

The third report identifies two key issues that, the authors argue, define the macroeconomic framework of the euro area: fiscal policy coordination and the adjustment mechanism in monetary union. The report also explores how the ECB sets interest rates and assesses the developments in the first two years of the ECB. This report offers specific proposals for policy-makers (both inside and outside the Bank) to consider.

As for all CEPR publications, the views expressed here are those of the authors writing in their personal capacity. Their opinions are entirely independent from CEPR and from the funders, Citibank, a member of Citigroup, MPS Finance Banca Mobiliare SpA, and Gruppo Monte Paschi Asset Management SGR.

Thanks go to the CEPR staff members whose hard work and professionalism have ensured the successful execution of this project, and in particular to CEPR's Publications Manager, Lisa Moss, as well as to Linda Machin.

RICHARD PORTES
12 March 2001

Executive Summary

Inflation targeting: an 'employment-friendly' monetary strategy

Targeting inflation is very close to what the ECB has been doing – regardless of the rhetoric – and to what it should be doing.

Inflation targeting, however, is often misunderstood. Some consider it an arcane, technical aspect of central banking with little real world relevance. For others, inflation targeting is the extreme form of monetarism, a way of running monetary policy that gives zero weight to output and employment. Both views are incorrect.

Inflation targeting is, in essence, a way of setting monetary policy in order to keep output close to potential, wherever potential output happens to be, while keeping inflation close to its target.

The Bank, therefore, need not worry about the output gap, which is anyway very hard to measure. The change in inflation is a sufficient indicator for deciding when interest rates should be changed. In sum, inflation targeting is simply a very good idea!

The ECB should thus abandon its 'two pillars' strategy and adopt a simple inflation targeting rule. Keeping inflation in check is the ultimate goal of the ECB. It is hard to see why the growth rate of M3 should have a special role which goes beyond that accorded to many other indicators. The M3 pillar increasingly stands in the way of an effective communication strategy.

Should Ecofin and the ECB 'coordinate'?

Monetary and fiscal policies in Europe are set independently. Is this a problem? Is there a need for an explicit coordination of monetary and fiscal policies in EMU?

Our answer is no. If the monetary and fiscal authorities 'keep

their houses in order' acting on their own, there is no need for explicit coordination. If the fiscal authorities deviate from prudent fiscal policies because of a variety of short-run political incentives and constraints, then explicit coordination may even be counterproductive.

Formal meetings between the monetary and fiscal authorities designed to coordinate policies are either unnecessary or harmful. Informal meetings may be a useful channel of information exchange. The benefits of this exchange of information must, however, be weighed against the possibility that the meetings may be turned, by the fiscal authorities, into occasions for pressuring the ECB.

The ECB does not follow a strict inflation targeting rule. Its strategy is more elaborate and involves two pillars – inflation and money growth. Does this justify coordination with fiscal authorities? The answer is, again, no. The fact that ECB policies leave room for discretion, makes coordination on balance even less desirable, since the fiscal authorities may have more room to manoeuvre in putting pressure on the ECB. In fact, any degree of uncertainty about the response of monetary policy to a move by the fiscal authorities justifies their call for taking decisions jointly, i.e. for formal coordination. We see this as an important argument for a clear monetary policy strategy based on inflation targeting.

What about national fiscal authorities? Should the 12 finance ministers coordinate their policies? If it was certain that fiscal policy decisions in each country were shielded from short-term political incentives, coordination would certainly make sense. Coordination could, however, lower the political cost of incorrect policy actions, thus making them more attractive.

Should the ECB worry about inflation differentials among EMU members?

Our answer is that inflation differentials should not be demonized. In a common currency area inflation differentials are the mechanism for adjusting real exchange rates, when adjustment is needed. For a country belonging to a currency union, having higher inflation than the average may thus be entirely appropriate.

After convincing citizens that inflation was bad, governments and the ECB must now go to step two and explain that temporary inflation differentials can be desirable, leading to higher real income and the proper macroeconomic adjustment.

The current situation in Ireland provides a first testing ground. Ireland can clearly sustain a high growth rate for the foreseeable future, but not quite the current growth rate. The Irish economy is now above its sustainable level of activity, and thus should slow down. What form should the adjustment take?

Given the fast growth and strong investment demand, the appropriate current account position for Ireland may well be a deficit and a reliance on world saving. This points to the adjustment occurring through a reduction of external demand, and thus through inflation and real exchange rate appreciation. In other words, the Irish economy should be slowed down by increasing the relative price of Irish goods, and thus by raising the real income of the Irish people.

Ireland has a large budget surplus: at this moment an even larger surplus may not be necessary. Indeed, there is a case for using part of the surplus to finance public investment, to keep public infrastructure in line with a rapidly growing economy.

This is not, however, the case in Spain, another EMU member with higher than average inflation. The Spanish current account deficit is large, and getting larger. In contrast to Ireland, however, it is not matched by high investment and high productivity growth. Spain provides a clear case for slowing down the economy through the use of fiscal policy, rather than through a real appreciation and an increase in the current account deficit.

How does the ECB make interest rate decisions?

The interest rate decisions made over the past two years appear to be best described by a 'hybrid rule' – the ECB sets interest rates responding quite aggressively to both core inflation and the inflation forecast.

The behaviour of core inflation accounts for the loosening of monetary policy in the middle of 1999, when core inflation was falling. The behaviour of expected inflation helps to explain the relatively modest interest rate increases since November 1999 in face of rapidly rising inflation.

In December 2000 headline inflation was 2.6%. Does this imply that the ECB faces a credibility problem?

The Bank has missed its pre-announced target range of 0–2%. Indeed, the ECB judges annual HICP inflation rates to be likely to remain above 2% for some time to come, even with a decline in oil prices.

Our finding that the behaviour of the ECB can be described by a rule that responds to both core inflation and the inflation forecast suggests that the current high rate of inflation, relative to target, is justifiable because of an expectation of lower inflation in the near future. Core inflation is currently around 1.5%, and the inflation forecast for the year 2001 lies inside the ECB target range.

The ECB has shown, overall, good judgment in its actions. If there is a problem, this arises from comparing what it says with what it does. The insistence on the 'two-pillar strategy,' the

initial reluctance to publish its own inflation forecast, and a somewhat vague notion of what the 'medium term' is, have not helped to make it easy to understand the ECB strategy.

Should the ECB have been stricter in fighting inflation? Amongst some politicians and part of the public the Bank has a reputation of being excessively concerned about inflation and not sufficiently worried about unemployment. This is not consistent with the evidence. If anything, the ECB has shown a certain amount of flexibility in interpreting its mandate of price stability.

Should the ECB worry about the exchange rate of the euro?

The ECB should encourage a cooling of the exchange rate obsession of Europeans. For some reason, the public seems to believe that the success of the euro can be measured by its value *vis-à-vis* the dollar. Explaining to the public that a successful currency is one that produces low inflation, not one that produces high exchange rates, is a good strategy.

Achieving a low inflation rate, however, does not mean that the ECB should ignore the exchange rate. The exchange rate obviously does have an impact on inflation via imports and exports. In judging inflationary pressure the ECB must therefore take the exchange rate into account.

Are the inflation projections now published by the ECB a good idea – and are they done right?

The ECB has decided to publish projections for inflation and other variables relevant for assessing monetary policy developments. We strongly applaud this development.

The ECB constructs these projections under the assumption that it will not change interest rates for, say, a year. This, however, nobody believes will happen, except in very special circumstances. The inflation projection published by the ECB is not, therefore, the forecast that the public will use in forming their expectations. It shows zero uncertainty with regard to interest rates, and lots of uncertainty with regard to inflation. The truth, however, will be precisely the opposite.

For reasons of logical consistency, as well as for showing the interesting dimensions of uncertainty, the ECB should produce forecasts using the predicted paths of interest rates, given the actual ECB policy of trying to keep inflation in check. Inflation and interest rate forecasts using actual ECB policy – that means allowing for interest rates to change along the forecast – should become the main anchor of monetary policy.

1 Introduction

As it enters 2001 and its third year, the ECB faces two main challenges:

- What attitude to take *vis-à-vis* the EMU fiscal authorities, and whether or not to volunteer to participate in policy coordination exercises? This issue has come to the forefront after Nice, since the Treaty provides a new institutional framework which could allow the 'coordination' between monetary and fiscal policy inside EMU.

- How to deal with the widening inflation differentials between high-growth countries, Ireland and Spain in particular, and the core of EMU? Should inflation differentials be a cause of concern, and if so, which are the policy tools best suited to address the problem? Or should the ECB overlook the dispersion of inflation rates among EMU members and simply concentrate on euro area averages? More generally, how should the adjustment mechanism work inside a monetary union?

This report starts from a discussion of these two questions that define the macroeconomic framework of the euro area. The attitude the ECB will take *vis-à-vis* these questions will affect its reputation and the macroeconomic performance of the euro area in the years to come.

The year 2000 has, of course, doubled the amount of information at our disposal to learn how the ECB operates. The track record begins to be long enough to try to uncover some underlying patterns in the way the ECB sets interest rates. In other words, have ECB interest rate decisions since the beginning of EMU been consistent with its stated strategy? This is the third topic discussed in the report.

Looking back, how do we assess the performance of the ECB in the year 2000? The key measuring stick is inflation, and the

bank has missed its pre-announced target range of zero to 2%. Inflation stood at 2.6% last December. Indeed, the ECB judges annual HICP (Harmonized Index of Consumer Prices in the euro area) inflation rates to be likely to remain above 2% for some time to come, even with a decline in oil prices. The exchange rate of the euro has made daily news throughout the year, reaching a bottom of $0.83 per euro in September, then recovering rapidly. Should the public be worried about these developments? Or is this just normal turbulence in the life of a well-functioning central bank?

Finally, we comment on the inflation projections published by the ECB since December 2000, and which will play an increasingly important role in the formulation of its policy. While we applaud this development, we also point out that the projections should be based on realistic paths for interest rates, rather than on the counterfactual no-change-in-interest-rates assumption.

The report is organised as follows. Chapter 2 discusses policy coordination; Chapter 3 the the adjustment mechanism in a monetary union; Chapter 4 investigates how the ECB sets interest rates; Chapter 5 assesses developments in the first two years of the life of the ECB.

Inflation targeting: an 'employment-friendly' monetary rule

Throughout this report we argue that targeting inflation is very close to what the ECB has been doing — regardless of the rhetoric — and to what it should be doing. Before starting it is, therefore, useful to review what targeting inflation means and, importantly, what is the relationship between this monetary policy rule and the real variables of output and employment.

While increasingly in fashion with central banks, inflation targeting is often misunderstood. Some consider it an arcane, technical aspect of central banking with little real-world relevance; for others, inflation targeting is the extreme form of 'monetarism,' a way of running monetary policy that gives zero weight to output and employment. Both views are incorrect. Inflation targeting is, in essence, a way of setting monetary policy so as to keep output close to potential, wherever potential output happens to be, while keeping inflation close to its target.

To see this, consider the following equation that most economists find quite useful and which is predicted by a number of theories on price and wage setting (for a slightly more thorough discussion see Box 1.1). Write π_t for the inflation rate, y_t for current output, and y_t^* for potential output (which is not constant over time, hence the time subscript). The equation describes how the deviation of output from potential puts pressure on inflation:

$$\pi_t = \pi_{t-1} + a(y_t - y_t^*) + u_t$$

a is a parameter whose value depends on the structural characteristics of the economy and describes the pressure on inflation produced by a given deviation of output from potential, and u_t is a disturbance term.

Forget about disturbances first. When inflation does not change, actual output is precisely equal to potential. Therefore, if inflation was, say, 2% in the past and, if the central bank again targets and achieves 2% inflation now through the proper use of its instruments, it simultaneously assures that output stays close to potential. It is a way of having the cake and eating it too.

A natural objection to this argument is that empirically, the relationship between changes in inflation and deviations of output from potential is rather weak (i.e. that u_t might be rather far from zero). Indeed, regressions that proxy y_t^* by some smooth version of output – call it *ybar* – typically find that the fit of the equation is rather poor (no matter how sophisticated is the technique used to construct *ybar*). In other words, regressions of π_t on π_{t-1} and $(y_t - ybar)$ lead to a large residual u_t. The larger and more persistent are these disturbances, the weaker is the relationship between changes in inflation and deviations of output from potential. In other words, if the volatility of u_t is large then inflation targeting would have little to do with keeping output close to potential.

The problem, however, with these regressions is that they are likely to mismeasure y_t^*. Many of the shocks which these regressions ascribe to the disturbance term u_t are in fact shocks to potential output – shocks to y_t^*. Box 1.1 provides the detailed argument. Think, for instance, of the effects of an increase in the bargaining power of unions. If this produces a wage push, inflation will increase, but higher real wages (assuming unchanged productivity) would also lower potential output. It is then the opening up of an output gap, induced by the fall in potential output, that raises inflation, not the shock in itself. When the central bank responds to the increase in inflation by raising interest rates, output falls, keeping close to potential, which also has fallen. This is the case of most of the shocks that people typically have in mind when thinking about u_t. These shocks influence potential output, rather than the relation between the output gap and inflation. In short, the relationship between the change in inflation and the output gap is likely to be quite close.

Two points remain. First, the central bank is unlikely to hit a particular inflation rate dead on. Suppose that inflation has inched up to 3%. Should the central bank now target 3%, at which level output would be close to potential, or should it try to get back to 2% at the risk of depressing output? There is a trade-off here and a gradual adjustment back is probably best. Second, why should it be a good idea to have a zero output gap?

Might it not be better to stimulate the economy above potential, even at the risk of creating some more inflation? The answer here is that such policies will be short-lived. After the party is over, there remains the headache of higher inflation and output back to potential. Higher output is desirable, but the only way to achieve it is by raising potential output. Monetary policy is not the right tool for that and, therefore, monetary policy should not try to achieve this.

An implication of this discussion is that the central bank need not worry about the output gap, which is indeed hard to measure since y_t^* moves around all the time: the change in inflation is a sufficient indicator for deciding when interest rates should be changed. In sum, inflation targeting is simply a very good idea.[1]

1. One can go even further. The central bank does not target current inflation, but inflation some time in the future, say one or two years down the road. What matters then is not the current value of u_t but its expectation: if the shocks represented by u_t, are really transitory then their expectation goes to zero. In this sense targeting expected inflation (using Lars Svensson's terminology – 'inflation forecasts targeting') is indeed equivalent to keeping output close to potential at some point in the not too distant future. In other words, in that case the optimal policy requires that both the output gap and inflation adjust gradually to their target levels, with the speed of adjustment depending on the relative weight of inflation and output gap volatility in the central bank's loss function. (For a formal analysis of optimal monetary policy in that context see Clarida, Galí, and Gertler, 1999).

BOX 1.1 Firms, workers and the relationship between inflation and the output gap

Consider the following simple model of the labour and goods markets. The wage- and price-setting rules are respectively:

$$w_t = p_t^e + bn_t + \varepsilon_t$$

$$p_t = w_t + cn_t + \eta_t$$

w_t and p_t are, respectively, the nominal wage and price level, p_t^e is the expected price and n_t is employment: think of it as synonymous with output y_t. If you prefer, the second equation can be regarded as an (inverted) labour demand schedule. ε_t and η_t are shocks: a wage push, for instance, in the first case; a change in firms' mark-ups or an oil price shock in the second.

The 'potential' level of output, or employment, is the level that obtains in equilibrium, that is when there are no inflation surprises, $p_t = p_t^e$. Potential output, or potential employment, is then:

$$n_t^* = -(b + c)(\varepsilon_t + \eta_t)$$

Note that the potential level of output is not a constant. It moves around with shocks. A wage push, for instance, reduces n_t^* and so does an oil shock. Finally, the actual level of output, or employment, can differ from potential if there are inflation surprises:

$$p_t - p_t^e = (b + c)(n_t - n_t^*)$$

which, subtracting the lagged price level from both sides, and using $\pi_t = p - p_{-1}$, and $\pi_t^e = p_t^e - p_t$ gives:

$$\pi_t - \pi_t^e = (b + c)(n_t - n_t^*)$$

note that there is no error term here. The effects of ε_t and η_t are in n_t^*.

At this point all we need is an assumption about expectations. Take the simplest one: assume that the expected rate of inflation is equal to the realized rate of inflation: $\pi_t^e = \pi_{t-1}$. With this we get:

$$\pi_t = \pi_{t-1} + (b + c)(n_t - n_t^*)$$

which is what we use in the text, with $a = b + c$, and writing it in terms of output, rather than employment – the two being related by the production function.

But the assumption that $\pi_t^e = \pi_{t-1}$ holds exactly may be too strong. Suppose instead that $\pi_t^e = \pi_{t-1} + u_t$. There will now be a residual in the regression, reflecting the formation of expectations. But this term is likely to be small relative to the shocks ε_t and η_t

One could, of course, be more sophisticated and assume that expectations are formed rationally and wage setting is staggered: nothing of substance would change. One could also have (in a way consistent with optimizing models) a forward-looking formulation:

$$\pi_t = \pi_{t+1}^e + b(n_t - n_t^*)$$

where π_{t+1}^e denotes expected future inflation: again the substance would not change.[1]

1. For evidence regarding the empirical relevance of expectations in inflation determination in the euro area see Galí, Gertler, and López-Salido (2001).

2

Monetary and fiscal policy coordination in EMU

2.1 Introduction and summary

The ECB enjoys considerable political autonomy. It follows that monetary and fiscal policies in Europe are set independently. Is this a problem? Is there a need for an explicit coordination of monetary and fiscal policies in Europe in order to achieve desirable outcomes?

Our answer to the question: is there a need for (macroeconomic policy) coordination? is no. If the monetary and fiscal authorities 'keep their houses in order' acting on their own, there is no need for explicit coordination. If the fiscal authorities deviate from 'prudent' and appropriate fiscal policies because of a variety of short-run political incentives and constraints, then explicit coordination may even be counterproductive.

Formal meetings between the monetary and fiscal authorities designed to 'coordinate' policies are either unnecessary or harmful. *Informal* meetings may be a useful channel for information exchange. The benefits of this exchange of information, however, have to be weighed against the possibility that these meetings may be turned by the fiscal authorities into occasions for pressuring the ECB. The participation of the ECB president in the Eurogroup meetings has to be viewed in this context. These meetings may be useful as an exchange of information, but, especially if they are sanctioned as 'formal,' they may become more than information exchange, and be counterproductive.

A peculiarity of the European situation compared to (say) the United States, is that the ECB faces not one, but twelve fiscal authorities. This raises two issues. First is whether or not coordination amongst the 12 fiscal authorities is necessary. Second, it makes these meetings more formal than, say, a weekly

breakfast between the chairman of the Fed and the US Secretary of the Treasury.

2.2 Coordination when the 'houses are in order'

An explicit coordination of monetary and fiscal policy is not necessary, if the monetary and fiscal authorities (independently) follow appropriate and prudent policies. For the monetary authority this means keeping inflation close to its target. Inflation targeting, as we explained, allows for output stabilization: if output is above potential, inflation will show a tendency to increase and the ECB will raise interest rates (and vice versa). For the fiscal authorities, to 'keep their houses in order' means to maintain a cyclically-adjusted balanced budget. This allows for deficits during recessions and surpluses during expansions because of automatic stabilizers. In addition, the fiscal authorities may want to engage in discretionary counter-cyclical policies.

Under these circumstances there is not much that explicit monetary and fiscal policy coordination can achieve. Fiscal authorities in different countries remain free to tailor policies to their countries preferences. These policies will influence the size of government, the allocation between public and private consumption and investment, the level of taxation and redistribution. These choices will affect the composition of output and some of them the level of potential output. None require 'coordination' with a central bank pursuing a policy of inflation targeting and thus the goal of maintaining the euro area level of output close to potential.

A specific example helps clarify this point. In the current European macroeconomic environment, a particular concern is that fiscal authorities may hesitate to introduce policies that reduce deficits, for fear that the ECB might not step in in a timely fashion to avoid a recession. (As we discuss later, that fiscal tightening induces a recession is by no means a foregone conclusion.) Coordination, it is argued, is desirable and should take the form of an agreement between the ECB and the finance ministers, which would imply a tighter fiscal policy combined with easier money. In fact, explicit coordination is not necessary. If the ECB follows an inflation targeting approach, then, if the fiscal contraction were to generate a downturn, the effect of the latter on the output gap, and thus on inflation, would automatically trigger a monetary policy response in the direction of easing. If the monetary policy rule is clearly understood by the fiscal authorities, there is no reason why they should be concerned, and thus no reason to believe that explicit coordination would produce a better outcome.

It may be argued that a need for coordination emerges because

of the timing of policy actions. That is, the fiscal authorities may postpone deficit reduction, waiting for the ECB to ease, while the latter will lower rates only if and when a fiscally-induced downturn materializes. Even this timing issue is not a real problem, however, and does not require explicit coordination for three reasons.

First, the fiscal authorities (and the public) should be sure that inflation targeting automatically implies an ECB intervention in case of a fall of output below potential. Second, fiscal policy packages (i.e. government budgets) are approved several months in advance of their implementation, but monetary policy changes can be decided much more swiftly and more often. Third, the approval and implementation of fiscal policy is subject to a considerable level of political uncertainty. Suppose that the finance ministers sincerely promise a fiscal tightening with the next budget, and assume that the ECB 'coordinates' and, in anticipation of the fiscal manoeuvre, reduces interest rates. If the political climate changes, and the fiscal manoeuvre is abandoned, then the monetary and fiscal package is wrong, because it is over expansionary. In addition, the monetary loosening may actually provide a temporary improvement of the fiscal balance through interest rates and growth, reducing the incentives for the discretionary fiscal tightening.

The need for monetary accommodation to avoid the contractionary effects of fiscal tightening should also not be overemphasized. Recent empirical research has shown that fiscal adjustments that reduce deficits do not always and necessarily cause a recession, but instead can be expansionary, even on impact. Evidence shows that expansionary fiscal adjustments are those that signal a credible commitment to fiscal balance and are achieved by spending cuts, rather than tax increases.[1] In any event, whether or not these 'non-Keynesian' effects of fiscal policy are believed in is beside the point. If these effects are present, then monetary accommodation to fiscal tightening is not necessary. If they are not, monetary accommodation will automatically follow from inflation targeting. In either case, an explicit coordination of monetary and fiscal policy is superfluous.

In a recent discussion of monetary and fiscal policy interactions, Dixit and Lambertini (2000) conclude that coordination is desirable. Their analysis considers the case of two well-intentioned policy-makers with conflicting policy objectives. But if the two authorities are indeed well-intentioned, it is hard to see why they should be targeting different levels of potential output. If the central bank is too conservative (defined as a situation in which it targets a level of output that is too low) this

1. See Giavazzi and Pagano (1990, 1996), Alesina and Perotti (1995, 1997), Alesina, Ardagna, Perotti and Schiantarelli (2000), Perotti (1999) and McDermott and Wescott (1996).

would call for a revision of a mandate of the central bank, not for explicit day-to-day coordination. Nor can there be a conflict about the objective of price stability that has been written into the ECB statutes. Fiscal and monetary authorities may have different objectives for political economy reasons, an issue, which is tackled in the next section.

Buti, Roeger and Intveld (2001), show that 'if the government attempts to stimulate output beyond its natural level, a deficit bias emerges under non-cooperation; under cooperation the equilibrium is characterized by both a deficit bias and an inflation bias.' This clearly suggests that political economy considerations point toward rejecting explicit coordination between monetary and fiscal authorities. This is precisely the point we address in the next section. The same authors argue that under a variety of assumptions, coordination can be beneficial if the fiscal authorities only have anti-cyclical goals in mind and their preferences are in no way biased. This conclusion is not inconsistent with the point that we have made here, namely that when all authorities 'keep their house in order,' coordination cannot do any harm and may have small benefits. We feel strongly, however, that discussing coordination in a context that excludes political economy considerations and policy biases misses the main point.

2.3 The political economy of coordination

Even the best-intentioned finance ministers are subject to extensive political constraints – electoral concerns, the necessity to strike deals with opposition parties, or to favour certain constituencies such as public sector unions.

The complex political game that leads to the formulation of fiscal policy often brings about departures from optimal and prudent policies.[2] In this situation, an active coordination with the monetary authority would make matters worse. On the other hand, the lack of explicit coordination may help create incentives for the fiscal authorities to act more in line with optimality principles. The Stability and Growth Pact is in fact motivated by the fear that without this constraint, fiscal authorities may not keep prudent budgets. Absent of any concern that politics may distort fiscal policy, there would be no need for a stability pact.

The typical case is one in which the fiscal authority wants to overexpand (or not tighten enough). In these situations it would pressure the ECB to accommodate, since sticking to inflation targeting would lead to a restrictive monetary policy, high interest rates and a real appreciation of the exchange rate. If the coordination does not occur, the fiscal authority would blame

2. See Alesina and Perotti (1995) for a survey of political economy models that explain political biases in fiscal policy, generally leading to excessive deficits.

the lack of coordination of policies (expansionary fiscal, contractionary monetary) for the ensuing downturn. Coordination in this scenario, however, means that the central bank should abandon the normal inflation targeting. This would not be a good solution as it simply postpones the costs of a recession needed to eradicate inflation.

In an open economy the combination of an overly expansionary fiscal policy with a non-accommodating monetary policy, may lead to high interest rates and appreciation of the real exchange rate. Some observers suggest that this scenario captures the current situation in the UK. According to the OECD (*Economic Outlook*, June 2000, p.74) in the UK,

> Growth ... continue[s] to be underpinned by the momentum of all major components of final domestic demand, including government spending, which grew by 4.5 per cent last year (the sharpest rise since 1979) and was only partly offset by net imports.... the persistent strength of the pound caused further market share losses ... and the goods trade deficit widened sharply reaching 3 per cent of GDP.

Whether or not the fiscal expansion in the UK is indeed the main cause of the appreciation of the pound is not certain. In any event, this scenario, as described by the OECD report, illustrates an intriguing possibility. For a given stance of fiscal policy, coordination between the Bank of England and the Treasury could slow down the real appreciation by accepting higher inflation. In the short run this could appear an acceptable second-best outcome, particularly since it takes care of the complaints of exporters who would have been crowded out by the real appreciation. But the economic costs of the overly expansionary fiscal policy would simply be postponed. Furthermore, the perception that an excessively expansionary fiscal policy could be accommodated, makes it more likely that politicians with short horizons will abandon fiscal prudence.

While the previous example is, so far, the most common occurrence, it is intriguing to consider a different scenario in which political incentives lead to fiscal policies that put downward pressure on the economy. For example, suppose that the fiscal authority raises taxes to increase the salaries of public employees for electoral purposes. The empirical evidence gathered by Alesina and Perotti (1997) and Alesina, Ardagna, Perotti and Schiantarelli (2000), amongst others, suggests that this policy would put downward pressure on output. Assume that current output falls more than potential output: the inflation targeting approach would require a loosening of monetary policy. This is exactly what the fiscal authority would want: so, again, explicit coordination is not necessary. An intriguing question is whether or not the ECB, in a situation like this, should make life tougher for the fiscal authority in order to discourage such a policy. Regardless of the answer to this question, explicit coordination is certainly not the way to enforce incentives upon misbehaving fiscal authorities.

Suppose, instead, that the fiscal authorities cut taxes, creating an economic expansion. If the tax cut raises potential output, it will not put upward pressure on inflation; then the central bank, if it sticks to inflation targeting, will not prevent the expansion from occurring. If, instead, the output growth is inflationary, the central bank will step in, as it should. Once again explicit coordination is not necessary.

The bottom line is that if fiscal authorities are motivated by short-term political incentives, active coordination between monetary and fiscal policy cannot be beneficial. Formal meetings between the ECB and fiscal authorities would become an opportunity for the latter to put pressure on the former.

2.4 Coordination without inflation targeting

As we discuss thoroughly in this report, so far the ECB has not followed a strict inflation targeting rule. Its strategy is more elaborate and involves two pillars – inflation and money growth. Does this justify coordination with fiscal authorities? The answer is, again, no.

First of all, as we discuss in Chapter 4, the actual behaviour of the ECB is not too far from an inflation targeting approach. In any event, that ECB policies leave more room for discretion than a simple strategy based upon inflation targeting, on balance makes coordination even less desirable. In fact, to the extent that monetary policy does not follow a simple rule, the fiscal authorities may have more 'room to manoeuvre' in putting pressure on the ECB. In fact, we see this as a rather strong argument in favour of a relatively strict adherence to an inflation targeting rule.

If the fiscal authority could be perfectly sure about the reaction of the ECB to various fiscal choices, they would incorporate this into their plans. Knowing that an overly expansionary fiscal policy would not be accommodated would restrain them; knowing that the possible downturn created by a fiscal adjustment would induce a loosening of monetary policy, would weaken the political opposition to budget cuts. This is one of the benefits of clearly stated monetary strategies.

The bottom line is that any degree of uncertainty about the response of monetary policy to a move by the fiscal authorities would justify their call for taking decisions jointly, i.e. for formal coordination. The ECB would then have a hard time explaining why it does not wish to take part in such exercises.[3]

2.5 Multiple fiscal authorities

Thus far we have ignored the fact that in EMU there are 12 fiscal authorities, rather than one. Should these 12

3. Jacuet and Pisani-Ferry (2000) come close to making precisely this point.

finance ministers coordinate their policies? More to the point of this report, what are the implications for the monetary–fiscal policy mix?

By 'fiscal policy' we here mean the aggregate budget position of a country. We ignore the issue of the coordination of tax systems (e.g. coordination of tax rates on financial assets). Regardless of whether or not it is desirable, coordination of tax systems would entail rewriting legislation rather than coordination of policy decisions on a short-term basis, which is the topic under consideration here.

Again, if the fiscal authorities follow optimal fiscal policies, there is no need for coordination. (Note that given imperfectly synchronized business cycles, the budget of the 12 countries will also not be synchronized.) An interesting case, however, is the following. Suppose that several well-intentioned finance ministers want to reduce deficits and retire excessive debt inherited from the past. The potential costs of a fiscal contraction for each country acting alone may be higher than those incurred by a coordinated move. If a fiscal authority were to act alone, and if the fiscal contraction caused a nation-specific downturn, the ECB would not step in, since the ECB targets the euro area not any specific country.[4] In this case coordination among the 12 would make sense.

The benefits of coordination amongst the 12 are less clear if the fiscal authorities are motivated by short-term political goals. Suppose that the fiscal authorities want to overexpand for short-term political gains. If a country acts alone, as discussed above, it would create inflation and real exchange rate appreciation. But if the 12 act together, the ECB would step in and tighten monetary policy to prevent an acceleration of inflation, should it materialize. Which of the two scenarios is more costly for the country with a loose fiscal policy is unclear. If it is more costly to act alone, coordination reduces the cost of an incorrect policy action, and may thus make it more attractive.[5]

Whether or not the 12 fiscal authorities coordinate with each other also has implications for the relationship with the ECB. If the fiscal authorities are well-intentioned then, although coordination remains unnecessary, the meeting with the ECB can indeed be a useful exchange of views and information. If fiscal authorities coordinate on the wrong policies, then, acting together they may increase the pressure on the ECB to deviate from inflation targeting.

4. As discussed above, however, not all fiscal adjustments are contractionary.
5. The Stability and Growth Pact addresses precisely this externality: the incentive for a single EMU member to overexpand, under the assumption that its own effect on overall inflation is small. For further analysis see Beetsma and Uhlig (1999).

2.6 Meetings between the ECB and the Eurogroup

Nice has opened the road for the formal participation of the ECB in the meetings of the Eurogroup. The Treaty provides a new institutional framework that could allow the coordination between monetary and fiscal policy inside EMU. The procedures for 're-enforced cooperations' make it possible to formalize the dialogue, so far informal, which takes place among the 12 finance ministers and between them and the President of the ECB in the so-called Eurogroup. (The ECB, in the October 2000 *Bulletin*, said that it considers such a dialogue useful.)

Our previous discussion on the pros and cons of coordination of monetary and fiscal policy raises considerable concerns about these meetings. They can certainly serve as an exchange of information – even though, to the extent that information should be publicly available, it may not require closed door meetings at the highest level. Nevertheless, meetings among well-intentioned policy-makers may serve useful purposes.

As we argued above, however, one cannot assume that fiscal authorities are always free from political incentives that lead them to deviate from policy-making with a long-term horizon. In this case the danger of these meetings is that they can provide an officially sanctioned forum for the fiscal authorities to put pressure on the ECB. Whether or not the latter might be influenced would depend, in part, on the personalities involved. In some cases the ECB might be negatively influenced. In other cases, the influence of the ECB may lead to an improvement of the fiscal stance.

The potential danger of these meetings obviously increases with their formality. The US provides an interesting comparison. The weekly breakfast meeting between the Chairman of the Fed and the Secretary of the Treasury is very informal and does not seem to compromise the degree of independence of the Fed. If these meetings assumed a more formal format, and were officially sanctioned by law, they might take a very different character and could affect the perceived degree of independence of the Federal Reserve.

Participation of the ECB in formal meetings of the Eurogroup would make such encounters very different from the informal US-style breakfast. But formality would be hard to avoid in meetings involving not one but 12 finance ministers.

Overall, our judgment is that the potential benefits of these formal meetings are less than the risks they entail.

3

Country adjustments within the euro area: lessons after two years

When EMU started, many worried about how member countries would adjust to idiosyncratic national shocks. Without national monetary policy at their disposal, what would happen to countries that suffered from depressed demand? How would they recover? What would happen to countries that suffered from excessive demand? How would they slowdown? Would they be able to achieve a soft landing?

After two years, we can draw some lessons. Perhaps the main one is that the new rules of the macroeconomic policy game under the euro are poorly understood by governments and observers alike. Our purpose in this chapter is to review the evidence and the policy debates, and draw a number of lessons for the future.

Why should this be part of a report on monetary policy and the European Central Bank? There are at least three reasons. First, euro area-wide monetary policy is only part of the general macroeconomic policy framework which has to emerge within the euro area. Second, failure to use national fiscal policy and real exchange rate adjustments appropriately will lead to poor economic performance and in turn to hostility towards the euro. Third, much of the confusion is about the role and the nature of national inflation differentials (*vis-à-vis* the euro area average) – a confusion that the ECB is in a unique position to clarify.

3.1 Relative growth and inflation performance

For the first two years of its existence, the ECB has been lucky. As shown in Figure 3.1, the main outliers in terms of growth performance, have been on the upside. Seven of the 11 countries (we have left out Luxembourg, but added Greece, the newcomer, to the list) have had an average annual growth rate

within 1 percentage point of the euro area average. The remaining four have all been on the upside, exceeding the euro area average by more than 1 percentage point. The most impressive performance has been that of Ireland, at 7.4 percentage points above the euro area average. The other three have been Finland at 1.7 percentage points, and Spain and the Netherlands, both at 1.1 percentage points.

This positive skewness has clearly been a political blessing for the ECB. Think of the outcry about monetary policy had the outliers been on the down side. While some economists point to the dangers of an overheating economy, their worries in that context are often seen as quaint and do not resonate very much with either politicians or citizens. In contrast, recessions quickly lead to calls for identifying the culprits, for changes in policy, and for heads to roll.

True, the lessons from the upside are not likely to apply directly on the downside, precisely because political responses are likely to be different. Some lessons can be drawn nevertheless, in particular about the role of fiscal policy and the real exchange rate in the adjustment process.

Most of the differences in growth rates we have observed over the last two years represent sustainable differences, differences which can last for quite some time without the need for specific adjustment. The euro area can accommodate sustained differences in rates of growth among its members.

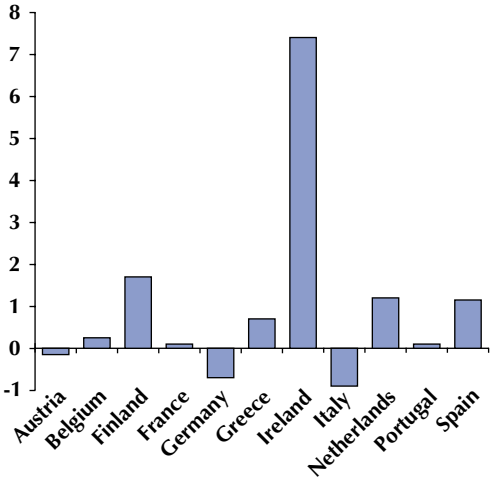
That this could be the case had been pointed out before EMU. In the United States, individual states have grown at very different average growth rates over long periods of time. Since 1950, average annual employment growth in Nevada, Arizona and Florida has exceeded 4%; employment growth in Rhode Island, Pennsylvania and West Virginia has been less than 1%.

This has happened without upward pressure on inflation in states which grew faster or downward pressure in states which grew more slowly.[1] The reason is that these different growth rates across states have reflected different growth rates of potential output.

The same is true of the euro area. To the extent that they have different rates of growth of potential output, members of the euro area can grow at different rates. Sustainable growth rates vary between members for a number of reasons:

First, they have different rates of growth of population, mainly through immigration. This is the dominant explanation for differences across US states. It is typically less important within the euro area. But immigration has been an important factor in the growth of Ireland over the last decade.

Figure 3.1 Average growth rate 1999–2000: deviation from the euro area average (percentage points)



1. There do not exist state-specific GDP deflators or CPIs. But city-specific CPIs do exist and show no trend difference between fast- and slow-growing cities.

Second, there are changes in labour force participation. For example, the participation rate has increased in the Netherlands by eight percentage points over the last decade.

Third, the equilibrium unemployment rate can change. This has clearly been a major factor in Spain, where the unemployment rate has fallen by nearly ten percentage points from its peak, most of it due to a decrease in the equilibrium rate of unemployment.

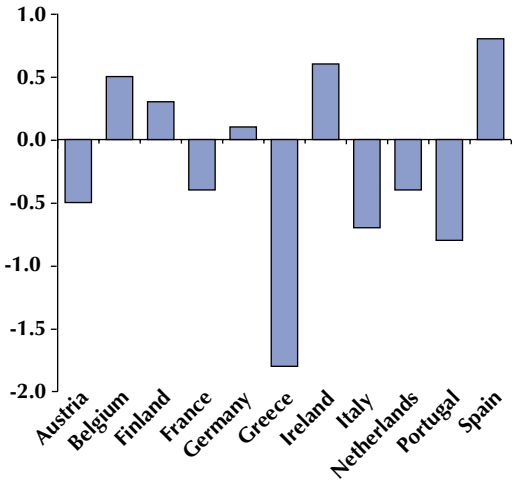
Fourth, members exhibit different rates of growth of productivity. Productivity growth in Spain is now running at an anaemic 1–1.5%; in Ireland, it has exceeded 4% for some time.

Thus, that Ireland (because of high productivity growth and immigration) and Spain (because of the large decrease in the equilibrium unemployment rate) have had faster growth than the average has not been, and is not, a problem.

Adjustment problems come only when actual output exceeds potential output. The signal of such an imbalance is an increase in inflation, reflecting the inconsistency between the real wages firms are willing to pay and the real wages workers are asking for in bargaining. Figure 3.2 shows, for each country, the change in the inflation rate from 1998 to 2000 (using harmonized indexes of consumer prices) as a deviation from the euro area average. On one side is Greece, which, in its quest for euro membership, has cut its inflation rate from 4.5% in 1998 to about 2.9% in 2000. On the other side, the two main countries are Ireland and Spain. In both cases, the deviation has been modest, less than 1% relative to the euro area average. But both countries now have the highest inflation rates in the euro area – 4.6% for Ireland, and 4% in Spain.

To get a better sense of the issues, we shall examine both the Irish and Spanish situations in more detail. Before we do, we briefly discuss a related issue, known as the Balassa–Samuelson effect.

Figure 3.2 Changes in inflation rates 1998–2000: deviation from the euro area average



3.2 Equilibrium inflation rates and the Balassa–Samuelson effect

In a number of countries, especially those where inflation is above the euro area average, the argument has been made that this higher inflation is an equilibrium phenomenon, and thus nothing to worry about. Higher inflation, the argument goes, does not come about because output exceeds potential: it simply reflects the adjustment of relative prices naturally associated with growth, and known as the Balassa–Samuelson effect.

There is little question that where the argument has been made, it has been in part self-serving, coming from a desire to justify what would otherwise be perceived as a sin, namely inflation higher than the euro area average. Whatever the confused

motivation, the argument is based on solid theoretical grounds. The point is to have an idea of how large the Balassa–Samuelson effect could be and whether it is enough to explain the inflation differentials we observe across the members of EMU.

Consider an economy with both tradable and non-tradable goods. Suppose that productivity growth is faster in the tradable than in the non-tradable sector – which it typically is. Productivity growth, together with a given world price for tradables, implies a steady increase in the real wage in terms of tradables (assuming that profits are tied down by the world real interest rate and thus cannot change.) The increase in the real wage and lower productivity growth in non-tradables combine to imply an increase in the relative price of non-tradables. This is known as the Balassa–Samuelson effect. The argument is particularly relevant for emerging countries, which are catching up fast. In these countries, the relative price of non-tradables must increase, leading to a steady increase in the relative price level, or equivalently, to higher inflation.

How large is this effect likely to be for euro area countries? The study by De Gregorio and Wolf (1994) provides a good starting point. Using data from 14 OECD countries from 1970 to 1985, they regress real exchange rates for each country for each year on a country dummy, total factor productivity growth in tradables relative to non-tradables, an index of terms of trade, and the ratio of government spending to output. They obtain the following regression results:

$$\Delta\log(P/eP^*) = 0.197\ \Delta\log(a_T/a_N) + 0.485\ \Delta\log(P_X/P_M) + 3.458\ \Delta\log(G/Y)$$

where e, P*, P are the nominal exchange rate, the world price level and the domestic price level respectively; a_T and a_N are total factor productivity growth rates in the tradable and non-tradable sectors respectively; P_X and P_M are the price of exports and imports respectively; and G/Y is the ratio of government spending (presumably mostly on non-tradable goods and services, hence the positive sign) to GDP.

The relevant term for us is the first, which gives the effects of relative productivity growth in the tradable and non-tradable sectors on the relative price level. We can use it to get a sense of the likely magnitude of the Balassa–Samuelson effect.

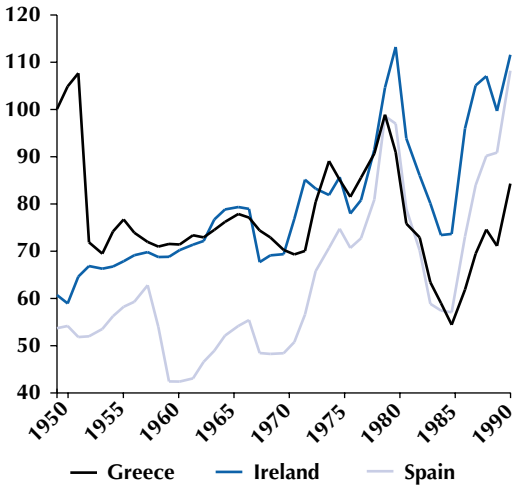
Take Ireland, for example. A Solow growth decomposition suggests that, from 1995 to 2000, annual total factor productivity (tfp) growth for the economy as a whole was around 4.3%. To get an upper bound, assume (and this is surely excessive) that tfp growth has been 8% in the tradable sector, and 2% in the non-tradable sector. Assume, and this is again excessive, that in the rest of the euro area, there was no difference between tfp growth in the tradable and the non-tradable sector. Then, this would translate into an increase of 8% multiplied by 0.197 – or about 1.5 percentage points a year more

inflation in Ireland than in the euro area. This generous upper bound is still quite small considering that over the first two years of EMU, Irish inflation has been on average 2.5 percentage points higher than the euro area rate.[2]

For Spain, where again the Balassa–Samuelson effect has been invoked, it is hard to see how the effect can be quantitatively relevant. Recent output growth in Spain has come mostly from the decrease in unemployment, not from productivity growth, which has been very low – about 1%,[3] far below the euro area average. This suggests that if anything, the Balassa–Samuelson effect is going the wrong way for Spain.

The data set constructed by Summers and Heston (1991) provides a longer time perspective. The evolution of the relative price levels for Greece, Ireland, and Spain (relative to the United States) from 1950 to 1980 are shown in Figure 3.3. These are consumer prices: since CPIs include both tradables and non-tradables, if the Balassa–Samuelson effect were important, higher growth countries should feature a trend increase in their CPI relative to the United States. All three series show the dollar cycle of the 1980s, which makes it harder to see the underlying trends. There is no visible trend in the price level for Greece. But there is for Spain and Ireland. For both countries, over the 40-year period, the trend suggests an increase in the price level relative to the United States of about 1.3% per year.

Figure 3.3 Relative price levels (US=100)



Source: Summers and Heston (1991)

3.3 How to adjust when adjustment is needed?

Suppose output in a member of the euro area starts to exceed potential output and inflation begins to rise. The country has two ways of adjusting: either by letting inflation increase above the euro area average, leading to an appreciation and a decrease in foreign demand; or by using fiscal policy, to decrease domestic demand instead. Neither way is *a priori* good or bad. Which is appropriate depends on external and internal conditions.

To pursue this point, let us use a conventional textbook

2. A parallel computation is given by Sinn and Reuter (2001). Using sectoral data for the period 1987–95, they estimate Irish labour (not total factor) productivity growth to have been 6% in the tradable sector, versus 2% in the non-tradable sector. Because they assume a larger effect of the productivity differential on the real exchange rate than we do here, they conclude that this translates into an inflation differential of 2.3% for Ireland relative to the rest of the euro area.
3. One may wonder whether this surprisingly low number is not in part the result of mismeasurement. A careful study by Estrada and Lopez-Salida (2001) suggests that this is not the case. It finds a rate of total factor productivity growth equal to 1.8% for the period 1980–95 for the Spanish economy as a whole, and to 1.9% for manufacturing. The study also shows clear evidence of a decrease in both rates of growth in the 1990s.

model, some simple algebra and an associated diagram. Let the condition for equilibrium in the goods market (IS) be given by:

$$y = a(y,g) + nx(\varepsilon,y)$$

where y is output, a(y,g) is the sum of consumption, investment and government spending, and is assumed to be a function of output and some index of fiscal policy, g, with $a_y > 0$ and $a_g > 0$; nx(ε,y) is net exports, assumed to be a function of the real exchange rate, ε, and output, with $nx_\varepsilon > 0$ (an increase in ε is a real depreciation, and improves net exports), and $nx_y < 0$ (an increase in output increases imports, reducing net exports).

Internal balance requires $y=y^*$, where y^* is equilibrium output. External balance requires balanced trade, nx(ε,y)=0.

Finally, through a conventional Phillips curve, assume that internal imbalance leads to an *increase* in inflation and thus to *faster* real appreciation:

$$\Delta^2\varepsilon = -\Delta\pi = -f(y-y^*)$$

These relations are shown in Figure 3.4, with the real exchange rate on the vertical axis and output on the horizontal axis. The IS relation is drawn for a given value of g and is upward sloping: a depreciation leads to an increase in equilibrium output. The internal balance equation is vertical at $y=y^*$. To the right of y^*, the real exchange rate appreciates, and the economy moves down along the IS curve. To the left of y^*, the real exchange rate depreciates, and the economy moves up along the IS curve.

Now suppose that the economy is overheating, say at point A. One option is to let the economy run its course unhindered, with inflation leading to appreciation and a return of the economy to point A′. Another is to rely on fiscal contraction – to shift the IS curve to IS′ leading the economy to rest at point A′′. In both cases, the economy eventually returns to the same level of sustainable output, y^*. What differs is the real exchange rate and thus the composition of demand, internal versus external. The more use of fiscal contraction, the smaller the real appreciation, the more favourable the external balance.

What instrument should the government use? This obviously depends on the source of overheating: internal or external demand. Turn to Figure 3.5. In addition to the IS locus, draw the locus along which there is external balance, NX=0. The locus is upward sloping: An increase in output worsens the trade balance, requiring a depreciation, i.e. an increase in ε. It is flatter than the IS curve. (To see this, start from the point on the IS curve where there is external balance, and move up along the IS curve. As, by assumption, the domestic marginal propensity to spend is less than one, the difference must be made up by an improvement in the trade position. Thus, we move from balance to surplus. Put another way, an appreciation is needed to re-establish external balance: the NX=0 locus is below the IS curve.)

Figure 3.4 Adjustment of an overheating economy

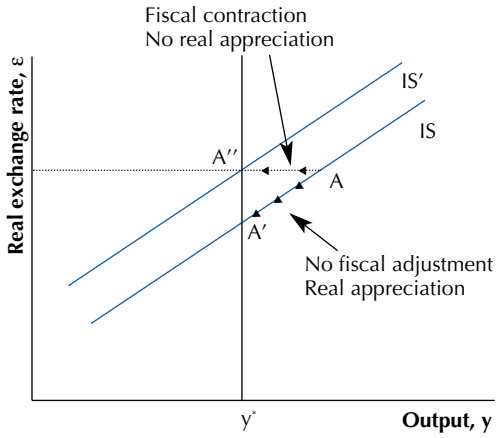


Figure 3.5 Adjusting to an increase in internal demand through a fiscal contraction

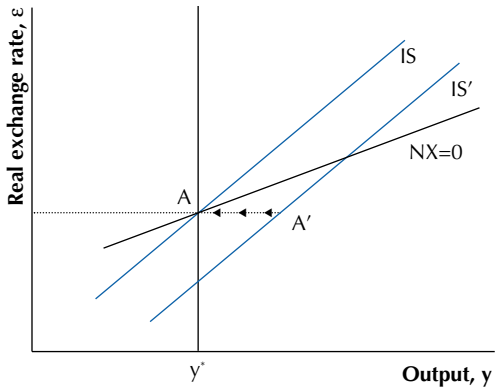
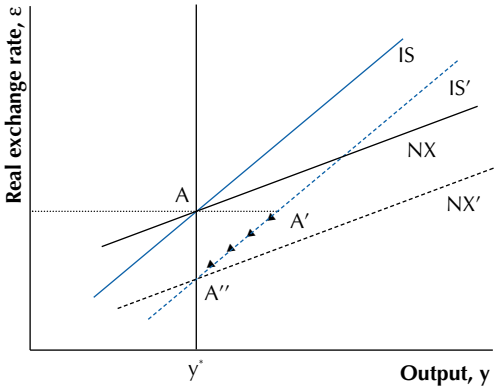


Figure 3.6 Adjusting to an increase in external demand through inflation and real appreciation



Assume, initially, that the economy is at point A, with both internal and external balance. Now assume that internal demand shifts up. The IS curve shifts to the right to IS', while the NX=0 locus remains unchanged. The economy is now at A', with higher output and a trade deficit. What is required in this case is clearly the use of fiscal policy, a fiscal contraction that shifts the IS' curve back to IS, and returns the economy to both internal and external balance.

The case where the source of the shock is external demand instead is represented in Figure 3.6. For a given value of y, the shift in external demand shifts the NX locus down to NX': external balance requires an appreciation. And, for a given y, the shift in IS is the same as the shift in NX. The effect of the shift is to take the economy to A', with higher output and a trade surplus. In this case, the appropriate policy is clearly not to use fiscal policy, and let the economy adjust along the new IS curve back to A'. At A'' the economy achieves both external and internal balance. Put another way, the correct response to the increase in external demand is to let the relative price of domestic goods increase in order to reduce demand and return output to normal. This increase in the relative price (and the associated increase in real income) is achieved by letting inflation exceed euro area inflation for some time.

Let us consider two ways in which this analysis is an oversimplification.

First, external balance may not be the right target for an economy, in particular for an economy with a high underlying rate of growth (such as in Ireland). To the extent that profit opportunities are present and lead to a high investment rate, it may be best for the economy to run current account deficits now, in anticipation of current account surpluses in the future. In this case, inflation may well be the right instrument, even if it leads to a current account deficit at sustainable output levels.

Second, whether to use fiscal policy and choose the appropriate budget position must depend on the initial fiscal situation, *vis-à-vis* both the deficit and the level of debt. If debt is still high, or if spending is anticipated to be higher in the future, a more conservative fiscal policy is then appropriate, and with it more focus on fiscal contraction than on inflation as the method of adjustment. On the other hand, if debt is falling, the budget shows a surplus and public investment offers the prospect of hefty social returns, the conclusion may then be the opposite: a temporary fiscal expansion with the adjustment falling entirely on an accelerated inflation differential.

The use of each of the two tools has its own complex dynamics.

Adjusting through inflation may not be so easy. Given inflation inertia, there is the risk of achieving too large a real appreciation – of reducing competitiveness by too much. Having inflation return to the euro area average just when the real exchange rate is

at the right level is at best a delicate exercise.[4] With a common nominal interest rate throughout the euro area, a country with higher inflation will have a lower real interest rate: this will expand domestic demand, working against the real appreciation. Eventually, however, the real appreciation will dominate since the fall in the real interest rate is proportional to the inflation differential, while the real exchange rate keeps appreciating at the rate of the inflation differential.

Using fiscal policy is not so easy either. Leaving aside automatic stabilisers, decision and implementation lags make it hard to get the timing right, and the lesson from history is that the fiscal policy response often comes too late.

Leaving these complications aside, the analysis yields a simple but important message. Domestic inflation, which is better thought of as an increase in the relative price of domestic goods, may well be a desirable part of the adjustment process. The more external demand is the source of overheating, the more inflation is the natural instrument to return the economy to sustainable output levels. In that context, it should be not denied or dismissed (by invoking the Balassa–Samuelson effect), not put off the table from the start, but accepted and explained.

3.4 Overheating in Ireland

The relevant macroeconomic evidence for Ireland from 1998 to 2000 (with forecasts for 2001) is given in Table 3.1. Let us focus on five facts:

First, Ireland has experienced extremely high GDP growth. Because of the increased repatriation of profits by foreign firms, GNP growth has been slightly lower. Ireland has achieved this growth through immigration, an increase in labour market participation rates, a decrease in unemployment, and high productivity growth. Unemployment has fallen from 7.6% to 4.2%, and this rate must now be close to the lowest sustainable level that Ireland can hope to achieve; this factor alone implies a slowdown in sustainable growth.

On the demand side, this expansion has come in about equal proportions from an increase in internal and external demand. For the last two years, the growth of domestic demand has been slightly below GDP growth and has been generated by private demand, especially investment. Both exports and imports have grown faster than GDP. Ireland is an increasingly open economy and the ratio of exports to GDP is now close to 1.[5]

Table 3.1 Ireland's economic performance 1998–2001

	1998	1999	2000	2001
GDP growth (%)	8.6	9.8	11.0	7.9
GNP growth (%)	7.8	7.8	9.0	6.2
Unemployment rate (%)	7.6	5.6	4.2	3.6
Growth rates:				
Internal demand (%)	*9.4*	*6.3*	*8.6*	*7.8*
Investment (%)	*15.5*	*13.0*	*11.3*	*9.5*
Consumption (%)	*7.8*	*7.7*	*8.7*	*8.0*
Exports (%)	*21.4*	*12.4*	*15.5*	*13.3*
Imports (%)	*25.8*	*8.7*	*14.9*	*14.1*
Current account surplus (% of GDP)	0.9	0.7	0.9	0.3
Government surplus (% of GDP)	2.2	2.7	4.0	6.5
Inflation (%) (GDP deflator at market prices)	5.8	3.8	4.8	4.6

Source: OECD *Economic Outlook*, December 2000

4. Technically note that a system of the form $\Delta^2\varepsilon = -b\varepsilon$ has pure complex roots and thus displays oscillations.
5. Also the direction of trade has changed drastically: exports to the UK have fallen from 75% of the total in 1960 to 20% today; exports to the rest of the EU have risen from 18% in 1972 to 45% today.

The result of this balanced expansion has been a small and roughly constant current account surplus as a proportion of GDP – reflecting a large trade surplus and an almost equally large flow of profit income abroad.

Strong growth has led to a steady improvement in the fiscal position. The budget position has moved from a surplus of 2.2% of GDP to 4.0% in 2000, with a forecast 6.5% in 2001. Gross financial liabilities, which had peaked at about 110% of GDP in the late 1980s, now stand around 40%.

Most of the growth reflects sustainable growth of output. In the recent past, however, there have been signs of wage pressure, leading to an increase in inflation. Wage inflation is now running at an estimated rate of 7.5%, ahead of the 5.5% agreed to in the Program for Prosperity and Fairness (more on this below).

In short, Ireland can clearly sustain a high growth rate for the foreseeable future. But not quite the current growth rate. The Irish economy is now above its sustainable level of activity, and thus should slow down. Based on our earlier discussion, what form should the adjustment take?

The first answer is that given the balanced nature of the increase in demand, the adjustment should be equally balanced, i.e. it should include a mix of fiscal contraction and inflation/real appreciation. Additionally, at this stage, given the fast growth and strong investment demand, the appropriate current account position for Ireland may well be a deficit, a reliance on world saving to finance some of Irish investment. This in turn suggests either more emphasis on the reduction of external demand (and thus on inflation) and less on fiscal contraction, or at least on fiscal measures which are not investment friendly. Finally, when starting from a large budget surplus, fiscal contraction (i.e. a larger surplus) may not be of the essence. Indeed, there is a strong case for higher public investment to keep public infrastructure in line with the rapidly growing economy.

In short, inflation is likely to be part of the optimal policy package. Put in a more positive light, one of the ways that the Irish economy should be slowed is by increasing the relative price of Irish goods, and, through this channel, increasing the real income of Irish people. This is not quite the form that the debate has taken.

The advice from the European Commission and Ecofin to the Irish government has constantly denied that inflation could be used as a tool for adjustment.

Inside the country, inflation has been either denied (blamed on external factors, on the price of oil, or presented as a Balassa–Samuelson effect) or else denounced as something the Irish economy should avoid, lest it wants to lose competitiveness.

Words have been stronger than deeds at this point. In announcing the budget for 2001, the government delivered on an earlier promise of income tax cuts. This has led to a revision

by the Central Bank of its forecast of CPI inflation for 2001 from 4% to 5%, and a forecast of 9.75% for wage inflation.

These tax cuts have been part of an original combination – tax cuts in exchange for wage moderation in 2001 – within the structure of the agreement between the government, employers, and unions, known as the PPF (Program for Prosperity and Fairness). This way, the government has argued, the economy will continue to grow, and grow without wage inflation.

Does this particular form of incomes policy make sense? From a distance, not much – not in the current economic situation faced by Ireland. The claim that the income tax cuts will increase labour supply and thus allow for a further sustainable decrease in unemployment is implausible. At best, this tax cut plus wage moderation will buy time. But, sooner or later, the economy will have to slow down, and this will require a wage increase and/or fiscal contraction. There is no way to avoid both.

3.5 Spain

The relevant macroeconomic evidence for Spain from 1998 to 2000 (with forecasts for 2001) are given in Table 3.2. Let us start again with a brief review of the relevant facts:

GDP growth has been fast, but not compared to Ireland. Each percentage point of growth has been associated, however, with a much larger decrease in unemployment than in Ireland. This is for a number of reasons, one of them directly relevant in thinking about the future, and the appropriate policy package: a dismal productivity performance, which, in this context, has one silver lining. Output growth has been more job-intensive, i.e. associated with higher employment growth, than elsewhere.[6]

Given a stable labour force and poor productivity growth, high output growth can continue only if the sustainable unemployment rate continues to decrease. While unemployment is still above 12%, a sustainable decrease in unemployment will be much harder than it has been until now. The prime-age-male unemployment rate is now close to the EU average. Progress must come from the reduction of unemployment among other groups, especially the young.

The expansion has been driven both by internal and external demand. For the last three years, domestic demand has grown faster than GDP and this has been reflected in an increasing current account deficit, which now stands at 3.3% of GDP.

Note that in contrast to Ireland, this current account deficit does not reflect either unusually strong productivity growth, or

Table 3.2 Spain's economic performance 1998–2001

	1998	1999	2000	2001
GDP growth (%)	4.3	4.0	4.1	3.5
Unemployment rate (%)	18.8	15.9	14.1	12.9
Growth rates:				
Internal demand (%)	*5.6*	*5.5*	*4.2*	*3.7*
Investment (%)	*9.7*	*8.9*	*6.1*	*6.6*
Consumption (%)	*3.1*	*4.5*	*4.7*	*4.1*
Exports (%)	*8.3*	*6.6*	*11.0*	*9.4*
Imports (%)	*13.4*	*11.9*	*11.0*	*9.8*
Current account surplus (% of GDP)	–0.2	–2.1	–3.3	–3.7
Government surplus (% of GDP)	–2.6	–1.1	–0.3	0.2
Inflation (%) (GDP deflator at market prices)	2.3	2.9	2.9	2.9

Source: OECD *Economic Outlook*, December 2000

6. For further discussion, see Blanchard and Jimeno (1999). The purpose of that article was to characterize, as of 1998, the path required to decrease unemployment in Spain to 5% by 2005. So far, actual developments, in particular for output, unemployment, and the current account, have turned out surprisingly close to the path characterized in that paper.

high investment demand. In 2000, investment growth, while higher than consumption growth, was only 2% above GDP growth. The ratio of investment to GDP is not unusually high by EU standards.

Fiscal policy has been aimed at steadily reducing the budget deficit, so that it is now roughly in balance, with a small surplus forecast for 2001. Gross financial government liabilities have decreased as a percentage of GDP since the mid-1990s, but still stand around 65% of GDP, down from a high of 72% (net liabilities are around 45%, down from a high of 52%). There does not seem to be much desire on the part of the government to generate the surpluses which would lead to a large reduction in the debt to GDP ratio. (Indeed, income tax cuts implemented in 1999 point the other way.)

Much of the growth so far has been equilibrium growth, without much pressure on inflation. Inflation has increased a little and now stands at about one percentage points above the euro area average.

In the light of our earlier analysis, these facts have two implications. First, it is not obvious that there is yet a need for a slowdown. This will depend in large part on progress in further reducing equilibrium unemployment. At this point, this requires strong and specific labour market reforms, targeted at specific groups – the young and those close to retirement in particular. Second, relative to Ireland, the adjustment should be much more from internal than from external demand.

The current account deficit is already large and getting larger. While there is no problem in financing it, it still implies an accumulation of foreign debt and higher payments to the rest of the world in the future. In contrast to Ireland, the lacklustre performance of investment and the poor rate of productivity growth do not suggest a strong case for high current account deficits now. On the fiscal side, there is clearly room for a larger surplus and a further decrease in debt.

How do these conclusions relate to the current policy debate in Spain?

As far as we can tell, there is not much of a policy debate. Again, there appears to be a tendency to dismiss inflation in excess of the euro area average as being the result of the Balassa–Samuelson effect, an argument which seems to have no factual basis.[7] In short, maybe because there is no need for it yet, there does not appear to be much thinking about adjustment. Such thinking should start now.

7. Another way of making the point that inflation reflects more than Balassa–Samuelson effects is to note that inflation in manufacturing (clearly a tradable sector) runs at 2.4%, compared to 0.9% for the euro area.

3.6 Tentative conclusions

Should countries care about inflation differentials? Not necessarily. In a common-currency area, having higher inflation than the average may be the proper way to adjust. Whether or not it is depends on whether the adjustment should come from internal or external demand.

It is important in this context not to demonize inflation. After convincing citizens that inflation was bad, governments and the ECB must now go to step two, and explain that temporary inflation differentials can be desirable, leading to higher real income and the proper macroeconomic adjustment.

It is also important to revisit the role of fiscal policy. Governments will need tools to affect domestic demand and its composition. Automatic stabilizers exist more by accident than by design. There is no reason that the amount of stabilization they deliver is either best or targeted at the appropriate components of demand. Thinking about their design and the overall use of fiscal policy is urgent. A corollary is that keeping the cyclically adjusted budget close to balance is important to be able to use these stabilizers when the need arises.

So far, the outliers have been on the high side, so whatever mistakes have been made in the design of macroeconomic policy have been less visible, and surely less painful. But, since the start of EMU, Japan keeps reminding us, governments and the ECB should be ready and quick to respond when some of the outliers turn out on the low side – an event we shall, sooner or later, have to confront.

4

How does the ECB set interest rates?

This chapter assesses the extent to which the interest rate decisions made by the ECB since the launch of EMU have been consistent with its strategy and objectives. In particular, we examine the extent to which changes in interest rates over the past two years can be accounted for by inflation developments in the euro area.

4.1 A first look at the numbers

Table 4.1 lists all the Council decisions involving a change in the key policy rate, together with the date of the Council meeting at which that change was decided. It also shows the annual HICP inflation rate for the euro area corresponding to the month preceding the decision (and, hence, one that is likely to be available at the date of the meeting) and the cumulative change since the previous interest rate adjustment.

With the exception of the interest rate cut in April 1999, all interest rate adjustments have taken the form of an *increase* of 25 or 50 basis points. HICP inflation for the euro area had increased in the months leading to all these decisions, with the exception of the 50 basis points raise of 8 June 2000, which was preceded by a slight decline in headline inflation. Hence, and just on the basis of that information, there seems to be prima facie evidence that interest rates decisions by the ECB during that period have been made in response to growing inflationary pressures.

A closer look at the numbers is quite revealing. The interest rate at the end of 1999 stood at the same level as at the beginning of the year, even though headline inflation had increased from 0.8% to 1.7% over the same period. On the other hand, during 2000 the interest rate rose by 175 basis points, compared to a rise of 100 basis points in headline inflation. Prima facie, and on the basis of those numbers, it would appear

Table 4.1 Interest rate changes and HICP inflation

	r	Δr	π	$\Delta\pi$
22 December 1998	3.00	-	0.8	-
8 April 1999	2.50	–0.50	1.0	+0.2
4 November 1999	3.00	+0.50	1.4	+0.4
3 February 2000	3.25	+0.25	1.9	+0.5
16 March 2000	3.50	+0.25	2.0	+0.1
27 April 2000	3.75	+0.25	2.1	+0.1
8 June 2000	4.25	+0.50	1.9	–0.2
31 August 2000	4.50	+0.25	2.4	+0.5
5 October 2000	4.75	+0.25	2.8	+0.5

Source: ECB *Monthly Bulletin*, various issues.

Notes: r is the interest rate applied to weekly main refinancing operations. Starting on 28 June 2000 that rate corresponds to the minimum bid rate in a variable rate tender.

π is HICP inflation.

$\Delta\pi$ is the cumulative change in inflation since the last Council meeting

Δr is the Council decision.

that the ECB had been on the loose side in its first year of operation and had later adopted a tighter stance.

Next we look in more detail at the time pattern of changes in interest rates and their relationship to developments on the inflation front. We start by putting forward a simple benchmark model for the setting of interest rates by a central bank concerned with stabilization of inflation around a certain target.[1]

4.2 A benchmark interest rate rule

As a *benchmark*, we postulate a simple rule that defines a nominal interest rate target as a function of the deviations of inflation from an inflation target. Formally:

$$r_t^* = \rho + \pi^* + \phi\,(\pi_t - \pi^*)$$

where r_t^* denotes the nominal interest rate implied by the rule for period t given a rate of inflation π_t over the previous twelve months. The rule is defined by three parameters: ρ is the (long-run) steady-state real rate, π^* is the (long-run) inflation target, and ϕ measures the strength of the response to changes in inflation.

This rule, which we henceforth refer to as the π-rule, can be viewed as a simplified version of the so-called Taylor rule. The simplification consists in omitting, at least in a first pass, an output gap term that is also present in the latter. Our justification for adopting a π-rule as a benchmark is threefold. First, the construction of suitable output gap measures is full of practical and conceptual difficulties since, as we have argued in Chapter 1, potential output moves around all the time. Second, a π-rule would seem to be more tightly connected with the ECB's primary objective (the maintenance of price stability) and its subsequent quantitative definition by the Governing Council. Finally, we have shown that the central bank need not worry about the output gap: the change in inflation is a sufficient indicator for deciding when interest rates should be changed.

We start by calibrating the parameters of the π-rule in a way consistent with some of the ECB's statements, as well as independent evidence. We choose a baseline setting for the inflation target π^* equal to 1.5%. That value is the mid-point in the range of inflation rates consistent with the ECB's justification of a 4.5% reference value for M3 money growth.[2] We assume a baseline value of 1.5 for parameter ϕ. That coefficient is

1. The exercise that follows can be seen as an extension of a related analysis presented in *MECB2* last year, though many of the details differ.
2. The assumptions underlying the reference value for M3 growth are a trend real GDP growth between 2% and 2.5% and a trend decline in M3 velocity of between 0.5% and 1%. As argued in Svensson (2000), when combined with a 'reference value' for M3 growth of 4.5%, the previous assumptions yield a 'reference target' for inflation between 1% and 2%. See ECB *Monthly Bulletin*, November 2000 for details.

consistent with many of the empirical interest rules for Germany and Europe estimated using pre-EMU data.[3] It also corresponds to the inflation coefficient in Taylor's original rule describing Fed policy under Greenspan.[4] Finally, we calibrate the steady-state real rate ρ in a way consistent with the choice of a 3% interest rate at the launch of EMU, in the face of a (stable) inflation rate of about 0.8% in the euro area in the second half of 1998. Combined with the settings for the other parameters, that procedure yields a value for ρ of about 2.5%.[5] This value is not far from the average short-term real interest rate observed in pre-EMU Germany, which was 2.8% over the period 1960–98.[6]

Figure 4.1 A benchmark rule

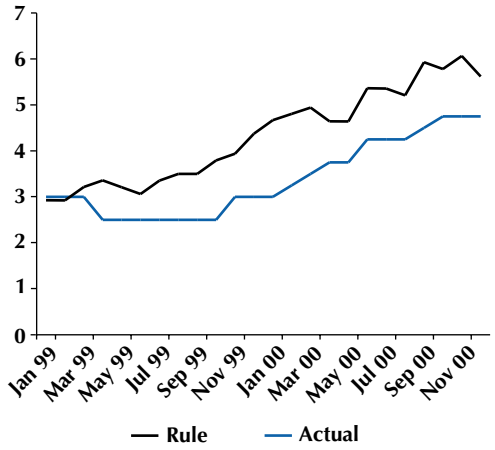


Figure 4.1 represents the interest rate on main refinancing operations set by the ECB over the period January 1999 to December 2000, together with the rate implied by our calibrated π-rule, given the euro area inflation over the same period.

By construction, the two series approximately coincide in the early months of 1999. This implies that the stance of monetary policy in the beginning of EMU was roughly in accordance with the rule. But the rate cut of April 1999 starts opening a significant gap between the two series. That gap appears to grow for protracted periods of time, reaches a peak of more than 160 basis points in January 2000 and had not been fully closed by the end of 2000.

In the remainder of this chapter we consider a number of hypotheses that may account for the deviations from the benchmark rule and try to evaluate their plausibility.

Hypothesis 1: an ECB soft on inflation

Figure 4.2 A soft ECB?

Our earlier comparison of the cumulative changes in inflation and interest rates over the first two years of EMU might suggest that the ECB has been rather soft in the way it has responded to inflation. In the context of our π-rule, that hypothesis would be reflected in a value for the inflation coefficient ϕ lower than the one assumed in our baseline calibration. To evaluate that possibility, Figure 4.2 displays the rate implied by our rule under the alternative assumption that $\phi = 1$, together with the actual interest rate.[7]

Interestingly, under the assumption of a unit inflation coefficient, our simple rule matches the actual interest rate both at the beginning and at the end of the period considered. But, as is clear from the figure, that assumption cannot by itself account for the persistent discrepancy between the rule and the actual

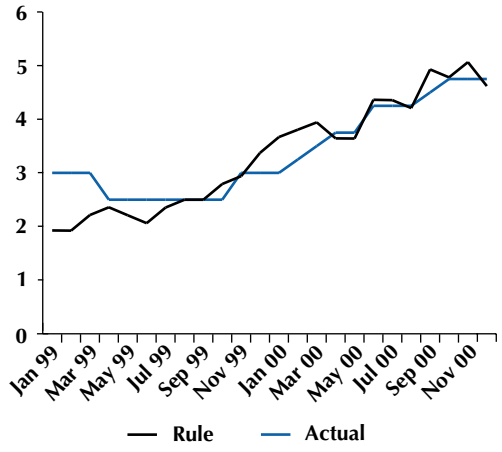
3. See, for example, Clarida, Galí, and Gertler (1998), and Gerlach and Schnabel (2000).
4. See Taylor (1993).
5. Notice that $\rho = r_t^* - \pi^* - \phi(\pi_t - \pi^*) = 3\% - 1.5\% - 1.5(0.8\%–1.5\%) \approx 2.5\%$.
6. Source: ECB *Monthly Bulletin*, March 1999.
7. The parameter ρ is adjusted accordingly to 2.25 so that the actual interest rate roughly matches the one implied by the rule in January 1999.

rate. That discrepancy originates largely from the April 1999 decision to cut rates at a time of growing inflationary pressures. The gap between the two series eventually closes at the end of our sample, suggesting that – albeit with a significant delay – the ECB has matched the cumulative increase in inflation since early 1999 with a roughly one-for-one increase in the nominal rate. That observation should not be particularly reassuring: it suggests that growing inflationary pressures are not being met with an increase in the real interest rates that would be necessary to stabilize the economy and which would require an inflation coefficient strictly greater than one.

Hypothesis 2: a low steady-state real rate?

Figure 4.3 displays the interest rate implied by our inflation-based rule when we lower our assumed value for the (long run) real rate by 100 basis points, from 2.5% to 1.5%, while keeping the remaining parameter values of our benchmark rule unchanged. The picture that emerges under this alternative assumption calls for a rather different interpretation of the ECB's stance and decisions during the first two years of EMU. First, and most interestingly, we see that at the beginning of EMU, for about three months, the ECB pursued a significantly tighter policy than called for by our rule. In other words, it seems as if the ECB would have deliberately sent a strong signal to markets of its commitment to price-stability, even in the face of little-disguised political pressures to help revive an, at that time, stagnant European economy. The choice of such an unusually tight stance would have surely facilitated the convergence of interest rates, for several soon-to-be EMU members had rates between 4 and 6% only a few weeks before the start of EMU.

Figure 4.3 A low equilibrium real rate



The assumption of a low steady-state real rate suggests a different interpretation of the decision to lower interest rates in April 1999 (in spite of the unfavourable developments mentioned above): that decision would have brought the ECB's stance in line with our simple rule and would have kept it on track from then on, as Figure 4.3 makes clear.

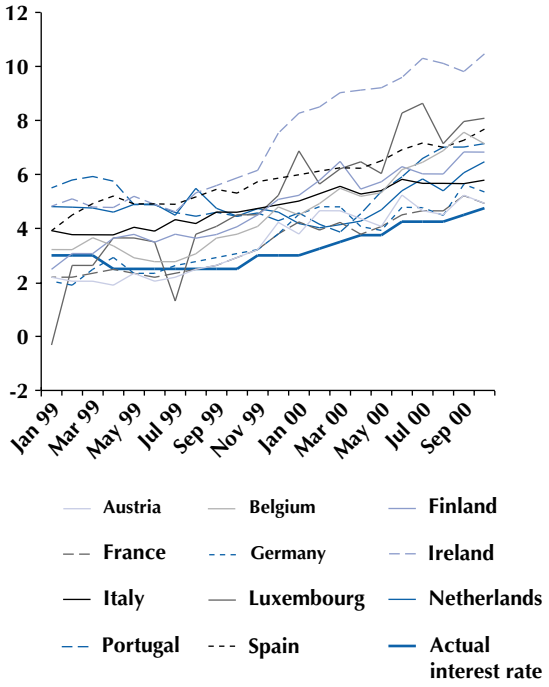
We do not think, however, that the present hypothesis should be given much credence. There are at least two reasons to rule it out. First, the assumption of a steady state interest rate of 1.5% does not seem to be justifiable. The ECB analysis itself, based on the historical record, points to interest rates that are well above that value (and, in many instances, above our benchmark assumption of 2.5% as well).[8] Second, we are not aware of any explanation by the ECB itself that would be consistent with the interpretation of its policy that comes out of the previous exercise. Both the exceptional nature of the early months and the

8. See, for example, ECB *Monthly Bulletin*, March 1999.

dramatic change of course in April 1999 would certainly have called for a clear and public explanation (perhaps after the fact) by any bank with any legitimate claim to being transparent.

Hypothesis 3: asymmetric inflation developments within the euro area

Figure 4.4 One size does not fit all

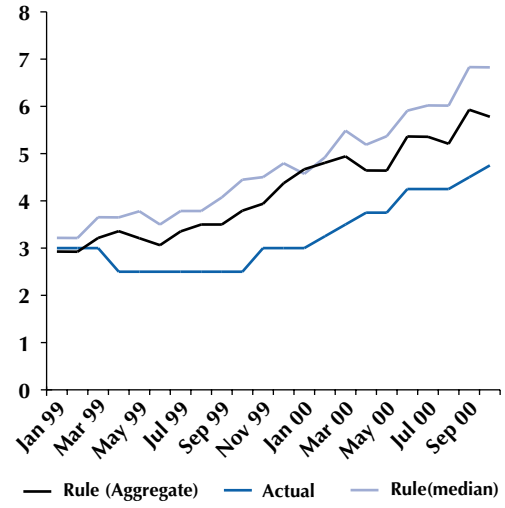


The existence of important inflation differentials within the euro area is often pointed out as a potential source of conflict within the ECB's Governing Council. In particular, it is argued that the 11 (now 12) NCB governors might choose to pursue exclusively their national interests and push for interest rate decisions that are consistent with inflation in their home country, rather than in the euro area as a whole. The potential extent of that conflict is illustrated in Figure 4.4, which displays the interest rates implied by our simple π-rule (under the baseline calibration), given each country's rate of inflation.

Notice that the interest rate set by the ECB at the beginning of EMU falls right in the middle of the distribution of interest rates implied by the respective national π-rules at that time. Yet, under our assumed benchmark rule, the magnitude of the discrepancies among 'desired' interest rates is considerable and does not seem have vanished over time, with Ireland accounting for the largest deviation.

In a context of diverging national interests, it would be conceivable that the decisions made by the ECB's Governing Council might not correspond to optimal responses to euro area-wide inflation developments. Instead, they might reflect the interest rate preferences of the median country, i.e. the country whose preferred interest rate corresponds to the *median* of the distribution of preferred interest rates across countries at each point in time. Figure 4.4 appears to rule out that hypothesis, at least under the maintained assumption that the benchmark rule introduced above can be used as a measure of each country's optimal rate. The effective interest rate set by the Council has remained systematically below the optimal rate of a majority of countries most of the time (and below that of all countries since late 1999!). In fact, and as shown in Figure 4.5, the optimal interest rate for the median country has remained systematically above that generated by our calibrated rule on the basis of aggregate euro area data.

Figure 4.5 A median country rule



In other words, the assumption of nationalistic voting would have introduced, if anything, a contractionary bias in the ECB policy over the period considered. That is a consequence of the fact that, on average, smaller countries (Ireland, Portugal, Finland, Belgium) have experienced some of the highest inflation rates in the euro area. Such an implication is at odds with our earlier finding of an actual interest rate below the one called for by our calibrated rule.

The previous discussion ignores, however, the fact that in addition to the 11 governors of NCBs, the Council also includes the six Executive Board members. The latter may be safely assumed to base their interest rate preferences on the basis of euro area-wide inflation. If decisions were truly taken by majority voting (a circumstance that has been repeatedly denied in official statements), and given that a majority requires nine votes, Board members would have to convince just three governors from countries with inflation rates close to the aggregate to get on board. But in that case, we would expect the interest rate set by the ECB not to differ much from the one that was optimal on the basis of euro area aggregates, an implication that Figure 4.1 would seem to reject.

Hypothesis 4: preferred partners?

Figures 4.6a and 4.6b show two alternative measures of the discrepancy between each country's benchmark-rule-based interest rate and the actual euro area rate. The first measure corresponds to the average gap between the two series, while the second is the mean of the squared gap.

As Figure 4.4 already hinted, the average interest rate gap has been positive for every EMU country, as well as for the euro area as a whole. More important for our purposes, the magnitude of the deviations has been far from uniform across countries. In particular, both measures point to a rather striking phenomenon. Taking our calibrated rule as a benchmark, the ECB appears to have pursued an interest rate policy that has been more attuned to inflation developments in three countries (France, Germany, and Austria) than to those in the euro area as a whole. By contrast, the size of both gap measures is particularly large for Ireland (and, to a lesser extent, for Spain). The large average inflation differential with respect to the euro area experienced by both countries accounts for the deviation.

Figures 4.7 and 4.8 illustrate the previous point by displaying our benchmark rule-based interest rate in France and Germany, as well as the actual interest rate over the first two years of EMU.

Figure 4.7 is constructed under our baseline assumption of a 2.5% long run steady-state real rate. This guarantees that the interest rate chosen by the ECB at the beginning of EMU is consistent with the benchmark rule applied to the euro area as a whole. Under this scenario, we see that during the first few months of EMU, policy is somewhat tight relative to the needs of Germany and France. With the April 1999 cut the correspondence gets closer (a point already noticed in *MECB2*, last year). We see how the three series move hand-in-hand over most of the sample period, with the exception of late 1999 and early 2000, when the rapid increase in inflation in Germany and France is not reflected in a sufficiently large interest rate rise.

Figure 4.6a Average interest rate gap

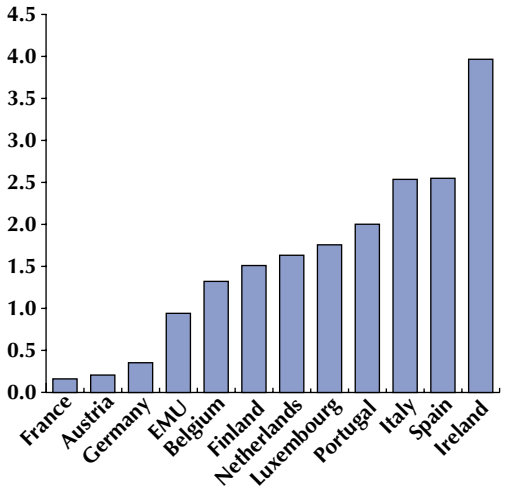


Figure 4.6b Mean-squared interest rate gap

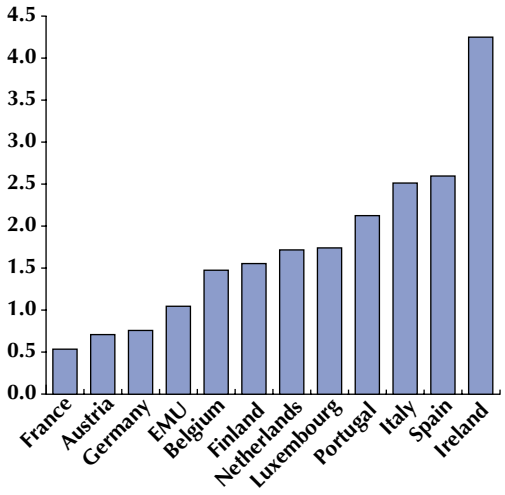


Figure 4.7 A policy with preferred partners? (real rate = 2.5%)

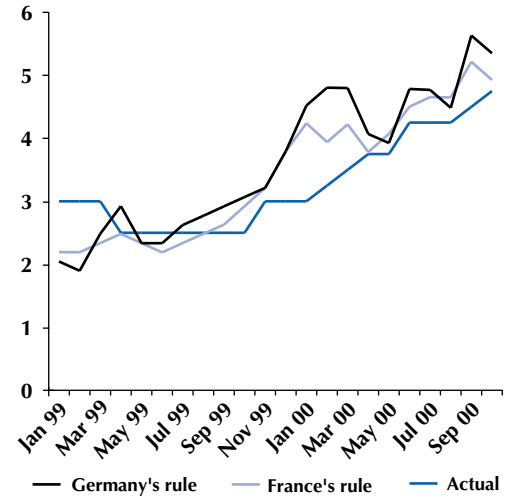
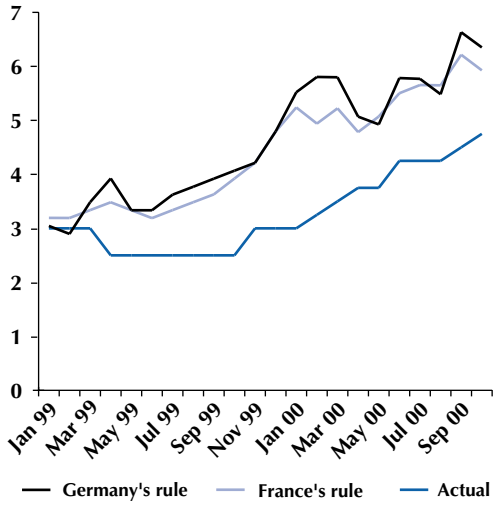


Figure 4.8 A policy with preferred partners? (real rate = 3.5%)



The previous interpretation changes when we calibrate the steady-state real rate in our interest rate rule so that the initial interest rate matches roughly the rule based on German and French data. That requires setting the steady-state real rate equal to 3.5%. Figure 4.8 displays the German and French rules under this scenario, together with the actual interest rate. The observed gap between the actual and desired rates is now much larger and, at least until early 2000, growing. Under our benchmark rule, therefore, the preferred partners hypothesis can be reconciled with the data only after the April 1999 cut, and even then it cannot account for the muted interest rate responses in late 1999 and early 2000.

Hypothesis 5: output gap concerns

Here we consider the possibility that the ECB would have based some of its interest rate decisions partly on real activity indicators, as well as inflation. With this purpose in mind we construct a time series for the interest rate implied by the Taylor-type rule:

$$r_t^* = \rho + \pi^* + \phi\,(\pi_t - \pi^*) + \gamma(y_t - y_t^*)$$

where the extra term represents the output gap in the euro area, i.e. the percentage deviation of output from some measure of potential output. We introduce the output gap in the interest rate rule not because we believe that this is right (in fact, we argued before, it is not great) rather because we believe that this is the variable the ECB might have considered. We use the output gap measure described in Fagan et al. (2001) and extended through the third quarter of 2000 under the assumption of a 2.25% growth rate in potential GDP. The output gap coefficient is set to 0.5.[9] Again, we adjust the value for ρ so that the rate implied by the rule in January 1999 is 3%.

Figure 4.9 A rule augmented with the output gap

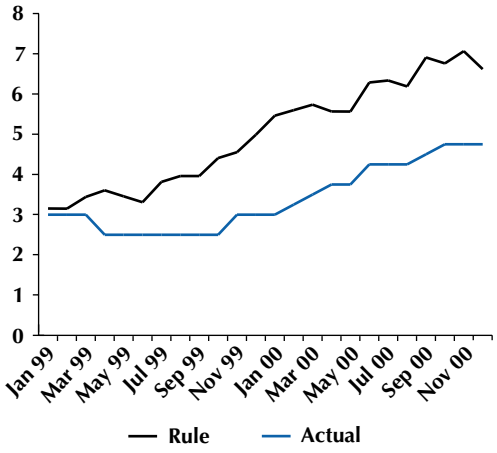


Figure 4.9 displays the interest rate implied by the augmented rule together with the actual rate set by the ECB. With the exception of the first half of 1999 – a period for which the augmented rule appears to fit the data better – the evolution of the output gap in the euro area works in the wrong direction. In particular, the steady increase[10] in the output gap since the beginning of EMU would have called, if anything, for a tighter policy than that implied by our baseline rule based on inflation only.[11]

9. From the discussion that follows it should be clear that the choice of alternative (positive) values would not lead to different results.
10. Remember that throughout our sample the output gap is a negative number: output is always below potential, so an *increase* in the gap means that output is coming *closer to potential*.
11. Notice that the possible influence on ECB policy of concerns about the external value of the euro can be dismissed on similar grounds.

The inability of output gap considerations to account for the apparent looseness of ECB policy detected in our analysis becomes obvious when the behaviour of the output gap over the period is examined. While remaining negative throughout the period, the measure of output relative to potential has increased monotonically from about –1.5% in the first quarter of 1999 to roughly zero in the third quarter of 2000. Hence, if anything, the evolution of the output gap should have led to a steeper rise in interest rates than that implied by our benchmark rule, making the resulting discrepancy with observed interest rates even larger.

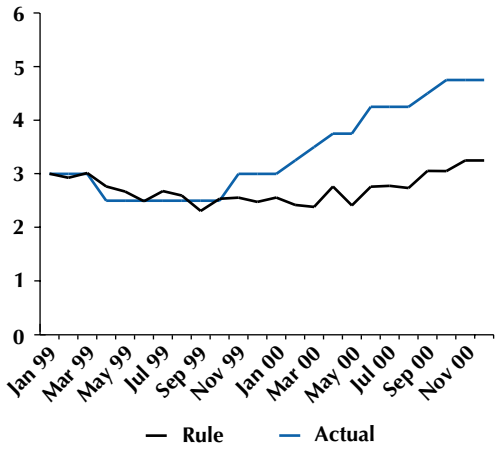
Hypothesis 6: focus on core inflation

The rise in oil prices, combined with the depreciation of the euro with respect to the US dollar, are often blamed for an important proportion of the increase in HICP inflation in the euro area over this period. To the extent that such a component is perceived to be transitory (as the ECB has frequently stressed) an automatic interest rate response to its movements may no longer be warranted.

Could the discrepancy between headline and core inflation explain the apparent looseness of monetary policy? We assess this hypothesis by comparing the pattern of interest rates set by the ECB over the past two years with those implied by our simple π-rule (under the baseline calibration), with a measure of core inflation for the euro area replacing the HICP inflation used above. In order to do that we construct a core inflation measure by removing energy and unprocessed food items from the official HICP inflation rate.[12]

Figure 4.10 displays the outcome of the exercise. Interestingly, the evolution of core inflation appears to explain very well the behaviour of the ECB during most of 1999 (including the April decision), but does not account for the size and frequency of interest raises in late 1999 and 2000.

Figure 4.10 A rule based on core inflation



Hypothesis 7: a forward-looking policy?

We finally consider the possibility that the ECB may have set interest rates on the basis of expected inflation instead of realized inflation.[13] We construct measures of expected inflation on the basis of the forecast for HICP inflation in the euro area published by *The Economist,* which in turn is based on their own

12. Matching the initial interest rate requires setting the steady-state real rate to 1.75% in this case, a rather low number.
13. See Clarida, Galí and Gertler (1998, 2000) for evidence on forward-looking interest rate rules for the US and several OECD countries.

Figure 4.11 Three inflation measures

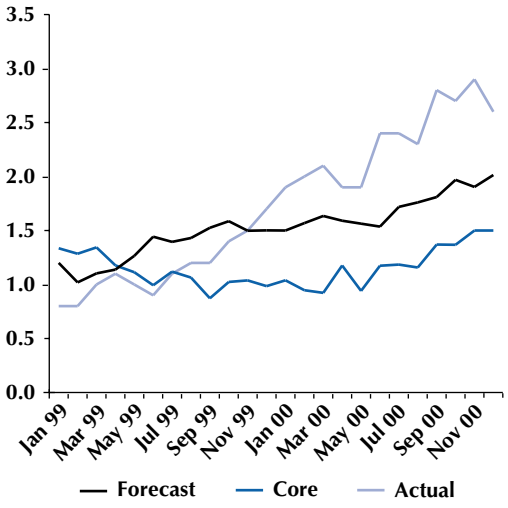


Figure 4.12 A forward-looking rule?

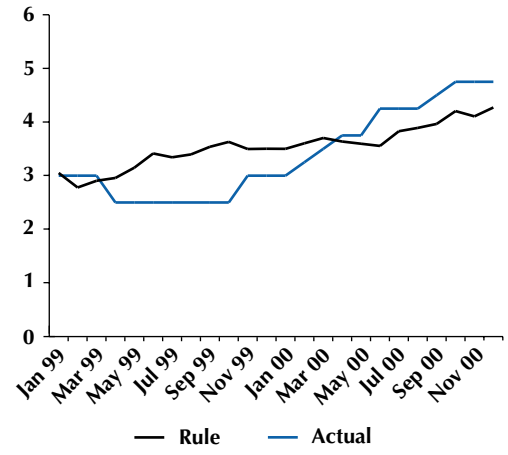
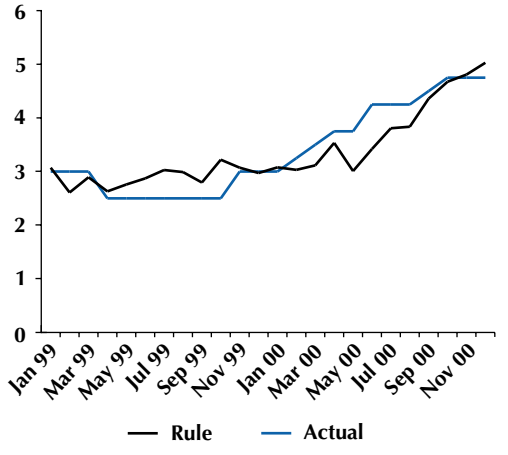


Figure 4.13 A hybrid rule



poll of forecasters.[14] Our measure of expected inflation, however imperfect, shows a pattern quite different from both realized (past) inflation and core inflation. This is illustrated in Figure 4.11, which displays the evolution of the three inflation measures over the first two years of EMU.

The fact that the inflation forecast lies mostly in between actual and core inflation, suggests that this variable may indeed help explain ECB interest rate decisions.

Figure 4.12 shows the interest rate implied by the forward-looking version of our rule together with the actual rate set by the ECB during the period. Clearly, the rule based on expected inflation appears to match the overall pattern of actual interest rates significantly better than the rule based on past realized inflation shown in Figure 4.1. Though some persistent discrepancies remain (especially for the months following the April 1999 cut), by the second half of the period the interest rate catches up with, and indeed appears to overshoot, the interest rate implied by the forward-looking rule. The reason for this finding is simple: while actual inflation had increased by 200 basis points from January 1999 to the date when the last interest rate adjustment took place, our inflation forecast measure had risen only by 80 basis points. Hence, the increase in interest rates that the forward looking rule calls for is much smaller (and more in accordance with what we have observed) than the one associated by our benchmark (backward-looking) rule.

Hypothesis 8: a hybrid rule?

None of the simple rules considered so far seem to provide a satisfactory account of the pattern of interest rate changes observed during the first two years of EMU. But some informal exploration of the data suggests a hybrid rule. This rule has the Central Bank respond quite aggressively (with a coefficient as high as 2) to *both* core inflation and the inflation forecast (both expressed in terms of deviations from target, and receiving equal weight). It appears to track much better the actual pattern of interest rates in EMU than any of the other rules considered. As in our benchmark rule, a steady-state real rate of 2.5% is needed in order to fit the initial interest rate. The behaviour of core inflation accounts for the loosening of policy in the middle of 1999. The use of expected inflation (as opposed to realized inflation) helps explain the relatively modest rate increases since November 1999 in the face of rapidly rising inflation.

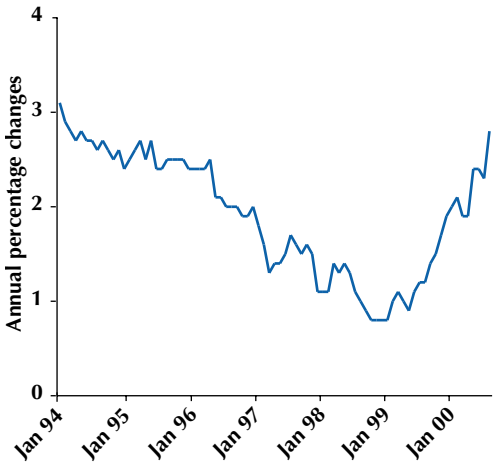
14. The forecasts of average annual inflation rates are for *calendar* years and, therefore, part of the published forecast for 2000 inflation as of June 2000 includes a component of past inflation. We partly correct for that distortion by subtracting from the forecast the sum of realized inflation rates from January 2000 to June 2000, and then computing a weighted average of: (a) the remaining component for 2000; and (b) the forecast for 2001, with the weight on the first proportional to the number of months left until the end of 2000.

Further data and the possible occurrence of future episodes when core and forecast inflation deviate significantly from one another, will help us assess the extent to which a simple but largely *ad hoc* hybrid rule, like that postulated here, can continue to track closely ECB interest rate decisions.

5

Monitoring the ECB

Figure 5.1 Inflation (HICP) in the euro area



Source: Eurostat

5.1 Inflation

The ECB has stated several times that its goal is to maintain inflation (defined as an increase in the HICP in the euro area) within a 0–2% range. Figure 5.1 shows that inflation rose steadily from January 1999, from less than 1% to 2.6% in December 2000, at which time the ECB judged headline inflation to be likely to remain above 2% for some time to come, even with a decline in oil prices.

Has the ECB missed its target and therefore lost credibility? It would be easy to come to that conclusion looking at this evidence, but that would be quite simplistic. Our analysis in Chapter 4 shows that the behaviour of the ECB can be described by a hybrid Taylor-type rule that responds to both core inflation and the inflation forecast. Thus, the current high rate of inflation, relative to target, is justifiable because of an expectation of lower inflation in the near future. In fact, the December 2000 *Bulletin* of the ECB (p. 29) projects an inflation rate close to 1.5% at the end of 2001. Oil prices have fallen significantly since November 2000, and the recent rise in the exchange rate may further subdue inflation, so that the consensus forecast for HICP inflation in 2001 (as of January 2001) is 2%.

The implication of the rule the ECB seems to follow is that one cannot expect to see inflation strictly below 2% at any point in time, even though this target is maintained for the medium run. In his statement to the Committee on Economic and Monetary Affairs of the European Parliament on 23 November 2000, Wim Duisenberg argued that firms and unions should not set prices and wages based headline inflation:

> It needs to be recognized that current upward pressures on consumer prices can be alleviated most smoothly if economic agents see them for what they are, namely one-off or temporary price increases resulting from external factors. In this respect, when forming their expectations,

economic agents should count on the commitment of the Governing Council of the ECB to maintaining price stability, defined as HICP inflation below 2%, in the medium term.

Can we then give full marks to the ECB in terms of its achievement on inflation? Obviously, two years of data are not enough to form a firm opinion. The ECB, however, has shown, overall, good judgment in its actions. If there is a problem, it is the link between what it says and what it does. The two-pillar strategy, the initial reluctance to publish its own inflation forecast, and a somewhat vague notion of what the 'medium term' is (referred to in the Duisenberg statement quoted above), have not helped to make it easy to understand the ECB strategy. The recent decision (discussed below in section 5.4) to publish inflation projections is a step in the right direction.

Should the ECB have been stricter in fighting inflation? Among some politicians and some of the public the Bank has a reputation for being excessively concerned about inflation and not sufficiently worried about unemployment. This is not consistent with the evidence. If anything, we have to seek reasons for why the ECB has shown a certain amount of flexibility in interpreting its mandate of price stability. Overall, we give a positive evaluation of this flexibility. Obviously, the ECB should not lose track of its target of 0–2% inflation, otherwise inflationary expectations would start being built into contracts and credibility would be affected.

5.2 The exchange rate

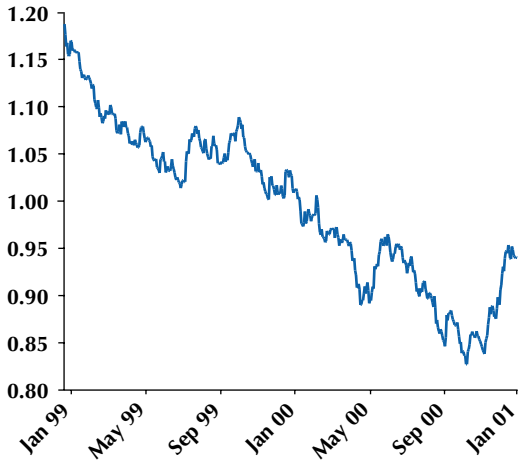
The euro has been much in the news. First, because of its persistent depreciation against the dollar (from a peak of $1.19 per euro in January 1999, to a low of $0.83 in October 2000), lately because of its partial recovery (see Figure 5.2). The euro's wild ride has coincided with a period of very high volatility in financial markets, and there cannot, and should not, be excessive concern over all of the ups and down of every market.

The European press and European policy-makers have been obsessed with the behaviour of the euro, for reason that have more to do with misplaced European pride than sound economic arguments. Some of the politicians and journalists who complained about a falling euro would also complain about high interest rates.

The euro–dollar exchange rate is a useful input in assessing inflationary developments, but it is not a measuring stick by which to evaluate the success or failure of the ECB. In fact, the falling euro has been good for Europe's export industry and a welcome stimulus to the ailing European economy.

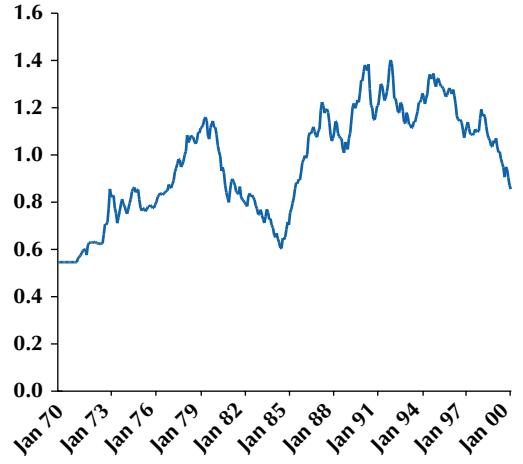
Are the fluctuations of the euro since January 1999 unusual? Or are these swings fairly normal in the light of history? A quick look at Figure 5.3 shows that the latter is true.

Figure 5.2 Exchange rate: dollar per euro



Source: IMF, International Financial Statistics

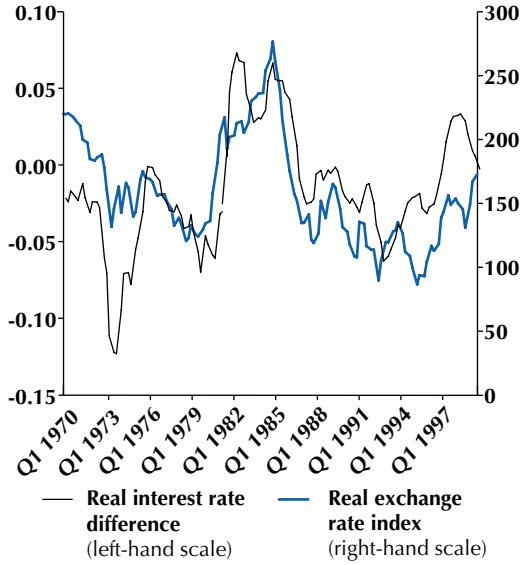
Figure 5.3 Long-term euro(DM)–dollar exchange rate



Source: IMF, International Financial Statistics

Figure 5.3 should vastly deflate the rhetoric that has accompanied the behaviour of the euro in the last two years. Nevertheless, while the European obsession with the exchange rate is excessive, it is still worth discussing possible explanations of the history of the euro in its first two years of existence.

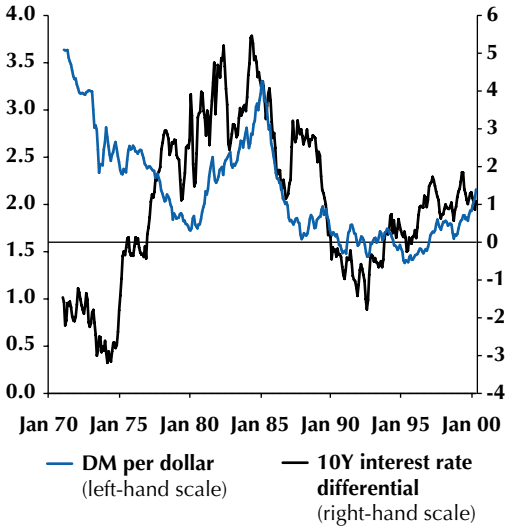
Figure 5.4 United States versus Germany: the real exchange rate and the 3-month real interest rate differential



Source: IMF, International Financial Statistics

Note: Real interest rates and the real exchange rate are both constructed using producer prices. The real exchange rate is normalized to 100 in 1995.

Figure 5.5 The DM–dollar exchange rate and the long-term German–US interest differential



Source: IMF, International Financial Statistics

Arbitrage in assets: interest rates differentials

There is substantial co-movement between the *real* short-term interest rate differential and the *level*, rather than the change, of the *real* DM–dollar exchange rate, using producer rather than consumption price indices for both. In Figure 5.4, the real exchange rate has been calculated as the appropriate sum of logs, whereas the calculation for the real interest rate uses a moving centred five-month window of PPI-inflation rates.

Using the current interest differential to predict where exchange rates will go is not particularly instructive. For instance, the short-term interest rate differential for 3-month deposit rates on 29 December 2000 predicts an appreciation of the euro relative to the dollar of about 0.4% from January to March 2001. Clearly, this is not particularly useful information.

For long maturities and the DM–dollar exchange rate, interest rate differentials and exchange rates are similarly highly correlated. As Figure 5.5 shows, the relationship between the long-term interest differential and the exchange rate is indeed quite close. Changes in the long-term interest rate differential have the potential to influence exchange rates greatly. Judging by the figure, an increase in the US bond rates *vis-à-vis* the the euro rates of less than 2% would have been enough to create the euro decline from January 1999 to November 2000. Unfortunately, this explanation does not help in understanding recent events – the long-term interest differential has remained fairly stable between 1998 and 2000. Something else must be at work.

Growth differentials

During most of 1999 and 2000, report after report showed that the growth gap between the United States and Europe was growing wider than previously expected. The European economy was not recovering quite as well as hoped and the US economy was continuing its amazing ride for longer than expected. At the same time, the euro continued to decline relative to the dollar. Since the end of 2000, however, the US economy's amazing ride has shown signs of ending and the euro has begun to appreciate against the dollar.

The link between recent euro–dollar exchange rate movements and the (survey-based) revisions of the forecasts of the growth rates of output in the US and in the euro area has been pointed out by Corsetti and Pesenti (1999), and Corsetti (2000). The

main point is made in Figures 5.6 and 5.7, which are updated versions of the ones shown in those papers.[1]

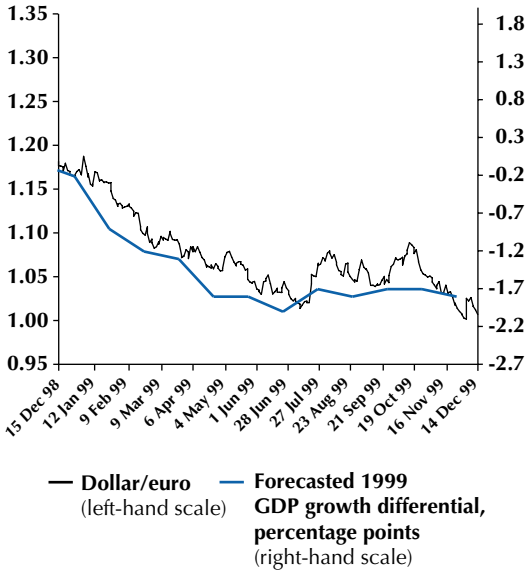
What could explain these correlations? The Balassa–Samuelson effect, described earlier in this report, can indeed account for real appreciation of the currency of a country whose productivity in the tradable sector grows faster. An anticipated Balassa–Samuelson effect in the future could also be turned into a real exchange rate appreciation now. As we have already argued, however, these effects are likely to be small compared with the exchange rate fluctuations observed. Expectations about future growth differentials may also affect expected interest rates differentials.

If the story of revisions in relative growth rates works for the euro–dollar rate, however, it certainly does not work for the yen–dollar rate. Neither did it work for DM–dollar rate in other periods. De Grauwe (2000) suggests that the correlation between the euro–dollar rate and growth forecast revisions observed during 1999 and 2000 has more to do with the psychology of traders than it has with fundamentals. What seems to happen is that a protracted movement of the exchange rate in one direction sets in motion a search for fundamentals that are able to explain such a movement. If news about a relative strengthening of the US economy seems to be correlated with an appreciation of the dollar relative to the euro, any gain by the dollar will be accompanied by a search for good news about the US economy that could explain it, disregarding any news that could work in the opposite direction – such as a deteriorating current account position, for instance. Parallel to this, analysts will search for bad news about Europe. The process may snowball. At some point, however, comes news that brings analysts to reconsider their views. This suggests that one should not try to 'over-explain' or worry too much about fluctuations of the exchange rate.

In the same spirit, it is worthwhile remembering that the value of a currency also depends on the decisions of agents who can use either dollars or euros in their transactions. For example, if international oil traders decided to invoice in euros rather than dollars, that would increase the demand for euro and drive up its value. Payment habits normally depend on past history; but sudden shifts, though rarely observed, could introduce in the exchange rate an element of indeterminacy.[2] In short, exchange rates may fluctuate purely due to changing international payment habits rather than any fundamental events.

1. *MECB2* in 2000 also made the point that real shocks drive the euro–dollar exchange rate.
2. This possible source of indeterminacy was originally pointed out by Kareken and Wallace (1981). The role of the euro as an international reserve currency has been studied by Portes and Rey (1998).

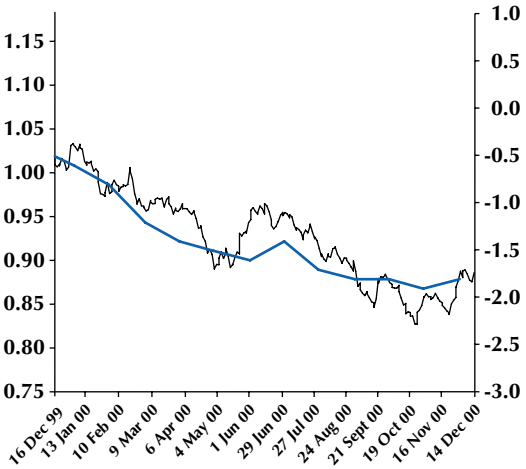
Figure 5.6 Revisions in expectations of the 1999 euro area–US growth differential and the euro–dollar exchange rate



Source: *Consensus Forecasts* (Consensus Economics, London) and ECB.

Note: This is an updated version of the chart presented in Corsetti and Pesenti (1999)

Figure 5.7 Revisions in expectations of the 2000 euro area–US growth differential and the euro–dollar exchange rate



Source: *Consensus Forecasts* (Consensus Economics, London) and ECB.

Note: This is an updated version of the chart presented in Corsetti and Pesenti (1999)

5.3 The ECB and the exchange rate of the euro

For a while, the ECB treated the exchange rate with benign neglect. It has argued, correctly, that its task is to maintain price stability in the euro area, not to target a particular exchange rate. But in September 2000, an intervention by the ECB and the Federal Reserve to shore up the weak euro was publicly discussed and then implemented for the first time. The effect was only fleeting: after a short blip, the euro depreciated even further. This episode should have silenced the interventionist critics of the ECB. The decline of the euro stopped only with news that the economy in the United States has started to slow down.

Should the ECB be concerned about exchange rate fluctuations? And even if it were, could it do something about it?

The conventional answer is a qualified no. No, because official interventions are small in comparison to the amounts traded daily on the foreign exchange rate markets. No, unless the Bank's intervention signals a shift in policy and such a signal is enough to change market beliefs.

Even without this signal, it is conceivable that the pessimism of the conventional answer may be exaggerated. There is evidence that large private traders can have an effect on the exchange rate. Their trades are typically smaller than those of a central bank, so its trades, even if unaccompanied by a change in interest rates, should matter too. The presumption is still that these effects are short-lived. They could, however, lead to different conclusions if it is believed that noise traders drive the foreign exchange markets. In such a market non-linearities occur which can lead to permanent effects of small disturbances. These issues are at the frontier of research and we know too little at this point to draw firm conclusions, and thus we must remain very cautious in using these results for policy prescriptions. We analyse these issues in Boxes 5.1 and 5.2.

The safest strategy for the ECB is to encourage a cooling of the exchange rate obsession of Europeans. Explaining to the public that a successful currency is one that produces low inflation, not one that produces high exchange rates, is a good strategy. Achieving a low inflation rate, however, does not mean that the ECB should ignore the exchange rate. Via imports and exports, the exchange rate obviously has an impact on inflation. In judging inflationary pressure, the ECB therefore needs to take exchange rates into account, like many other variables.

In a recent paper John Taylor (2001) analyses extended versions of Taylor rules with and without reaction coefficients to exchange rates. In particular, he compares a rule that in reaction to a 10% depreciation of the euro, increases interest rates by 2.5% now and lowers them by 1.5% later, to a rule that reacts to

BOX 5.1 Noise traders and one-way betters

The ECB used a novel argument for justifying its exchange rate intervention in November 2000. In his statement to the European Parliament on 23 November, Duisenberg said that interventions:

'are mainly used so as to break a prevailing thinking pattern, or philosophy, prevalent in markets whose market participants only have a one-way risk or a one-way street, which they can safely walk on. No, they have and should have, a two-way risk and that is what we hope to achieve.'

Is there a sensible interpretation of this statement?

In a world of rational investors and efficient markets, exchange rate movements above and beyond the interest rate differential plus some risk premium ought to be solely due to surprises. If this had been the case for the euro during 2000, namely a depreciation induced by a string of negative surprises, an intervention by the ECB would only have injected additional noise into the system. Certainly it could not be justified as a device to 'break a prevailing thinking pattern.'

But exchange rates may be too volatile to be explained by rational behaviour alone. Recent research[1] suggests that noise traders with biased expectations about the future exchange rate may enter the market and create greater volatility as a result. Multiple equilibria can arise with different degrees of volatility in the foreign exchange market. While this analysis does not give rise to one-way betters, it does provide a rationale for intervention: a central bank can eliminate the more volatile equilibria by intervening if the exchange rate gets too far out of line with fundamentals.

Can there be one-way betters? One way to make sense of Duisenberg's argument is to think that some traders follow rules-of-thumbs rather than rational economic reasoning, as some recent research argues.[2] Pursuing this line of research in the context of thinking about exchange rates may prove useful.

1. Jeanne and Rose (2000), Hau (1998).
2. Lettau and Uhlig (1999).

exchange rates only indirectly through their impact on inflation. He finds that the latter rule outperforms the former, which he attributes to the lower interest rate fluctuations. The bottom line is that it may be better to ignore exchange rate fluctuations for the purpose of setting interest rates.

5.4 Projections, benchmarks and forecasts

In a marked change to its previous position, the ECB has now decided to publish projections for inflation and other variables relevant for assessing monetary policy developments. This has been very high up on the wish list of academic ECB watchers, and we strongly applaud this development.

For the ECB, this is a new communication tool and, understandably, it has been introduced with a considerable degree of caution. At the Committee on Economic and Monetary Affairs of the European Parliament in November 2000, the President stated:

... the Governing Council does not use its staff projections as the main tool for organising and communicating its assessment. Rather, the Governing Council evaluates them alongside – and compares them with – many other pieces of information and forms of analysis organised in

BOX 5.2 The central bank, the public and the currency dealers: is sterilized intervention effective?

In a sterilized intervention, the central bank couples an exchange rate intervention with an offsetting domestic open market operation in order to keep interest rates unchanged. There are two channels through which sterilized intervention could move currency prices. First, by intervening in the forex market, the central bank can reveal new information to market participants. This could concern the state of fundamentals known to the central bank, but not yet observed by the public, or it could reveal the central bank's intentions about future moves in the policy variables it controls. In both cases this would lead market participants to revise their expectations, and currency prices to move. Second, a sterilized intervention could simply change the outstanding stocks of assets denominated in different currencies – if these assets are not perfect substitutes in the portfolios of investors, then an intervention will move prices.

Separating these two channels empirically is not easy. Yet it is important for a central bank to know whether the information channel is the only one that can move exchange rates. If this were the case, the effects would depend on the type of information the public extracts from the intervention, and on how it interprets it. In the end it might be easier to reveal the information directly, rather than through such a cumbersome device.

But can a central bank move the exchange rate if it is not prepared to signal a change in monetary policy? Recent research by Evans and Lyons (2000) makes important progress in solving this question. The trick is to forget central banks altogether, and simply ask if large currency trades, even private ones, have an effect on prices. The answer is positive – the impact on the dollar–DM exchange rate of a transaction worth $100 million is 5 basis points, and about half of this effect does not vanish, at least not immediately.[1] The Evans and Lyons sample includes no central bank interventions: the results are therefore independent of information effects of the type discussed above.[2]

The currency trades considered in this study are foreign exchange orders going through dealers, and the timing of the data is hourly. The market works as follows. Dealers transact with the public and these transactions are not public knowledge since each dealer only observes their own trades. As a result of these trades, dealers accumulate inventories. Since dealers typically do not carry inventories of currency from one day to the next, however, and also try to minimize their stock of inventories at each point during the day, they will attempt to share the inventory stock with other dealers and eventually to unload the currency back to the public.[3] This will move prices and thus price changes will depend on the volume of orders flowing among dealers. The reason is that these orders convey information on the unobservable transactions that lie behind them, and thus on the total volume of currency that dealers are accumulating and will have to unload eventually.

The finding that the effect of order flows on prices is somewhat persistent (i.e. lasts beyond the day after dealers have run down their inventories) is more troublesome. Evans and Lyons interpret this as evidence in favour of imperfect substitutability in private portfolios. Since the sample does not include central bank interventions, this would require that risk premia be a function of gross, rather than net asset supplies. An alternative explanation points to the role of institutional investors and their stop-loss rules (see also Box 5.1 on noise traders.)

Stop-loss rules determine when an investor closes the position, taking whatever loss has cumulated up to that moment. Such rules typically depend on the sum of two terms – the cumulated loss and the current value at risk, which is a measure of the potential loss. Interventions can move both terms, forcing investors to close their positions, thus further increasing the flow of orders. By moving the exchange rate, an intervention can affect the first term, i.e. it can directly produce a loss. By increasing the volatility of the foreign exchange market interventions also raise the value at risk for any level of the

1. It is useful to understand how these numbers are constructed. Evans and Lyons use tick-by-tick data on individual inter-dealer transactions carried out on the Reuters 2000–1 trading platform over a four-month period running from May to August 1996. These transactions cover about two-thirds of the worldwide dollar–DM market. Each data point contains information on the time of the transaction, whether the dealer was buying or selling and the transaction price. It does not identify, however, the size of individual trades. Using these data Evans and Lyons construct a flow variable – the difference between the number of buyer-initiated trades and those initiated by a seller. Then they run a regression of the hourly change in the exchange rate on the flow variable, a measure of price volatility (the standard deviation of prices during the previous hour) and a measure of trading intensity (the number of trades occurred during the previous hour). The impact of the flow of orders on prices is finally estimated transforming the number of trades into volumes using the average size of a trade in the sample.
2. Similar findings are reported in a study of Norwegian dealers by Bjønnes and Rime (2000): in their sample cumulative order flows and exchange rates are found to be cointegrated.
3. This is consistent with a simple rule – dealers end the day with zero inventories. A similar rule is confirmed by Bjønnes and Rime (2000) – 80% of the inventory that a dealer accumulates through a single trade is sold in the next trade, that is within a few minutes.

exchange rate. This is an additional channel that can force an investor to close the position.

The intervention in the euro–dollar market which took place in September 2000 provides an example of both. Figure B5.1 documents the impact of the intervention on the level of the exchange rate; Figures B5.2 and B5.3 document its impact on volatility. Notice that while the first effect was rather short lived, lasting no more than a week, the second did not vanish – the volatility of the 1-month forward euro–dollar exchange rate doubled from the day before to the day after the intervention (from 0.076 to 0.140) and remained higher thereafter (it was 0.269 on 31 October 2000).

Figure B5.1 Euro–dollar for calendar year 2000

Source: Used with permission from Bloomberg L.P.

Figure B5.2 Volatility of the euro–dollar exchange rate *the day before* the 21 September 2000 intervention (Distribution of the forward rate derived from the options market)

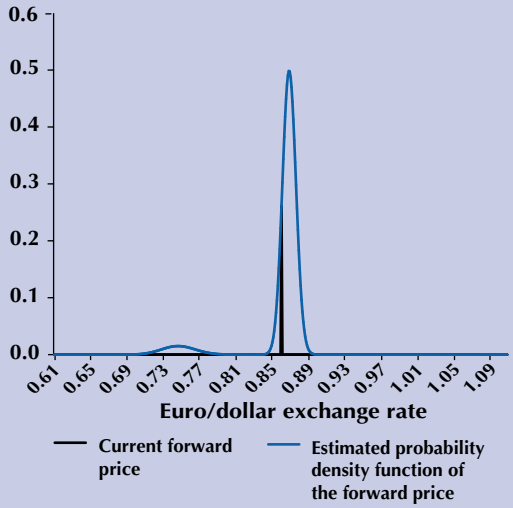
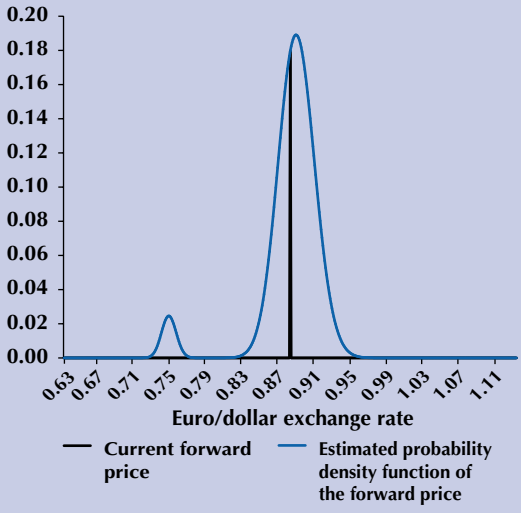


Figure B5.3 Volatility of the euro–dollar exchange rate *the day after* the 21 September 2000 intervention (Distribution of the forward rate derived from the options market)



the two-pillar framework. In the context of the ECB's strategy, macroeconomic forecasts and projections therefore play an important – albeit limited – role.

It is wise for central bankers to be prudent and sceptical – the new tool has to prove its worth before it can be entrusted as a pillar of monetary policy decisions. We expect that these projections will earn this trust and over time will start to play an increasingly prominent role in the internal policy debates of the ECB. They do so already at other well-run central banks such as the Bank of England and the Swedish Riksbank.

This development is logical. The policy aim of the European Central Bank is to maintain inflation in the 0–2% range. Since a change in interest rates today affects inflation with long lags, to choose policy now means to forecast inflation as a result of these choices. The two – choosing a policy and forecasting inflation (conditional on these policy choices) – are practically synonymous. The ECB has been, therefore, making inflation forecasts all along, it is only that to date, these forecasts so far were informal. We concluded in Chapter 4 that the ECB decisions seem to have been made in response to expected future inflation. The step taken now is to support this informal reasoning with a potentially more precise and more communicable tool.

That said, there remains an important issue to be resolved before these projections can be really useful. The ECB plans to construct its projections using a 'no-change-in-interest-rates' benchmark scenario – future inflation developments are computed under the assumption that the ECB will not change interest rates for, say, a year. The rationale is clear – if no change in interest rates results in inflation trending upwards, the ECB presumably will act to raise interest rates in order to keep inflation in check. This is the policy everyone expects the ECB to follow. The 'no-change-in-interest-rates' scenario is, therefore, one which nobody believes will happen – it is *not* the inflation forecast that the public will incorporate in their expectations.

To see this, consider a somewhat extreme example. When calculating these projections, assumptions must be made about the strategies of price and wage setters: assume that they believe that the ECB will always successfully achieve an inflation rate of 0–2%. Taking the resulting price- and wage-setting strategies as given, suppose that the no-change-in-interest-rates scenario predicts a rise in inflation to, say, 20%. Clearly then, the assumed beliefs for the price- and wage-setters were way too optimistic. Should they also assume that the ECB now wants to target 20% inflation? Clearly not. This issue may generate a certain amount of confusion.

Research over the last two decades has shown that pretty much anything can happen once the endogeneity of inflation expectations is taken into account (see for instance Sargent, 2000.) One could perhaps produce a no-change-in-interest-rates projection assuming that price- and wage-setters are continually surprised that the ECB is not trying hard to get back to its 0–2% target, while inflation slowly creeps up well beyond this range – but how easy would it be to communicate the very hypothetical nature of this projection? Put differently, unless keeping interest rates fixed happens to be exactly the policy that the ECB would wish to pursue, these projections have little to do with what would actually happen if the ECB were to leave interest rates wherever they are. There is no logically consistent way to produce them.

What, then, is the alternative? The alternative is to produce inflation and interest rate forecasts along the most likely future scenarios, using actual ECB policy – and that means allowing for interest rates to change along the forecast. Obviously, in order to do this the ECB would have to run various projections of interest rate policies as a function of different scenarios. For inflation, these forecasts might turn out to be almost a tautology, moving about within the 0–2% target range. More interesting would be the interest rate paths that the ECB will need to choose in order to keep inflation within the target, and the impact on growth and unemployment which results from this. Such forecasts, or scenarios, using the actual monetary policy, would be useful in many ways to markets, governments, firms and households alike. They would also allow easy communication and defence of temporary violations of the target range. As long as these are pre-announced and as long as the return to the target range is also pre-announced, nobody will see them as undermining the credibility of the ECB.

Any forecast is subject to uncertainty (see the Box 5.3 on how the ECB quantifies its uncertainty about inflation in 2001 and 2002). Future conditions will change and we all know that no-one, including the ECB, has a crystal ball. What is important is the nature of the uncertainty. The no-change-in-interest-rate projection will show zero uncertainty with regard to interest rates, and lots of uncertainty with regard to inflation. The truth, however, will be exactly the opposite.

BOX 5.3 Quantifying forecast uncertainty

The ECB has chosen a somewhat unconventional way to represent its uncertainty about future inflation. Its error bands are set at plus or minus the average absolute deviation, calculated on the basis of similar forecast exercises applied to past data. For a Gaussian distribution, this would imply a band of plus or minus 80% of one standard deviation, whereas it is customary to use a two-standard-deviation band. The latter would cover 95% of all observations, while the band chosen by the ECB covers less than 60%. In other words, there is a greater than 40% chance that the actual inflation rate will fall outside the stated range, given the assumptions of the projection.

While this may be a reasonable way of striking a balance between providing an informative projection and stating the underlying uncertainty, it would be useful for the ECB to clearly stress this aspect in their publications. If the customary two-standard-deviation error band were used, the ECB would have projected inflation rates in the range of 1.4–3.4% rather than 1.8–2.8% for 2001, and 0.4–3.4% rather than 1.3–2.5% for 2002, demonstrating the considerable degree of uncertainty typically contained in any forecast or projection exercise.

These customary ranges reinforce the point made in the text. Surely, if inflation rates were to bump up against the upper limit of these two-standard-error confidence bands, the ECB would have taken action towards containing inflation long ago. Put differently, there exists no procedure to calculate the standard deviations from data to be observed in the future and compare them to the standard deviations used by the ECB, because the standard deviations in the projection exercise concern data produced under the hypothetical no-change-in-interest-rates-regardless-of-what-inflation-actually-does scenario, which will never take place.

In summary, both for reasons of internal logical consistency as well as for reasons of showing the interesting dimensions of uncertainty, not the uninteresting ones, the forecasts should be made, and eventually published, using the predicted paths of interest rates, given the actual ECB policy of trying to keep in inflation in check. Everyone could then see where interest rates are headed and what will happen to inflation as a result. And that, clearly, is a good thing.

We realize that the ECB projections are not the only central bank forecasts subject to this critique – most central banks publish forecasts based on a no-change-in-interest-rates scenario. That does not mean that this approach is right. It is worth considering whether a correction of this policy is not a necessity.

5.5 Transparency

This is an old debate – should the ECB publish the council votes, as the Bank of England does? Should they publish detailed reports and minutes on the course of arguments and disagreements before a policy decision is taken? Or, why not take this argument to its ultimate conclusion – should the deliberations of the ECB be televised?

Televised council meetings may leave things just as opaque as they are now. Council members could agree on their votes at a dinner before their meeting and the meeting itself would be a mere, pre-agreed show for the viewers. Nothing would be gained, but efficiency would be lost. Replacing active but secret council debates by active but secret pre-meeting dinner conversations or pairwise telephone calls, can only make it harder for sensible policy-making. Indeed, we fear that these evasive actions and the corresponding efficiency losses are already happening whenever the Council meeting is attended by the president of Ecofin. This efficiency loss suggests that the president should not attend the ECB Council meeting. A similar argument can be made with respect to more detailed minutes or with counting of votes – there are always ways to avoid transparency, if the Council wishes.

So, the real question is: should the council want more transparency? Should they embrace the idea of making as much as possible known about their decision process? Or are there reasons why the ECB cannot do what the Bank of England does?

We believe there are. Suppose that the ECB published votes of individual council members who then, as national bank governors, will have to go back to face their national parliaments. It is fairly easy to see how, say, a German central bank governor might come under pressure if seen to have voted for an interest rate hike in the service of all Europe when this would not be the preferred choice for Germany alone. Because this national pressure exists, it may be wise to shield the Council

from it as much as possible. We want independence for the European Central Bank, and this independence implies independence from the need for individual council members to answer to their national parliaments as to how they voted – for now, at least. Over time, monetary policy discussions in Europe may become more pan-European and less focussed on the conditions of individual member countries. When this happens there will be nothing wrong with each council member explaining what they did and why.

It is hard to find good arguments, on economic grounds, for why the deliberations of the ECB should be shrouded in secrecy. The arguments must, therefore, be political in nature. If the political arguments can be held in check, the economic arguments for more transparency will carry more weight. The Council should make greater transparency part of its own long-term agenda. And in order to get there, they need to steer the monetary policy debates in the right, pan-European direction as indeed they have been doing for the last two years. The more the debate focuses on economics and the less it focuses on politics, the more open and transparent the ECB can allow itself to be.

5.6 The M3 pillar

The ECB monetary policy strategy rests on two pillars, according to the ECB. The first is the growth rate of M3, a monetary aggregate. The second is pretty much everything else that might influence inflation rates.

This official-speak has been criticized many times already. In this report we have added one dimension to the quest for clear, understandable rules. We have argued that any degree of uncertainty about the response of monetary policy to a move of the fiscal authorities would justify their call for taking decisions jointly, i.e. for formal coordination – a development we judge risky. Since the criticism remains valid, it is worth repeating it once again.

There are many indicators which may be useful for predicting inflation, and the growth rate of M3 may be a particularly useful one. Then again, it may not be. Since keeping inflation in check is the ultimate goal of the ECB, it is hard to see why the growth rate of M3 has a special role to play beyond that accorded to other good indicators. As Lars Svensson (2000, p.97) has put it, 'the first pillar is actually a brick.'

It may be argued that it is somewhat absurd to talk about monetary policy without talking about money. Should not the Central Bank be particularly observant of the developments of monetary aggregates? Are monetary aggregates not an important device for providing a nominal anchor for monetary policy? Yes. But this misses the point. The ECB should closely monitor developments of monetary aggregates. Its mission, however, is

to maintain price stability in the medium term. The growth rate of M3 can only be a servant in this quest and not a target in itself. Whether it is a useful servant or not is a question which has to be evaluated, just as for any other indicator capable of assessing inflationary pressure. To demonstrate the overriding importance of price stability, it would be useful to move the growth rate of M3 to the side.

This is not a moot issue. There are respected ECB watchers who believe that the ECB is a 'monetary growth-rate targeter' and who speculate that everything else is actually of minor importance in setting its policy. It would be good communication for the ECB to put a decisive end to these views. As for providing a nominal anchor, obviously there should be one. Money growth rates will do, but inflation targeting or inflation forecast targeting provides an even better nominal anchor. What is there to fear by replacing something good with something even better?

It is clear where the two-pillar strategy comes from. It is the result of a compromise to get the ECB council to agree the day the new institution was created on how to think about monetary policy. Some European central banks came from a time-honoured strong monetarist tradition that paid a great deal of attention to monetary growth rates. The ECB was preoccupied with being perceived as moving in the footsteps of the Bundesbank, of continuing with its formidable reputation as an inflation fighter. This certainly was a wise strategic choice. But now, the M3 pillar stands in the way of effective communication. We would not be surprised if the M3 pillar has already started to play less of a role in the internal debates. The ECB just needs to find a clever way to ditch this pillar in its public announcements too, without being seen as pursuing a new strategy.

The way out will come through the realistic scenarios and forecasts that we believe the ECB will eventually provide. They play only a minor role now (and currently only in the form of unrealistic no-change-in-interest-rate-no-matter-what projections), but as they are modified and become more and more useful, the Council and the public will pay increasing attention to them. The forecasts will become the main foundation for monetary policy decisions. The current pillars will provide just minor additional support. Perhaps, that's exactly what some Council members fear. They should not.

References

Alesina, A., S. Ardagna, R. Perotti and F. Schiantarelli (2000), 'Fiscal Policy, Profits and Investment', mimeo, Harvard University.

Alesina, A. and R. Perotti (1995), 'The Political Economy of Budget Deficits', IMF Staff Papers, 42, pp. 1–31.

Alesina, A. and R. Perotti (1997), 'Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects', IMF Staff Papers, 44, pp. 297–327.

Alesina, A. and R. Perotti (1997), 'The Welfare State and Competitiveness', *American Economic Review*, 87, pp. 921–39.

Beetsma, R. and H. Uhlig (1999), 'An Analysis of the Stability and Growth Pact,' *Economic Journal*, 109(458), pp. 546–71

Bjønnes G. H. and D. Rime (2000) 'FX Trading … Live ! Dealer behavior and trading systems in foreign exchange markets', mimeo.

Blanchard, O. and J. F. Jimeno (1999), 'Reducing Spanish unemployment under the EMU', (La reduccion del desempleo en Espana dentro de la UME), in *El Euro y SUS Repercusiones Sobre la Economia Espanola*, Fundacion BBV, pp. 41–90.

Buti, M., W. Roeger and J. Intveld (2001), 'Stabilising Output and Inflation in EMU: Policy Conflicts and Co-operation under the Stability Pact', mimeo, European Commission, Directorate General for Economic and Financial Affairs.

Clarida, R., J. Galí and M. Gertler (1998), 'Monetary Policy Rules in Practice: Some International Evidence', *European Economic Review*, 42, pp. 1033–67.

Clarida, R., J. Galí and M. Gertler (2000), 'Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory ', *Quarterly Journal of Economics*, 115(1), pp. 147–80.

Clarida, R., J. Galí, and M. Gertler (1999), 'The Science of Monetary Policy: A New Keynesian Perspective', *Journal of Economic Literature*, 37(4), 1661–707.

Corsetti, G. (2000), 'A Perspective on the Euro,' a CESIfo lecture, Munich

Corsetti, G. and P. Pesenti (1999), 'Stability Asymmetry and Discontinuity. The launch of European Monetary Union', Brookings Papers on Economic Activity 2, p.352.

De Gregorio, J. and H. Wolf (1994), 'Terms of trade, productivity, and the real exchange rate', NBER Working Paper No. 4807.

De Grauwe, P. (2000), 'Exchange Rates in Search of Fundamentals: The Case of the Euro–Dollar Rate', CEPR Discussion Paper No. 2575.

Dixit, A. and L. Lambertini (2000), 'Monetary–Fiscal Policy Interactions and Commitment Versus Discretion in a Monetary Union', Paper presented at the European Economic Association meetings in Bolzano, Italy, September.

Estrada, A. and J. D. Lopez-Salido (2001), 'Measuring Spanish technological change using sectorial data', mimeo, Banco de Espana.

Evans, M. D. D. and R. K. Lyons (2000), 'The price impact of currency trades: Implications for intervention', mimeo,University of California, Berkeley.

Fagan, G., J. Henry and R. Mestre (2001), 'An Area-Wide Model (AWM) for the Euro Area' ECB Working Paper No. 42.

FitzGerald, J., D. Duffy and D. Smyth (2000), 'Managing an economy under EMU: the case of Ireland', ESRI, Dublin, Working Paper No.127

Galí, J., M. Gertler, and J. D. López-Salido (2001), 'European Inflation Dynamics', *European Economic Review*, forthcoming.

Gerlach, S. and G. Schnabel (2000): 'The Taylor rule and interest rates in the EMU area,' *Economics Letters,* 67, pp. 165–71.

Giavazzi, F. and M. Pagano (1990), 'Can Severe Fiscal Contractions Be Expantionary? Tales of Two Small European Countries', *NBER Macroeconomics Annual*, pp. 75–122.

Giavazzi, F. and M. Pagano (1996), 'Non-Keynesian Effects of Fiscal Policy: More International Evidence and the Swedish Experience', *Swedish Economic Policy Review*, 3(1), pp. 75–111.

IMF Article IV consultation with Ireland, published, August 10, 2000, available on the IMF website.

Jacuet, P. and J. Pisani-Ferry (2000), 'La coordination des politiques économiques dans la zone euro: bilan et propositions', Rapport du Conseil d'Analyse Ecomique, No. 27, Paris.

Jeanne, O. and A. K. Rose (2000), 'Noise Trading and Exchange Rate Regimes', draft, University of Berkeley.

Hau, H. (1998), 'Competitive Entry and Endogenous Risk in the Foreign Exchange Market,' *Review of Financial Studies,* 11, pp. 757–88.

Kareken, J. H. and K. Wallace (1981) 'On the Indeterminacy of Equilibrium Exchange Rates', *Quarterly Journal of Economics*, 96, pp. 207–22.

Lettau, M. and H. Uhlig (1999), 'Rules of Thumb versus Dynamic Programming,' *American Economic Review*, 89(1), pp. 148–74.

McDermott, C. J. and R. F. Wescott (1996). 'An Empirical Analysis of Fiscal Adjustments', IMF Staff Papers; 43(4), pp. 725–53.

Perotti, R. (1999), 'Fiscal Policy in Good Times and Bad', *Quarterly Journal of Economics*, 114(4), pp.1399–1436.

Portes R. and H. Rey (1998), 'The Emergence of the Euro as an International Currency, *Economic Policy*, 26, pp. 305–32.

Sargent, T. J. (2000), *The Conquest of American Inflation*, Princeton University Press, Princeton NJ.

Sinn, H. W., and M. Reuter (2001), 'The minimum inflation rate for Euroland', NBER Working Paper No. 8085.

Summers, R. and A. Heston (1991), 'The Penn World Table Mark 5. An expanded set of international comparisons, 1950–1988', *Quarterly Journal of Economics*, 106(2), pp. 327–68.

Svensson, L. E. O. (2000), 'The First Year of the Eurosystem: Inflation Targeting or Not?' *American Economic Review*, 90(2), pp. 95–9.

Taylor, J. B. (1993), 'Discretion versus policy rules in practice', Carnegie-Rochester Conference Series on Public Policy, 39, pp. 195–214.

Taylor, J. B. (2001), 'The Role of the Exchange Rate in Monetary Policy Rules,' draft, Stanford University.

Monitoring the European Central Bank produces a full report once a year, which is complemented by an 8-page update about five months later. The update is mailed free of charge to all purchasers of the main *Monitoring the European Central Bank* report.

If you did not order your copy of *MECB 3* from CEPR directly, or your copy of the *MECB Update: Summer 2001* should be mailed to an alternative address to the report, please e-mail delivery details to subscribers@cepr.org or fax to (44 20) 7878 2999, with the message 'Please send my free copy of the *MECB Update: Summer 2001* to …'

Monitoring the European Central Bank
Subscription Form

Monitoring the European Central Bank produces a full report and a subsequent update each year. The *MECB Update* is mailed free of charge to all purchasers of the main *Monitoring the European Central Bank* report.

To ensure that you receive future issues of our *MECB* reports and updates promptly you may wish to subscribe to this series on an annual basis (this also means you can be invoiced and receive free postage and packing). Annual *MECB* subscriptions are currently available for **£30**. To subscribe, please complete the form below or contact subscribers@cepr.org .

For details on the full range of publications available from CEPR, please see www.cepr.org

1: SUBSCRIBING TO THE *MECB* SERIES

☐ **I would like to begin an annual subscription to the *MECB* series**
(payment will be due in November 2001 for 2002 subscriptions)

☐ *Please invoice me* ☐ *Please charge my Visa/Mastercard*

Credit Card No: ..... Expiry Date: .....

Cardholders' Name: .....

Signature: ..... Date: .....

2: DELIVERY DETAILS

Contact Name: .....Email Address:.....

Address: .....

.....

Telephone: .....Fax.....

3: INVOICE DETAILS *(if different)*

Contact Name: .....Order No. .....

Email Address: .....

Address: .....

.....

Telephone: .....Fax.....

As a service to our readers we occasionally make our mailing list available to other organizations whose publications may be of interest. Anyone not wanting this free service should tick this box: ☐

Please return this form to:

The Subscription Officer, CEPR, 90–98 Goswell Road, London EC1V 7RR, UK
Tel: (44 20) 7878 2900 Fax: (44 20) 7878 2999
Email: subscribers@cepr.org Website: www.cepr.org