Foreword

In November 2000 the European Central Bank (ECB) organised the first ECB Central Banking Conference. The ECB will be organising such a central banking conference every two years. They will have high-level attendance from central banks, international and European institutions, academics, as well as members of the financial press.

These conferences are designed to provide an opportunity to gather different views on specific topics of interest to central bankers. They provide a forum for debate involving academics and policy-makers. They also contribute both to enhancing insight into the ECB's policy objectives and functioning and to its openness and transparency. The ECB will publish a book after each conference, also with the aim of contributing to the economics literature through the release of original research.

The topic of the first ECB Central Banking Conference was: 'Why Price Stability?' It seemed appropriate to start this series of conferences with a topic that is at the heart of the ECB's mandate: maintaining price stability in the euro area. Looking back at this conference several months later, I believe it has been a promising start.

This book contains the papers and comments presented at the conference. It also provides summaries of the discussions of the papers and of the policy panel. I hope not only that this book will contribute to the academic debate on the issue of price stability, but also that it will serve to disseminate the views expressed during the conference to interested readers, beyond those who participated in the conference.

This conference provided another example of the fact that close contacts between the ECB and the academic world facilitate the continuous elaboration and improvement of a large set of tools that are of the utmost importance for decision-making at the ECB. At the same time, however, a central bank needs to be cautious in 'embracing' any new but untested paradigm that academics, or other observers, may provide. Here I follow Friedrich Hayek in his Nobel Memorial Lecture in 1974 and "confess that I prefer true but imperfect knowledge, even if it leaves much undetermined and unpredictable, to a pretence of exact knowledge that is likely to be false."

The second ECB Central Banking Conference will take place next year. After the experience of the first conference, it already seems somewhat like a well-established tradition. We at the ECB are already preparing for this event and trust in being able to offer an interesting conference again.

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President of the European Central Bank

Introduction

Over the last few decades there has been a remarkable convergence on the need to make price stability the main or primary objective of monetary policy. Price stability has taken centre stage because it is both an achievable medium-term goal for central banks and a pre-condition for a well-functioning market economy. In preserving price stability, monetary policy facilitates economic growth and the efficient use of resources.[1] It has long been recognised that destroying the value of money corrodes the very fabric of society and there is now a well-established consensus on the high economic and social costs of inflation and deflation. In the words of Keynes (1919), writing on the eve of a period where the destructive forces of inflation and deflation were to be unleashed to an unprecedented extent: "*There is no subtler, no surer way of overturning the existing basis of society than to debauch the currency. The process engages all forces of economic law on the side of destruction, and does it in a manner which not a man in a million is able to diagnose.*"

The ensuing history of Europe in the 20th century provides ample testimony to this point. As a result it is not surprising that the value of price stability is deeply ingrained in the mind of the European public, as emphasised in the comments made by Jean-Claude Trichet at this conference. Notably, support for the objective of price stability often seems to be more deeply rooted among the general public than among professional economists and opinion makers.[2]

The Treaty on European Union gives the European Central Bank the mandate to maintain price stability and it assigns this objective overriding importance. The choice of this mandate reflects the lessons from historical experience and also the weight of economic theory and evidence. Yet despite the widespread recognition of the need for price stability, the notion is periodically challenged and there is much less agreement – either among academic economists or central bankers – on precisely what price stability should be taken to mean. Reflecting these points the ECB organised a conference in November 2000 entitled 'Why Price Stability?', the proceedings of which are reported in this volume. It includes contributions which re-examine and restate the case for price stability as well as discussions on what price stability means and how it should be defined as an operational matter. Issues raised during the course of the conference

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[1] There is a wide body of literature on the relationship between inflation and growth. This literature almost invariably finds a negative long-run relationship between the two, or, when a non-significant relation is found, a negative long run relationship between inflation and the level of long run GDP (see Andrés and Hernando (1999)). See also the contribution to this volume by Issing for a review.

[2] A similar finding has been reported for the US by Shiller (1996). When asked whether preventing high inflation was an important national priority – as important as preventing drug abuse or preventing deterioration in the quality of schools – 84% of respondents either fully or partly agreed. Only 12% completely or partly disagreed.

include the question of how low inflation should be, the conduct of monetary policy in an environment of price stability, and the implications of specifying policy objectives in terms of either inflation or the price level.

The costs of inflation are surveyed in the pieces by Otmar Issing and José Viñals. These can be grouped in a simplified way as follows.[3] First, there are 'shoe-leather' costs incurred in the attempt to economise on the use of money – a non-interest-bearing asset – as a medium of exchange.[4] When inflation increases the opportunity cost of holding money, measured by increases in the nominal interest rate, people seek to minimise cash holdings by making more frequent trips to the bank. Such trips inevitably involve time and effort and, of course, add to the wear on one's shoes.

If this were the only aspect to be taken into consideration the optimal rate of inflation would be given by the Friedman rule (Friedman, 1969): the nominal interest rate should be driven to naught requiring a rate of deflation equal to the equilibrium real rate of interest. Economic agents would hold money balances to the point of satiation as the opportunity cost of holding money would be zero. Bailey (1956) proposed that the consumer surplus triangle under the relevant money-demand curve would be the appropriate measure to quantify this cost (see for example Lucas (2000) and Shiratsuka (2000) for recent contributions). As recalled by Issing, empirical estimates of the magnitude of shoe leather costs amount to around a quarter of one percent of output for ongoing inflation of 10% rather than zero inflation.[5]

Second, there are costs associated with the damage caused by inflation or deflation to the use of money as a unit of account. This unit of account or score keeping function of money has been emphasised by economists since, at least, the 17th century (see Le Blanc, 1690). This role may be regarded as a social convention with far-reaching implications in law, contracts, accounting and economic transactions in general. In a world characterised by nominal contracts, inflation and deflation cause arbitrary changes in the income distribution and add to uncertainty. Economic theory has not (yet) managed to adequately reflect all the implications of the fundamental role of money as a unit of account. One particular aspect of the role of money as a unit of account has been emphasised in the papers collected in the book edited by Feldstein (1999). These examine the distortions caused by inflation damaging the unit of account role of money in tax and social security systems. Because of these effects, it is estimated that there would still be substantial welfare gains associated with moving from low to zero inflation.

Marvin Goodfriend and Robert King's contribution to this conference volume builds on the general equilibrium optimal taxation literature in the spirit of Ramsey (1927) and Lucas and Stokey (1983). In so doing they contribute to the development of "the grammar about policy", to use an expression coined by Hahn (1973). Following earlier work, they use a general equilibrium model in the vein of the Real Business Cycle literature amended to incorporate imperfect competition and costly price setting. Goodfriend and King interpret the wedge between price and marginal cost – the mark-up – resulting under imperfect competition as analogous to a tax rate. They then explore

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[3] Following, for example, Fischer (1994).

[4] This argument also extends to demand deposits and other monetary instruments which provide monetary services and pay a positive, but below market, rate of interest.

[5] Chari and Kehoe (1999) have identified rigorously conditions under which the Friedman rule is optimal in the context of three different monetary economy models (a cash-credit model, a money-in-the-utility-function model and a time-to-shop model) with distorting taxes.

under which circumstances this mark-up should be uniform across time and across states of nature.

The authors show that, with staggered price setting, the aggregate price level and the inflation rate depend on the past history of prices and a distributed lead of real marginal costs (see also Galí et al. (2001)). Therefore a policy that stabilises real marginal costs also stabilises the price level. The basic intuition for the case they present for price stability may be summarised as follows. First, from their interpretation of the mark-up as a distorting tax it follows that the constancy of the mark-up corresponds to 'tax smoothing' over the business cycle or, more generally, to the case for uniform taxation in public finance. Goodfriend and King use the principles of public finance to look at the conditions under which monetary policy could depart from mark-up constancy and price stability. They argue that departures are likely to be minor and, in most relevant cases, temporary. Second, preserving price stability keeps output at potential. This corresponds to the recent emphasis in the New Keynesian literature on stabilising the output gap. In this setting there is no trade-off between price stability and stability of output around potential.

In the basic setting proposed by Goodfriend and King the optimal mark-up is the one which maximises profits when firms expect prices to be stable. If firms believe that the central bank will maintain price stability they will not have to change prices since current prices already maximise profits. By credibly maintaining price stability (i.e. by consistently fighting inflation and deflation) they suggest that a central bank will deliver optimal policy in the sense of stabilising firms' mark-ups. This class of models, which combines neo-classical with Keynesian elements can thus be used to make a case for price stability. However, it is open to debate to what extent this class of models can capture the traditional concerns of central bankers. These emphasise the role of monetary policy in providing a stable nominal anchor and stabilising nominal variables with a medium term perspective, rather than optimally smoothing and compensating for shocks and rigidities affecting the economy.

In his comments Jordi Galí welcomed the paper's thorough discussion of the theoretical underpinnings of policies that aim at stabilising prices. Nevertheless he identifies two important issues not addressed in the paper. The first regards the extent to which the optimal policy response is likely to make the zero bound constraint on interest rates binding if the implied optimal inflation rate is close to zero or even negative. The second is whether deviation from price stability under optimal policy in the presence of multiple distortions implies that prices return to their original level (or deterministic growth path) or whether there is some base drift. The issue of distortions was also pursued by the other discussant, Guido Tabellini, who argued that a high priority should be attached to examining the effects of labour market distortions and credit market imperfections. He suggested that such extensions would be likely to qualify or change the main conclusion of the paper that mark-up smoothing is optimal and that there is no trade-off between price level stability and other policy goals.

Turning to the question of what is to be understood by the term 'price stability' a, by now, classic definition has been given by Alan Greenspan. He stated that from a central banker's point of reference, an operating definition of price stability would have price stability existing "*when economic agents no longer take account of the prospective change in the general price level in their economic decision-making*" (Greenspan, 1996).

Many central banks have made this objective more concrete by providing precise (quantified) definitions in terms of a specific statistical indicator.

This is also the case for the European Central Bank. In October 1998, the ECB's Governing Council announced the ECB's stability-oriented monetary policy strategy. In this context it provided a quantitative definition of price stability as "*an annual increase in the Harmonised Index of Consumer Prices for the euro area of below 2%*." It was further clarified that this objective is to be delivered over the medium term. As discussed in the contributions to this volume by Otmar Issing and Jean-Claude Trichet, this definition reflected the heritage of the most successful national central banks in the period leading up to European Economic and Monetary Union.

Much work has also been undertaken on the costs and benefits of very low inflation. In particular, considerable research has been devoted to analysing the potential beneficial and detrimental effects of inflation in the labour market. In terms of possible benefits of positive inflation rates, it is sometimes argued that inflation helps to 'grease the wheels' of the labour market. Tobin (1972) suggested that inflation can have such an effect as it provides a way of facilitating real wage changes in the face of downward nominal rigidity. More recently Akerlof, Dickens and Perry (1996) developed a model which suggests that the loss of 'grease effects' associated with moving from low inflation (3%) to zero inflation would lead to a marked rise in equilibrium unemployment in the US.

However, inflation can also have detrimental effects on the labour market in that it adds 'sand' to wage and price adjustments. This effect may arise because general inflationary price movements are not transmitted evenly or immediately to all parts of the economy because of rigidities such as menu costs or – as discussed in the Goodfriend and King piece – because of staggered labour contracts. This may lead to unintentional and disruptive relative price changes which can distort the allocative efficiency of the price mechanism. Groshen and Schweitzer (1999) examine wage changes in large midwestern employers in the US and find evidence of both 'grease' and 'sand' effects. They conclude that inflation, even at low rates when it adds most grease to the labour market, may still be costly on balance and that fears about the detrimental effects of very low inflation on US labour markets may be exaggerated.

The contribution by Charles Wyplosz to this volume looks for evidence on the relationship between steady state unemployment and inflation in a number of European countries. According to his results, a sand effect is present at low inflation in Germany, France, the Netherlands and Switzerland. However, once inflation rises above around 2% the grease effect appears to dominate. Therefore, low inflation rates (1–2%) yield the worst of all outcomes, with zero inflation and higher inflation (Wyplosz suggests around 4%) producing superior outcomes in terms of lower steady-state unemployment. However, as Wyplosz emphasises, the results should be interpreted with considerable caution due to the difficulties in obtaining robust Phillips curve estimates, particularly for European countries. This difficulty is in part due to the scarcity of (very) low inflation observations in the sample period.

The shape of the Phillips Curves contained in the Wyplosz paper contrasts with the finding of the Groshen and Schweitzer piece which shows that the grease effects begin to taper off once inflation rises above 3–4 per cent whilst the sand effects continue to mount until inflation reaches 7–10 per cent. Consequently, the optimal rate of inflation will tend to be low. The shape of the Phillips Curve is similar to the

one estimated in Akerlof, Dickens and Perry (2000), where low inflation (of around 2%) is associated with lower unemployment than either significantly higher or lower inflation rates.

In commenting on the paper, Lars Svensson pointed to the unreliability of the Phillips curve estimates as reflected in the wide confidence intervals and raised questions about the approach taken to measure inflation expectations. The second discussant, William Dickens, emphasised the absence of controls for institutional changes in labour market institutions. He expressed particular scepticism with respect to the finding of unemployment rising with increasing inflation at very low rates of inflation. Estimates in that range were very imprecise and also reflected a general drawback of the methodological approach chosen, since inferences from the polynomial fit outside the range of the bulk of observed values would not be well grounded. In addition, it was also hard to think of any theoretical explanation for this finding.

Dickens then compared Wyplosz's "essentially atheoretical approach" with preliminary Phillips curve estimates for a number of industrial countries (Canada, the UK, France and Germany) performed on the basis of the methodology used by Akerlof, Dickens and Perry (2000). These exercises show high unemployment associated with very low inflation rates for the UK, France and Germany and – as in most of the findings by Wyplosz – unemployment declining with inflation at higher inflation rates. Dickens took the view that this common message from both models – despite their methodological differences – should raise concerns over potentially large costs of targeting an inflation rate below 2%.

However, Dickens also acknowledged that – while the results for the UK and Canada seem broadly comparable to the previous findings for the US – the results for Germany and France were more problematic. First, as inflation increases the long run unemployment rate would become negative. Second, the results taken literally would imply stronger nominal rigidity in Europe relative to the US. This finding contrasts with the evidence cited by Viñals in his contribution to the conference. In particular, Viñals and Jimeno (1998) found that the average degree of real wage rigidity in Europe is almost twice that of the US while Layard, Jackman and Nickell (1991) report that nominal inertia in wage and price setting is considerably lower in Europe than in the US. More generally, both Wyplosz and Dickens acknowledge that their specifications do not account for the role of labour market institutions and other structural factors in explaining European unemployment identified in recent work, for example, by Nickell (1997) and Blanchard and Wolfers (1999). Last, but not least, the empirical evidence presented may not be invariant to regime changes, specifically the move towards a genuine and lasting environment of price stability (Gordon, 1996).

There are thus many reasons to be wary of the resurrection of a negatively sloped Phillips curve in recent academic work a few decades after it seemed to have been laid to rest by the work of Friedman and Phelps and – perhaps more decisively – by the negative experience with attempts to exploit trade-offs between inflation and unemployment in the past. The idea of a permanent trade-off between inflation and unemployment is widely perceived to have been at the root of the excessive demand growth in the sixties and early seventies leading into the Great Inflation of the seventies. However, there is a set of different reasons for arguing that low and stable inflation rates can be regarded as compatible with price stability as recalled in the contributions by Viñals and Issing to this volume.

A first reason for aiming to achieve low measured rates of inflation is the possibility that conventional price measures may overstate inflation. If this is the case then a policy which achieves a constant measured price level may actually lead to a decline in the 'true' price level. This issue has received increased attention in recent years with the publication of a study by a US commission headed by Michael Boskin (Boskin (1996)) As discussed in the paper by Issing, there are a wide range of possible measurement biases affecting consumer price indices. These include effects arising from the substitution of goods within an index, changes in the outlets used by consumers to purchase goods and the problems caused by accounting for quality change and including new products in price indices. As indicated by the work of the Boskin Commission on US data, the effects of these statistical issues can be substantial.

A further possible argument for positive inflation rates relates to the zero bound on nominal interest rates. This is certainly not a new idea (for example, it has been emphasised by Vickrey (1954), Okun (1981), and Summers (1991)), but the Japanese experience for much of the past decade has revived interest in the problems arising when nominal short-term interest rates cannot fall below zero. If inflation and nominal interest rates are low it will become more likely that in the face of a large deflationary shock – which causes prices to fall – the reduction in real short-term interest rates needed to stabilise the economy would be constrained by the zero bound on nominal interest rates. As a consequence, the economy may be subject to greater instability as it experiences higher variability in both inflation and output and its long-term output performance may even worsen (as emphasised by Orphanides and Wieland (1998)).

However, Viñals's reading of the empirical evidence (for example in work for the US by Fuhrer and Madigan (1997), Orphanides and Wieland (1998), and Reifschneider and Williams (1999)), and the new evidence he provides in the paper, tends to suggest that the zero-bound constraint would, in practice, only rarely be encountered in the euro area. On the basis of the shocks experienced in the euro area in the past, most of the problems associated with the lower bound on nominal interest rates could be avoided for rates of inflation as low as 1%. Moreover, alternative transmission channels may be available (such as real balance effects, the exchange rate channel, asset substitution etc.) which could help alleviate the zero-bound problem.[6]

A related point also discussed in the paper by Viñals is that the zero-bound problem may become particularly severe when it occurs in circumstances where the financial system is in difficulty. As he points out, a low inflation environment does not guarantee that financial stability problems will not emerge as it will not necessarily preclude excessive risk-taking by investors, overlending by financial institutions and asset price inflation which may compromise the integrity of the balance sheets of financial intermediaries.

Both discussants, Jeff Fuhrer and Lars Heikensten, welcomed Viñals's piece as providing a comprehensive and stimulating analysis of research in this area. However, the discussants had diverging views on the importance of the lower bound for nominal interest rates. Fuhrer felt that the exercise to determine the likelihood of hitting the zero lower band may have been a bit too sanguine, citing the example of the Japanese experience

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[6] The issue of the zero bound on nominal interest rates was addressed in a number of papers in a special issue of the Journal of Money, Credit and Banking, Volume 32, Number 4, Part 2, November 2000.

from the late 1980s and the dangers of a precipitous fall in asset prices. In contrast, Heikensten felt that the issue had been accorded undue weight in the academic literature. He argued that central banks can act to stabilise inflation expectations above zero, citing the recent experience in Sweden. He also argued that the risk of deflationary spirals originating from problems in the financial sector is best addressed by institutions which aim to prevent financial imbalances from developing in the first place.

This volume is organised along the lines of the conference proceedings. It contains four sections, each of which includes a paper, some comments from discussants and a summary of the ensuing general discussion. The first considers the question 'Do we know how low inflation should be?'. It includes the paper by Charles Wyplosz and the comments made by his two discussants William Dickens and Lars Svensson. The second considers the 'case for price stability' with the contribution of Marvin Goodfriend and Robert King. The discussants for this piece were Jordi Galí and Guido Tabellini. The third examines 'Monetary policy issues in a low inflation environment' with a contribution from José Viñals that is discussed by Lars Heikensten and Jeffrey Fuhrer. The volume is completed with the proceedings from the policy panel who were asked to address the title of the conference 'Why price stability?'. Otmar Issing provides the introduction to this policy panel which also includes contributions from Laurence Ball, Paul de Grauwe, Frederic Mishkin, Lucas Papademos and Jean-Claude Trichet.

Overall, the discussions at the conference confirmed that many interesting issues remain for further research, such as how to obtain estimates of the precise costs and benefits of price stability and how price stability should best be defined. Nevertheless, there was a broad consensus on one point: that monetary policy should serve to deliver price stability.

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Julian Morgan, and Bernhard Winkler
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