Introduction

A short message, flashing on Reuters screens at 15:36 Frankfurt time on 4 January 1999, announced the launch of the first open market operation of the Eurosystem,¹ a two-week repurchase tender at a fixed interest rate of 3 per cent. This simple act symbolised the birth of the monetary policy for the new single European currency, the euro.

The introduction of the euro (technically, the start of 'Stage Three' of Economic and Monetary Union, EMU) marked at the same time the beginning of the new currency and the end of a long preparatory process. The key initial steps in this process date back to the 1950s, when the European Economic Community was created and began to take action in the field of monetary and financial co-operation. After the relatively prosperous decade of the 1960s, the time for a single European money seemed ripe: the Werner Plan (1970) proposed a first blueprint for a monetary union. But the plan failed in the climate of generalised monetary instability that dominated Europe and the world in the following years. Yet, efforts to promote monetary integration and stability in Europe continued, first in the so-called monetary 'snake', then in the European Monetary System. The process regained momentum in the 1980s, with the approval of the Single Act (1986), eventually leading to the completion of the single market and the elimination of capital controls. Free movement of goods, services and capital in the continent would eventually prove incompatible with stable exchange rates and autonomous national monetary policies, a point forcefully made by Padoa-Schioppa (1987). In 1989, the Delors Report provided a new 'plan' that, embodied in the Maastricht Treaty, eventually proved successful.

At the technical level, the preparation for the single currency, its central bank and its monetary policy is much more recent. Most of it was undertaken by the European Monetary Institute (EMI) and the participating

¹ The Eurosystem comprises the ECB and the national central banks (NCBs) of the Member States of the European Union (EU) that have adopted the euro. The European System of Central Banks (ESCB) also includes the NCBs of the other EU Member States that still retain national currencies and monetary policies.

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national central banks during EMU's Stage Two (1994–1998). In this period, the basic infrastructure for the new currency to function was created essentially from scratch, building on the experience of the participating central banks. A full set of operating instruments, basic analytical and statistical tools, a new pan-European interbank payment mechanism, internal organisational rules for the new central bank, all these and other things necessary for a new central bank to operate were set up. The technical background was very advanced when, in mid-1998, the ECB was established and the final six-month preparatory period started.

This book focuses on a fundamental and far reaching decision adopted by the Governing Council of the ECB in that period: the choice of monetary policy strategy (in short, the *ECB strategy*). Following a common terminology, by strategy we mean the framework and the procedures that the central bank uses to translate relevant information into monetary policy decisions. The strategy is a key factor shaping monetary policy making in the ECB, as it ensures that all elements relevant for monetary policy decisions are brought together in a logically consistent framework. As we will explain, the ECB strategy is also closely related to its communication policy and its operating procedures, other aspects that are discussed extensively in this book.

The broad lines of the ECB's strategy were announced by the Governing Council on 13 October 1998. The Council took the view that the strategy, aimed at ensuring price stability in accordance with the EU Treaty (henceforth 'the Treaty'), would be new and original. This originality reflects the unique characteristics of the euro area that, composed of a multiplicity of sovereign states sharing a single monetary policy, represents an unprecedented experience of monetary integration.

Nevertheless, the strategy bears marks of the influence of a number of factors. First, the process of European integration, whose general guiding principles have also inspired monetary integration. The single monetary policy has an area-wide objective (*price stability*), and is concerned with national developments only to the extent that these are significant for the area as a whole. Moreover, the influence of the principle of open and free competition can be traced in many of the features that complement the strategy, namely in the operational framework and in the architecture of payment systems. While reflecting a more general process of European integration, Monetary Union can in itself represent a catalyst for deeper integration, in goods and financial markets alike.

Second, as already emphasised, the single monetary policy culminates a long preparatory process, reflecting experiences that belong to the whole central banking profession in Europe. Among these experiences, a

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crucial one is, we believe, the 'Great Inflation' of the 1970s and the ensuing period of monetary instability. Originated from global factors – an unsustainable expansion of international liquidity; excessive government spending in the USA, partly associated with the military effort; and the first oil shock – the monetory instability was compounded in Europe by domestic factors, namely the structural characteristics of labour and product markets and the response from monetary and fiscal policies. The results were stagflation, currency instability, persistent budget deficits and high and volatile interest rates. A consensus gradually emerged from this experience, and was eventually incorporated in the Treaty and the ECB Statute, that EMU should be built around the concept of a stable money.

Finally, the ECB's monetary policy strategy has been influenced by academic work on macroeconomics and monetary policy. In fact, a key aim of this book is to describe how the ECB's strategy fits in the recent monetary economics thinking. From this viewpoint, the book can be split into three parts. The first, composed of chapters 1 and 2, provides a description of the analytical background for the ECB strategy. Although we refrain from using mathematical notation, these chapters will probably be of interest mainly to professional economists. The second part, including chapters 3 to 7 could, in our view, reach a broader audience. After an introduction to the basic features of the euro area economy, this part provides a detailed description of the main elements composing the monetary policy strategy, thus representing the core of the book. The remaining chapters are dedicated to complementary aspects. Chapter 8 describes how the strategy is implemented, chapter 9 focuses on political economy aspects and chapter 10 concludes with an overview of monetary policy decisions in the first year of the single monetary policy.

More precisely, the book is organised as follows.

In chapter 1, we address the long-standing issue of 'what monetary policy can and cannot do'. We emphasise that a large consensus, supported by theoretical and empirical studies, appears to exist on a few results concerning the long run effects of monetary policy, in particular the relationship between money and prices. However, substantial elements of uncertainty still characterise economists' knowledge of the transmission channels and effects of monetary policy in the shorter run, in spite of great advances made in the literature. According to these results, central banks are able to contribute to improve welfare if they minimise the distortions caused by inflation. They should, however, refrain from policies that crucially hinge on specific assumptions on the functioning of the economy, which could be proven incorrect.

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Chapter 2 describes the approaches suggested by the economic literature to cope with the aforementioned elements of uncertainty. In this light, we argue that a central bank's 'strategy' can be seen as a complex set of policy prescriptions. As such, it is optimal, to the best of the central bank's knowledge, but implicit, in the sense that it cannot be expressed in a simple mathematical function. By announcing its strategy, the central bank aims to convey the systematic character of policy and to characterise to the best possible extent how it will respond to the available information set. The announcement of a strategy reflects an effort towards transparency and commitment, and it signals central banks' awareness of the importance of credibility and of being able to influence markets' expectations.

Chapter 3 describes some key features of the euro area. It opens with a comparison of the new monetary area, in terms of a number of available statistics, to the Member States, the United States and Japan. Like the latter two regions, the euro area is a 'large' economy. The chapter then introduces the reader to some new statistics: the Harmonised Index of Consumer Prices (HICP) and the monetary aggregates. In a final section, some tentative evidence is presented on the functioning of the euro area economy and on its monetary policy transmission mechanism.

In chapter 4, we begin discussing the specifics of the monetary policy strategy adopted by the ECB, starting with a critical description of its first element: the announcement of a precise quantitative definition of the price stability objective. On 13 October 1998, price stability was defined as 'a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2 per cent'. This definition is analysed, first, in relation to the ECB Statute, which is part of the Treaty. We then discuss various issues related to the announced definition of price stability, such as the motivation and implications for the choice of the 2 per cent upper bound, and the geographical and temporal reference frame for price stability.

The prominent role attributed to money in the ECB strategy is discussed next, in chapter 5. We argue there that such a role is consistent with economic theory and empirical evidence. However, we also stress that a number of caveats must be borne in mind when using monetary data in day-to-day policy making. After a detailed description of the role that money plays in the ECB strategy, we present the available evidence on money demand and on the leading indicator properties of monetary aggregates for prices in the euro area.

Chapter 6 describes the second main element of the ECB strategy, the broadly based assessment of a wide range of economic and financial

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indicators. We start justifying why, in spite of the prominence of money, it is necessary for the central bank to analyse other economic indicators, and then provide an account of the main variables that compose the ECB's information set. The broadly based assessment is reached through a combination of informal judgment and the input from a number of formal econometric models.

An overview of the ECB strategy as a whole is provided in chapter 7. We discuss here the special historical circumstances, with associated difficulties, that contributed to shape the strategy. The differences from the frameworks adopted by other central banks are explained in the light of the key findings of the monetary economics literature and of the specific features of the euro area. The ECB strategy is presented as an information-processing framework, used both in internal analyses and decision making and in external communication. We conclude the chapter with a brief discussion of some of the objections that have so far been raised to the ECB strategy.

In the following two chapters, we discuss two complementary aspects of the ECB strategy. Chapter 8 concentrates on the operational framework, i.e. the set of instruments, procedures and practices that are used by the Eurosystem to intervene in the financial market, in order to achieve its objectives. The operational framework is clearly linked to, and must be consistent with, the monetary policy strategy. Moreover, it is designed to ensure an effective communication between the central bank and the market and to respect the principles of a market economy. The performance of the operational framework in the first year of the single monetary policy is also discussed in some detail, with special emphasis on the challenges faced in the 'changeover period'.

Transparency and accountability are analysed in chapter 9. We discuss first the relationship between accountability and independence, and the way in which accountability of central banks should be measured. The relationship between transparency and the publication of the internal inflation forecast, an issue that has recently attracted considerable attention in the academic literature, is considered next. We conclude with a description of the statutory requirements for the accountability of the ECB and of the ways in which it tries to achieve a high degree of transparency.

Chapter 10 concludes with a description of the practical application of the ECB strategy in the first year of EMU. We emphasise the smooth transition from the last phase of Stage Two of EMU, when national central banks retained full monetary independence in each Member State, to the beginning of Stage Three, when the responsibility for monetary

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policy in the euro area was handed over to the ECB. The monetary policy decisions of the period going from the final months of 1998 to the end of 1999 are discussed in some detail. We conclude that the stability oriented strategy proved to be a well-functioning and efficient framework for policy decisions in the newly created monetary area.

1 Money, output and prices: the scope of monetary policy

In this chapter, we draw some basic lessons from the economic literature on what monetary policy can and cannot do. This is not an attempt to find prior justifications for an over restrictive interpretation of the central banker's mandate. Understanding the limits to monetary management is essential for the central banker to avoid mistakes. To be effective and credible, monetary policy makers need to be modest, or, to put it better, realistic, in the way they see the potential scope for their action.

The literature offers a wealth of analyses, evidence and suggestions on 'what monetary policy can and cannot do', an issue which has constantly been at the core of monetary economics (see Friedman, 1968).

Unfortunately, however, the discipline is still characterised by a substantial lack of agreement on the 'appropriate model' suitable for a unified analysis of monetary policy issues. 'Whatever the particular model component that is singled out for special criticism, it seems extremely hard to avoid the conclusion that agreement ... is predominantly absent' (McCallum, 1999). Specifically, the key issue of how exactly monetary policy impacts on real variables over time is still only imperfectly understood and 'different models carry highly different alleged implications for monetary policy' (again, McCallum, 1999).

Moreover, empirical studies often cannot discriminate across competing models. Each model appears capable of replicating some stylised facts of modern economies, but it fails to portray the complex and multifaceted characteristics of the real world.

As a result, the monetary policy maker must take decisions without the help of a comprehensive and reliable body of knowledge of the interaction of monetary policy with the rest of the economy, both in the long run and at the business cycle frequency. There are, however, a few basic principles on which broad consensus can be registered both at the theoretical and empirical levels. A risk-averse central banker should place on them as much emphasis as possible.

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Accordingly, we review the literature with the aim of identifying the results of monetary theory and of the empirical analyses that, in our view, represent key and reliable benchmarks. Section 1.1 concentrates on the important lessons we have learned concerning the long run effects of monetary policy. The limits to economists' knowledge of the short run effects of policy are discussed in section 1.2. For the sake of orderly thinking, we have decided not to tackle here the normative question of what monetary policy *should* do, an issue that is touched upon in the next chapter. Rather we address the positive question of whether monetary policy *can* affect two key macroeconomic variables of interest (inflation and output) on the basis of both theoretical and empirical considerations. We conclude each section with a discussion of the policy or institutional implications of the main results of the literature surveyed.

An inherent limitation of our exposition is, clearly, that a satisfactory and agreed distinction between the long and the short run is not available, either to us or to the economic profession as a whole. We therefore follow the common practice of assigning to the 'long run' all effects of economic shocks that, other things been equal, materialise after all adjustments to the initial shock have worked through. Though the transition to equilibrium can take a long time, when the distinction is not essential, we will use the term in a looser sense, to indicate all frequencies beyond the standard business cycle. Short run effects are obviously defined as a complement.

1.1 The long run

A large consensus appears to exist in the academic literature on the direction and the dimension of the effects of monetary policy on prices and real output in the long run. It appears consensual that, in equilibrium, monetary policy is 'neutral':¹ eventually, a monetary policy shock is reflected, *ceteris paribus*, into a permanent change of the price level and no permanent changes in real variables. This proposition is often illustrated through the example of a permanent policy shock, such as a doubling of the quantity of money: when this becomes common knowledge in the economy, it will be recognised as a simple change of *numéraire*, thus leading to a one-to-one effect on the price level, but no permanent consequences on the allocation of real resources.

In the long run, there is therefore a clear dichotomy between the real and nominal variables in the economy. In this section we review the nature of the long run results focusing, in turn, on the effects of policy on prices and on output.

¹ This terminology is based on Patinkin (1965).

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1.1.1 Money and prices

The one-to-one relationship between money and prices in the long run is one of the few results that have remained undisputed over time and across economists. The robustness of this relationship derives from the fact that, as stressed by Lucas (1980), it appears to be a consistent characteristic of the long run equilibrium of virtually all models of monetary economies. Lucas goes so far as to say: 'I should think we would view any monetary model that did *not* have this neutrality property with the deepest suspicions, the way we would view a physical model that predicted different times for the earth to complete its orbit depending on whether the distance is measured in miles or kilometres' (Lucas, 1987).

This relationship is traditionally derived within the quantity equation, where it is obtained if money velocity and output are assumed to be approximately constant in the long run. It does not amount, however, to adopting the viewpoint of the monetarist doctrine. As emphasised by Lucas, 'the interpretation of the quantity theory of money as a set of predictions about the long-run average behaviour of a general equilibrium system is different, though not inconsistent with, Milton Friedman (1956). There Friedman stresses the stability of the market demand function for money, a property which is neither necessary nor sufficient for the quantity theory to obtain' in the long run (Lucas, 1980, p. 1005, fn. 1).

As a long run relationship, the quantity theory of money can be traced back to David Hume (1752a, b), who also provides its clearest statement: 'Were all the gold in England annihilated at once, and one and twenty shillings substituted in the place of every guinea, would money be more plentiful or interest lower? No surely: we would only use silver instead of gold. [...] No other difference would ever be observed, no alteration on commerce, manufacturers, navigation, or interest, unless we imagine that the colour of the metal is of any consequence' (Hume, 1752b). The main macroeconomic paradigms proposed during the last century, of both neo-Keynesian or neo-classical variety, from Hicks (1937) to Modigliani (1944), from Friedman (1956) to Patinkin (1965) and Sidrausky (1967), embody, explicitly or implicitly, the same properties, although different specifications of different models play a role in the determination of price and quantity effects.

Models incorporating features of staggered price adjustment differ only in the sense that a certain period of time must elapse before the moneyprice relationship emerges. A sign of the broad agreement on the long run quantity equation is the fact that neo-Keynesian economists are apparently ready to subscribe to it, declaring that 'when it comes to understanding inflation over the longer term, economists typically emphasise

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just one factor: growth of money supply. The reason for this emphasis is that no other factor is likely to lead to persistent increases in the price level' (Romer, 1996). The same features are present in the 'new neoclassical synthesis' model of Goodfriend and King (1997), in which short run Keynesian adjustment coexists with real business cycle properties in the long run. McCallum (1990) registers the consensus, stating that: 'there is in fact little professional disagreement with Friedman's position [that 'Inflation is always and everywhere a monetary phenomenon'] when the latter is properly interpreted. In that regard ... Friedman states that "inflation" will be taken to mean "a steady and sustained rise in prices" (1963, p. 1)'.

Theory does not predict that money is the sole economic variable that can affect prices. Other factors – from technological to aggregate demand shocks, of a transitory or permanent nature – will of course influence the rate of change of prices. Over time, however, the effects of all these 'other factors' on the price level can be offset with some degree of adjustment of the money stock. The nature of the 'other factors' is therefore irrelevant for the long run course of prices or inflation, which can be seen as entirely in the hands of the central bank. It is in this sense that inflation is ultimately a monetary phenomenon.

This theoretical consensus is corroborated by a substantial support from empirical studies. The money–price relationship appears indeed robust throughout analyses conducted across a number of dimensions: specifically, over time (Friedman and Schwartz, 1963; Lucas, 1980), across countries (e.g., Barro, 1993; Dwyer and Hafer, 1988; McCandless and Weber, 1995; Schwartz, 1973), with pooled data (Vogel, 1974), across regimes (Lothian, 1985; Rolnick and Weber, 1997) and using various definitions of money (an explicit comparison between three increasingly broad definitions can be found in McCandless and Weber, 1995). All these tests provide support to the theory.

The most straightforward results are obtained from cross-country studies. A typical cross-country diagram of the sort considered in the literature is presented in McCandless and Weber (1995, figure 1). The figure, constructed on the basis of thirty-year averages in 110 countries, shows a remarkably high and positive correlation between inflation and money growth.

Figure 1.1 presents a similar cross-country plot of long term averages (over the 1960 to 1994 period) of inflation and money growth. In order to filter out the influence of high inflation countries, graph (a) focuses on all IMF member countries with an average annual inflation rate of less than 20 per cent, while graph (b) further restricts the sample to twenty-three