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Karlheinz Ruckriegel and Franz Seitz

**The Euro System and the
Federal Reserve System
Compared: Facts and
Challenges**

Working Paper

**B 02
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The Eurosystem and the Federal Reserve System Compared: Facts and Challenges[#]

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Abstract:

This paper compares the Federal Reserve System and the Eurosystem in four aspects. These are the institutional level, the monetary policy instruments, the operational framework and the monetary policy strategy applied. It highlights the similarities and the differences as well as the efficiency of the different settings.

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The Eurosystem and the Federal Reserve System Compared: Facts and Challenges

1. Introduction

On January 1st, 1999 the monetary policy responsibility in the European Monetary Union (EMU) passed onto the Eurosystem. Since then worldwide attention has increasingly concentrated on two central banks: the Eurosystem and the Federal Reserve System (Fed). Yet, a coherent and comprehensive comparison of these two systems has been missing.¹ This is the task to be accomplished in the following.

The paper starts with the institutional settings (section 2 and 3). The following parts compare the monetary policy strategy (section 4), the monetary policy instruments (section 5) and the operational aspects (section 6). The last chapter summarizes the most important results and draws some conclusions.

2. Institutional structure and decision making²

The term "Eurosystem" is not to be found in the legal basis, i.e. the Treaties of Maastricht and Amsterdam including the protocols which are parts of the EU Treaty. The only reference here is to the European System of Central Banks (ESCB). The ESCB comprises the legally independent national EU central banks (NCBs) (currently 15) and the legally independent European Central Bank (ECB). The ECB was established on June 1st, 1998 as a common subsidiary of the national central banks located in Frankfurt/Main. The term "Eurosystem" was introduced by the decision-making bodies of the ECB at the beginning of Stage 3 of EMU (January 1st, 1999) in order to designate those parts of the European System of Central Banks which are responsible for monetary policy in the euro area (ECB, 1999a, 7). Therefore, in addition to the ECB the Eurosystem only comprises the national central banks of the countries participating in the monetary union.

The Eurosystem bears the exclusive responsibility for monetary policy in the EMU. The ECB is the "heart" of the Eurosystem. It is responsible for carrying out all tasks of the Eurosystem either through its own activity or through the national central banks. This means that the national central banks are, by function, subordinated to the ECB "to allow the Eurosystem to operate efficiently as a single entity with a view to achieving the objectives of the Treaty. (...) As integral parts of the Eurosystem, the national central banks act as operative arms of the

¹ De Nederlandsche Bank, 2001, Blenk et al., 2001, Fase/Vanthoor, 2000, and Goodfriend, 2000, are good examples which deal with specific aspects. The policy of the Fed in the last decades is analyzed by Ireland, 2000, and Cooper/Little, 2000. An overview of monetary policy procedures of different central banks before EMU may be found in Bernanke/Mishkin, 1992.

² For the institutional aspects of the Eurosystem in detail see Görgens et al., 2002, chapter II.1.

ESCB, carrying out the tasks conferred upon the Eurosystem in accordance with the rules established by the ECB." (ECB, 1999c, 57, 61).

Therefore, the basic principle of the Eurosystem is "centralized decision-making, decentralized operations". The principle of decentralization stipulates that, to the extent deemed possible and appropriate, the carrying out of the monetary policy operations is the task of the NCBs. However, decentralization applies to operations only. The monetary policy decisions and legislative activities remain centralized as necessary for a common monetary policy. Unlike the ECB and the NCBs, the Eurosystem and the ESCB have neither legal personality nor competence to pass decisions on their own. Both are governed by the decision-making bodies of the ECB (the Governing Council, the General Council and the Executive Board).

The Governing Council of the ECB is the central decision-making body of the Eurosystem. It consists of the president and the vice-president of the ECB, the (four) further members of the Executive Board and the governors of the euro area NCBs. The term of office of the president of the ECB is eight years.³ In general, this is also true for the remaining members of the Board. In order to prevent all Board members from leaving at the same time, their terms of office were staggered in the case of their first appointment. The terms of the Board members are not renewable. The terms of office of the presidents of the NCBs as well as those of the remaining members of the decision-making bodies of the NCBs must last at least five years. The presidents of the NCBs are appointed according to the national laws. In Germany, for example, the appointment is made through the Federal President at the suggestion of the Federal Government. The members of the Executive Board of the ECB are appointed by agreement by the heads of government of the participating member states.

Decisions of the ECB Governing Council require a simple majority of the members present in person with each member having one vote. In case of a tie, the president of the ECB has the casting vote. Yet, for any decisions to be taken on the ECB capital, the contributions of the national central banks to the foreign exchange reserves as well as questions regarding the distribution of seigniorage the votes are weighted according to the national central banks' shares in the subscribed capital of the ECB.⁴ Members of the Board have no vote in these instances.

³ Thus, a letter of intent of an early retirement which happened in the case of the first appointment is not in accordance with the Statute of the ECB.

⁴ The contribution of each national central bank to the capital of the ECB is allocated according to the share of the member state in EU population and in EU GDP at market prices.

Currently, every governor of the NCBs has one seat and one vote in the Governing Council. Against the background of EU enlargement and the prospective membership of these countries in EMU this seems not to be feasible in the long run.⁵ The composition of the Federal Open Market Committee (FOMC), the main decision-making body of the Federal Reserve System (Fed) may be directive in this context. The FOMC consists of seven members of the Board of Governors (comparable to the Executive Board of the ECB) and the president of the Federal Reserve Bank of New York as permanent members. Of the remaining eleven presidents of the Federal Reserve Banks (FRBs) only four have the right to vote on the basis of an annual rotation. However, all presidents of the FRBs participate in the FOMC meetings taking place every six weeks.⁶ In particular, they inform the FOMC about the economic situation in their districts. These regional analyses are published after the meetings (the so-called "Beige Book").⁷

The Federal Reserve System was set up in 1913. It is comprised of the Board of Governors and the twelve regional Federal Reserve Banks. Until 1935 the decisive role was played by the FRBs. The most important monetary policy instrument at that time, the discount rate, was decided upon independently by each FRB. In the 1920s the instrument of open market operations was "discovered" (Humphrey, 2001, 84-86; Wheelock, 2000, 249-251). It was, however, used with varying intensity by the individual FRBs. The FOMC was founded in 1933. At that time, it could only give recommendations whereas the individual FRBs had the right to decide. In order to have a common monetary policy which is directed to the whole economy, a basic reform of the Fed came up in 1935. Open market policy was now placed into the responsibility of the FOMC and the influence of the FRBs in the FOMC was reduced. Consequently, since then the members of the Board of Governors have had a majority in the FOMC (Meade/Sheets, 1999, 55f., Friedman/Schwarz, 1963, 445-449).

The President of the United States appoints the members of the Board of Governors. This appointment has to be confirmed by the US senate. The contract terms are 14 years; a

⁵ Hefeker, 2001, discusses theoretically the optimal institutional structure of an independent supranational central bank in a monetary union.

⁶ The Governing Council of the ECB on the other hand meets every 2 weeks. In extraordinary cases, the Council can meet at short notice, i.e. also between the official meetings, to decide with the aid of phone and/or video conferences. The FOMC has delegated to the Chairman the right to change interest rates between meetings without consulting the Committee. But, except in very highly unusual circumstances the Chairman is likely to consult the Committee by conference call before he makes an inter-meeting move. Therefore, in practice, the procedure in the FOMC corresponds to that of the Governing Council of the ECB.

⁷ The decentralized structure of the FOMC and the ECB Governing Council should enhance the transparency of the central bank, Green, 2001.

reappointment is not possible.⁸ The governors should originate from different Federal Reserve districts (regional areas of responsibility of the individual FRBs) so that individual areas are not over-represented. The chairman of the Board of Governors is appointed by the President of the United States out of the seven Board members. He has an office term of 4 years. Each of the 12 FRBs is responsible for a specific district. These districts are not necessarily identical with state boundaries. The location assignment of the FRBs in the individual districts was decided according to the political and economic importance of the individual cities. Initially, the GDP of the 12 districts had approximately the same magnitude. However, the individual districts have developed differently since the foundation of the Fed.

The presidents of the FRBs are appointed by the directors of the FRBs. However, approval by the Board of Governors is necessary. On the other hand, the appointment of the presidents of the NCBs in the Eurosystem is the sole responsibility of the respective country, i.e. an approval by the Executive Board of the ECB is not needed. Each FRB has nine directors. Six of them are elected by member banks which are formally owners of the FRBs, three are appointed by the Board of Governors. The six directors elected by the member banks are composed of three from the banking system and three from non-banks. The FRBs are responsible for the monetary policy operations of the Fed; they analyze the regional developments and explain the course of monetary policy in their district. The presidents and the research departments of the FRBs add valuable information to the monetary policy decision process (Minehan, 2000, 174).

As mentioned above, the individual FRB districts of the Fed had nearly the same economic importance at the time of its foundation in 1913. This is not the case for the Eurosystem within which big differences in the economic importance of the individual member states have existed right from the beginning of EMU. Currently, these differences are by far greater than those between the individual Fed districts (see Table 1).

Table 1: Distribution of Fed districts and EMU member states in terms of GDP

Percentage of nominal GDP (1999)	Fed districts	EMU countries
0 - 5	1	7
5-10	10	2
10-15	-	-
15-20	1	1
20-30	-	1

⁸ „After serving a full term, a Board member may not be reappointed. If a member leaves the Board before his or her term expires, however, the person appointed and confirmed to serve the remainder of the term may later be reappointed to a full term.“ Board of Governors, 1994, 4.

> 30	-	1
Total number	12	12
Total GDP (in bn €)	10.015	6.168

Source: Fase/Vanhoor, 2000, 66f.

For a successful monetary policy, this is unproblematic provided the monetary policy decisions are based on the euro area as a whole, i.e. on weighted averages. Since an enlargement of the member states of the monetary union requires a change in the voting procedures in the Governing Council of the ECB, it would be consistent in the sense of a "denationalization of monetary policy" to reshape the voting procedures in such a way that the voices of the Executive Board predominate.⁹ In this way an institutional orientation of monetary policy towards the entire euro area may be facilitated.¹⁰ What has to be decided is the role of the presidents of the NCBs in the voting process. A rotation principle according to the model of the FOMC or a weighting of the votes of the ECB Council members would be possible. The question also arises whether some countries should have a permanent representative in the Council or whether country groups should be formed which have only one vote for the group as a whole (analogous to the reform of the state central bank (Landeszentralbanken) districts in the Bundesbank system after reunification). However, changing the voting procedure in favour of the Executive Board does not mean that the Eurosystem frees itself from its regional anchoring.

In accordance with article 29 of the statutes of the ESCB and the ECB, each national central bank contributes to the ECB's capital (at present €5 bn.) according to a weighting scheme. This scheme is based on the share of the member state in EU population and the share of the member state in nominal EU GDP (each 50 %). The weightings assigned shall be adjusted every five years or if new EU members make a revision necessary. The Governing Council of the ECB is authorized to increase the capital by up to a further €5 bn..

On the basis of all 15 EU member states a capital share of 24.5 % was allotted to the Deutsche Bundesbank. However, since only 12 countries currently participate in EMU and therefore in the Eurosystem, and since only these countries paid in full their corresponding capital share, the German share is higher (about 30 %, see Table 2).

⁹ "Europe may do well to heed the Fed's history. Much more decentralized in structure and in operational responsibilities than the Fed, the ESCB must avoid any tendency to promote the national economic situation or national financial market at the expense of the area as a whole." Meade/Sheets, 1999, 66. See for further reform proposals Fritz, 2001.

¹⁰ At the Nice summit (December 2000) it was agreed upon to include an authorization stipulation for a simplified change of the voting procedures in the ECB Council. The decision to change the voting procedures has to be taken by unanimity by the EU Council in the composition of the heads of government on recommendation of the ECB and/or the EU Commission. It must be ratified by the member states in accordance with their national legislation (Deutsche Bundesbank, 2001, 18).

Table 2: Shares of EMU central banks in (fully paid) ECB capital

Owner	Percent
Deutsche Bundesbank	30.2
Banque de France	20.8
Banca d'Italia	18.4
Banco de España	11.0
De Nederlandsche Bank	5.3
Banque National de Belgique	3.5
Austrian Central Bank	2.9
Bank of Greece	2.5
Banco de Portugal	2.4
Suomen Pankki	1.7
Central Bank of Ireland	1.0
Banque Centrale du Luxembourg	0.2

Source: ECB, 1999b, 122; own calculations.

Notes: The 12 national central banks of the Eurosystem hold a total of 81 % of ECB capital of €5 bn.; the central banks of Denmark, Sweden and the United Kingdom have signed the remaining 19 % or the equivalent of €950 mn. of which only 5 % were paid in.

Inter alia, the capital share is important because it determines the allocation of monetary income (net of interest payments on banks' reserves) and of the profit of the ECB to the national central banks (see article 32.5 and 33.1 of the statutes of the ESCB and the ECB). The monetary income of the Eurosystem (the so-called seigniorage) is equal to the income derived from its assets held against notes in circulation and deposit liabilities to credit institutions.

In principle, the Governing Council of the ECB guarantees the required uniformity of monetary policy. The implementation of monetary policy is due to the ECB in cooperation with the NCBs. In this way the experiences of the latter can be used. The execution of monetary policy is in the hands of the Executive Board of the ECB in accordance with the directives and decisions of the Governing Council of the ECB which gives the necessary instructions to the NCBs.

As long as there are EU member states which have not joined EMU, there is one further body, the so-called General Council, composed of the president and the vice-president of the ECB as well as the governors of all NCBs of the EU. It acts as an advising committee but has no monetary policy competences. The General Council is intended to enhance monetary policy coordination. Furthermore, it has the task to monitor the proper functioning of the new exchange rate mechanism EMS II which links the euro and the currencies of the non-EMU EU countries on a voluntary basis. Currently, only Denmark participates in this arrangement.

3. Main task(s) and status

The primary objective of the Eurosystem is to maintain price stability. Making this statement operable is due to the Eurosystem (see section 4). The EU Treaty does not specify a precise, quantitative definition of price stability or a time frame within which this objective should be attained. Without prejudice to the primary goal of price stability, the Eurosystem should support the general economic policy in the EU. Insofar as the general objective is not to the discretion of the Eurosystem, it is goal dependent. On the contrary, the Fed shall pursue several goals. The Federal Reserve Act states the following: "The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the country's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices and moderate long-term interest rates."¹¹ Despite this multitude of final objectives the monetary policy reaction function of the Fed seems to reveal a kind of implicit inflation targeting (Clarida et al., 1998). On the other hand, the reaction function of the ECB seems to feature a high weight on the output gap relative to the weight on inflation, compared to the former Bundesbank benchmark (Faust et al., 2001).

To effectively pursue its goal the Eurosystem is independent from political influence on the national and EU level.¹² To quote the Federal Constitutional Court of Germany in a verdict from 1993: "The delegation of most tasks of monetary policy to an independent central bank extracts sovereignty power from direct government or supranational parliamentary responsibility, in order to remove matters related to the currency beyond the influence of interest groups and the re-election focused politicians."¹³ Therefore, the Eurosystem owns full "instrument independence".¹⁴ The Eurosystem only has to take into account to act in accordance with the principle of an open market economy with free competition (see article 105 of the EU Treaty). Consequently, certain instruments, for instance quantitative credit rationings cannot be introduced (Schwarze, 2000, 1294).

Table 3: Overview of selected institutional aspects

	Eurosystem	Federal Reserve System
(Legal) objective	Maintaining price stability as	"Maximum employment,

¹¹ "Abjuring any responsibilities for real outcome would not be legal even if it were somehow thought desirable.", Friedman, 2000, 57.

¹² See for an analysis of several aspects of the independence of the Eurosystem Geigant, 2000, Randzio-Plath/Padoa-Schioppa, 2000, Reumann, 2001, Schwarze, 2000 and Seidel, 2001. For a discussion of historical evidence on central bank independence see Wood, 2001a.

¹³ The same line of argumentation can be found in the draft of the first version of the Bundesbank Act formulated by the Federal Government (Bundesregierung), Deutscher Bundestag, 1956, 24-26.

¹⁴ See Mishkin, 2000, 5, for a distinction between "goal independence" and "instrument independence".

	primary objective. ^{a)}	stable prices, and moderate long-term interest rates. ^{c)}
Definition of objective	"Price stability shall be defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2 %. Price stability is to be maintained over the medium term." ^{b)}	No definition in operation. ^{d)}
Decision-making powers	(Interest) decisions of the Eurosystem cannot be revised.	Only Congress can revise (interest) decisions of the FOMC by law. In that sense they are more or less irrefutable. ^{e)}
Legal basis	International law which can only be changed with unanimity by all EU member states.	(Simple) law which can be changed by Congress.

Annotation:

a) Article 105 (1) of EU Treaty.

b) ECB press release dated October 13th, 1998 (<http://www.ecb.int>). This target is based on a weighted average of the national HICPs.

c) Board of Governors, 1994, 17.

d) "At the present time, the public (and maybe even members of the FOMC) have no idea of whether the Fed's goal for inflation is 1 percent, 2 percent, or possibly higher. I think it is fair to say that right now the nominal anchor in the United States is Alan Greenspan. The problem is that this leaves some ambiguity as to what the Fed's target is." Mishkin, 2000, 9.

e) Blinder, 1999, 55.

Compared to other central banks, the Eurosystem has the highest degree of independence (Bini Smaghi/Gros, 2000, 125-129, Mishkin, 2001, 383, Schich/Seitz, 2000, Wood, 2001b, 79, Wynne, 1999, 6.) The possible threat of a revision of its (interest) decisions (e.g. through the European Parliament, the EU Commission or the Ecofin Council) is not on the agenda. The EU Treaty and the Statutes of the ESCB are the legal basis. Since this is international law, it can only be modified with unanimity by all EU member states. In this respect, the position of the Fed is by far weaker. "The Federal Reserve System is considered to be an independent central bank. It is so, however, only in the sense that its decisions do not have to be ratified by the President or anyone else in the executive branch of government. The entire System is subject to oversight by the US Congress because the Constitution gives to Congress the power to coin money and set its value – a power that, in the 1913 act, Congress itself delegated to the Federal Reserve. The Federal Reserve must work within the framework of the overall objectives of economic and financial policy established by the government, and thus the description of the System as “independent within the government“ is more accurate." (Board of Governors, 1994, 3). Consequently, unlike for the Eurosystem the danger exists for

the Fed that Congress could change the legal basis.¹⁵ Thus, "the ESCB has a more secure institutional foundation than the Fed, which is a creation of Congress and whose structure can be changed at any time. Hopefully members of the ESCB MPC (Monetary Policy Committee) will not come to believe that the survival of the ESCB depends upon the political skills of its president". (Hetzel, 2000, 276). The fact that the independence of the Fed has only a weak legal basis combined with the multitude of objectives may create problems for an effective and credible monetary policy of the Fed.¹⁶

Table 3 summarizes selected institutional aspects of the comparison Eurosystem - Federal Reserve System.

4. The monetary policy strategy

The monetary policy strategy forms the conceptual framework for the current monetary policy. The incomplete and uncertain knowledge of the precise monetary transmission process suggests the use of a monetary policy strategy.¹⁷ With a coherent and credible concept communicated to the general public and the markets, an increasing steadiness of monetary policy should be achieved. Furthermore, such a strategy can act as a communication device with the public insofar as it enhances the forecastability of monetary policy actions and reduces monetary policy uncertainty. Taken together this also contributes to increased transparency of monetary policy.

The monetary policy strategy of the Eurosystem was announced at the meetings of the ECB Governing Council in October and December 1998.¹⁸ It is comprised of three main elements,

¹⁵ "Moreover, bearing in mind that Congress may alter the legislation at all times, the Fed will make sure that its monetary policy does not deviate too much from the Congress members' views." De Nederlandsche Bank, 2001, 57. "Congress thus retains the authority to oversee and instruct the Federal Reserve as it sees fit." McDonough, 1994, 6. But the position of the Fed concerning their relation with the US-Federal Government isn't totally clear, too. Hetzel/Leach, 2001a, 33, argue that it was only the Treasury-Fed Accord, announced March 4, 1951 (for the Accord in detail see Federal Reserve Bulletin, 1951, 267) which freed the Fed from the obligation to peg government security prices and laid the foundation for an independent monetary policy. So the question is, what happens if the Treasury cancels this arrangement? The importance of the central bank constitution for an effective monetary policy is highlighted by Bofinger, 2001, 205-239, von Hagen/Hayo/Fender, 2001, 11-15; Illing, 2000, and Walsh, 1998, 375- 381.

¹⁶ "...by the mid-1920s there were voices – some within, but most without, the Federal Reserve System – claiming that the Fed should have learned that stabilization rather than accommodation was its overriding task... Accordingly, these same voices advocated that the original Federal Reserve Act be amended to make price stability the chief responsibility of the System." (Humphrey, 2001, 66). "Federal Reserve presidents were the first...to advocate establishing price level stability as the primary goal of System policy." (Wheelock, 2000, 261).

¹⁷ An overview of the monetary policy transmission process in the euro area compared to that in then US is given by Angeloni et al., 2002.

¹⁸ A detailed prescription of the monetary policy strategy of the Eurosystem from the point of view of the ECB may be found in Issing et al., 2001.

a quantitative definition of price stability ("the anchor"), a reference value for M3 ("the first pillar") and a broadly based assessment of price developments ("the second pillar").

The Eurosystem defines price stability as a year-on-year increase in the Harmonized Index of Consumer Prices (HICP) for the euro area of less than 2 %. Price stability should be achieved or contained over the medium term. Consequently, temporary missings of the range of 0 % to 2 % (e.g. on account of an oil price shock) are in line with this definition. The Eurosystem does not try to achieve a measured inflation rate of zero. Rather, price increases of up to 2 % are compatible with price stability. Measurement errors in the calculation of price indices imply not to strive for an inflation rate of zero (see e.g. Boskin et al., 1996, and Hoffmann, 1998). If, however, the measurement error does not account for 2 % the remainder has to be justified with deflation risks and the costs of too low inflation rates (e.g. the non-fulfilment of other goals). The concrete formulation of the definition by the Eurosystems has three important implications: First, essential for the Eurosystem are price developments in the entire euro area, not in individual countries. Second, prices are measured on the consumer level and not with other price variables (e.g. producer prices or the GDP deflator). And third, both an inflation (price increases over 2 %) and a deflation (negative growth rates of the HICP) are incompatible with price stability.

After the final target has been made empirically operable with the help of the "anchor", the next step is to find efficient ways to achieve and maintain price stability.

A monetary policy strategy should be medium-term oriented. Over this time horizon inflation is mainly a monetary phenomenon. The Eurosystem tried to incorporate this theoretical and empirical finding into its strategy by assigning money a special role. Specifically, it publishes a reference value for the broad monetary aggregate M3 which closely resembles the money supply strategy of the Deutsche Bundesbank.¹⁹ However, due to the uncertainties connected with the regime change to a common monetary policy, the reference value should not be interpreted as an intermediate target but should have a smaller binding function. Moreover, the reference value is not specified as a target range but as a point value. It is a timeless value and is reviewed on an annual basis. The components underlying the derivation of the reference value are trend real GDP growth, the definition of price stability and an assumption on the trend of velocity of circulation of M3. The Eurosystem publishes both the reference

¹⁹ M3 includes of currency in circulation, overnight deposits, deposits with an agreed maturity of up to two years, deposits redeemable at a period of notice of up to three months, repurchase agreements, money market fund shares/units and money market paper as well as debt securities with a maturity of up to two years. Meyer, 2001a, 23ff. discusses the application of the reference value concept to the US case.

value and the underlying determinants.²⁰ This should enhance monetary policy transparency. Following the medium-term orientation, the reference value is to be interpreted as an annual average. The ECB compares current monetary developments with this reference value. However, it does not simply calculate annual money growth rates, but smoothes them with a three-month moving average of the annual growth rates.

The relationship to the directly controllable operational variable, the overnight money market rate, and to price developments (see Nicoletti-Altimari, 2001) were decisive for the decision in favour of the broad aggregate M3. Moreover, EMU money demand for broad monetary aggregates seems to be stable (see for an overview Görgens et al., 2002, Table II.2.5).

Due to uncertainties in connection with money demand the strategy of the Eurosystem is supplemented by a second pillar. This pillar consists of a broadly based assessment of price developments by means of a wide range of indicators of inflationary pressures in addition to money. In the long run inflation is surely a monetary phenomenon. However, in the short run, this relationship is concealed by several other factors. Such short-term developments are relevant for monetary policy since their effects may become entrenched. In order to assess price developments adequately, the ECB first looks at the prices on different stages of the price formation process (producer prices, intermediate goods prices, prices of investment goods and different consumer goods prices). The other short term indicators can be grouped into indicators of economic activity (e.g. output gaps, raw material prices and the exchange rate), financial market indicators (e.g. the term structure, nominal and indexed yields of bonds, share price indices and option prices) and surveys on consumers' and firms' price expectations.

Within this second pillar, the ECB has published (conditional) forecasts on the change in the HICP and GDP growth (including the most important determinants private consumption, government consumption, gross investment, exports and imports) since December 2000. They are called macroeconomic projections. The projections are based on the assumption of unchanged short-term interest rates and exchange rates. In particular, this means that the projections are conditional on an unchanged monetary policy stance. The forecasts are made by staff members of the ECB and of the national central banks of the countries participating in EMU. They do not embody the opinion of the Governing Council of the ECB and are published on a regular basis twice a year (in spring and fall) for a two-year period.

²⁰ For the first 4 years, the reference value was set at 4½ % in each case. Its calculation is based on a trend growth in the euro area between 2 % and 2.5 %, price increases not exceeding 2 % and a trend decline in the velocity of circulation of 0.5 % to 1 % p.a.. This value is consistent with the results of money demand estimates for M3 (see e.g. Brand/Cassola, 2000).

The two pillars of the strategy of the Eurosystem are called the two-pillar concept. On the one hand, this term refers to the specifics of the Eurosystem. On the other hand, it is also a delimitation to a policy with intermediate monetary targets (see e.g. von Hagen, 1999) or to inflation targeting (see e.g. Bernanke et al., 1999). With this approach the Eurosystem tries to combine the experiences of the participating NCB's with the particular new situation in the EMU. This surely makes sense for the first years of the common monetary policy. However, what is missing is a concrete nominal guideline to firmly anchor inflationary expectations. The publication of a definition of price stability, as intended by the ECB (ECB, 2001a, 38), is not sufficient in this respect if the two (equally weighted) pillars deliver inconsistent information. Therefore, over the years, a more concrete framework is desirable. Since a strategy should be oriented towards the medium term and as inflation is a monetary phenomenon over this time horizon, more emphasis should be put on the money pillar. If no dangers to price stability exist even though monetary developments are not on track, the Eurosystem has to communicate this thoroughly to the markets.²¹

Instabilities in money demand relations forced the Fed to abandon monetary targets at the beginning of the nineties and to look for a new strategy. The causes for this development were financial innovations, disintermediation and - related to that - behavioral changes of private market participants. The Fed decided not to switch to a strategy of direct inflation targeting. The most important reason for the FOMC mentioned in 1995 was that "close adherence to inflation targets could unduly constrain the Federal Reserve in its efforts to counteract the effects of cyclical shortfalls in the performance of the economy" (see also Meyer, 2001b). This judgment has to be evaluated against the background that the Federal Reserve System has to follow several goals.

Since that time the policy of the Fed may be characterized as a multi indicator approach without an explicit intermediate target. Within this approach real variables play a decisive role. Just to quote Alan Greenspan (1993, 2): "With considerable uncertainty persisting about the relationship of the monetary aggregates to spending, the behavior of the aggregates relative to their annual ranges will likely be of limited use in guiding policy (...), and the Federal Reserve will continue to utilize a broad range of financial and economic indicators in assessing its policy stance." Attention is above all paid to real interest rates and to the (real) term structure (Greenspan, 1993). However, up to now no variable has become an official

²¹ A good example in this respect is the ECB's assessment and communication of the high growth rates of M3 in the second half of 2001, see ECB, 2001b, Box 1. A discussion of the longer-term perspective against the background of instabilities in money demand behavior and the evolution of financial markets may be found in Görgens et al., 2002, ch. II.2.6.6.

intermediate target. These two variables are incorporated into a multi indicator system for forecasting price developments and the business cycle (“looking at everything”). Bernanke et al. (1999) call this approach a “just do it strategy”. The Fed predicts inflationary pressures mainly in the case of rising GDP growth which manifests itself in an increasing capacity utilization.

Due to the reputation and credibility of Alan Greenspan the Fed succeeded with this approach. As a result, the difficulties inherent in this concept during a monetary policy change did manifest themselves only discreetly. With the - in the case of the US - relatively low inflation rates the Fed also had room to pursue its further objectives. However, such a concept also embodies definite disadvantages. What is missing is an explicit nominal anchor (Scheide, 2001, 335). In this way, the expectations of the public and the internal decision process of the Fed lack a clear orientation. Moreover, the implicit feedback rule is ambiguous as the Fed in addition to price stability equally pursues several other objectives. All this is combined with a certain element of intransparency. The market participants are constantly forced to make guesses on what the economic variables are which really count for the Fed.

One can even argue that, except for Alan Greenspan, there is no focal point for Fed policy. Consequently, at the current date this "strategy" can be no model for the Eurosystem (Svensson, 2001).

5. Monetary policy instruments

The note issuing privilege of the central bank (P.1 in Chart 1) and the minimum reserves as well as deposits on accounts with the central bank for settlement purposes (“working balances”)²² lead to a (mandatory) demand for central bank money on the part of the credit institutions. However, central bank money can only be created if the credit institutions transact with the central bank. There are essentially three possibilities here: Either the central bank is ready to buy foreign assets (A.1 in Chart 1) or the credit institutions borrow money from the central bank (A.2a in Chart 1) or the central bank buys securities (government bonds) from the credit institutions (A.2b in Chart 1). However, neither the Eurosystem nor the Fed actively purchase foreign assets with the aim of injecting liquidity into the economy. In particular, in case of the Eurosystem the foreign assets essentially stem from US-\$ purchases during the times of the fixed exchange rate regime of Bretton-Woods.

²² "Although the banks' reason for holding companies reserves is different, as long as the need for settlement balances is related to bank's volume of deposits the implication of central bank operations is the same", Friedman, 2000, 46. See also Blenck et al., 2001, 24-27 and Borio 2001, 3-7.

Chart 1: A stylized central bank balance sheet

Assets	Liabilities
A.1: Foreign assets	P.1: Banknotes in circulation
A.2a: Loans to credit institutions	P.2: Liabilities against credit institutions
A.2b: Securities	
A.3: Other factors	P.3: Other factors

The monetary policy instruments impact either the asset side or the liability side of the central bank balance sheet. The Eurosystem has three types of instruments at its disposal: minimum reserves, open market operation and the so called “standing facilities”. In the US, there are minimum reserves, open market operations and the so called “discount window”. In the Eurosystem all essential decisions about the use of the instruments are made by the Governing Council of the ECB. In the Federal Reserve System the FOMC is only responsible for the open market operations. Decisions about the use of minimum reserves and the discount window are made by the Board of Governors.

Chart 2: Federal Reserve’s balance sheet (30 December 2000, bn US dollar)

Assets		Liabilities	
A.1: Foreign assets (including gold)	26.4	P.1: Banknotes in circulation	563.5
A.2a: Loans to credit institutions (Discount Window)	0.1	P.2: Liabilities (against credit institutions)	19.0
A.2b: Securities	555.2		
A.3: Other factors	31.8	P.3: Other factors	31.0

Source: Blenck et. al., 2001, annex 2.

Chart 3: Eurosystem’s balance sheet (31 December 2000, bn US dollar, exchange rate 0,9388 US-\$ per €)

Assets		Liabilities	
A.1: Foreign assets (including gold)	348.8	P.1: Banknotes in circulation	348.6
A.2a: Loans to credit institutions	252.2	P.2: Liabilities (against credit institutions)	116.7
A.2b: Securities	78.5		
A.3: Other factors	85.8	P.3: Other factors	300.0

Source: Blenck et. al., 2001, annex 2.

A comparison of the balance sheets of both central banks (see Charts 2 and 3) reveals that the Fed provides liquidity via traditional open market operations (mainly outright purchases of securities) whereas the Eurosystem does this mainly via loans to credit institutions. The purchase of securities is not actively used by the Eurosystem. These assets (A.2b in Chart 1) stem from the time before the Eurosystem was established. Consequently, this position will decrease over time. The huge amount of foreign assets arises mainly from the purchase of US dollars during the time of Bretton-Woods.

The design of required reserves is similar in both systems (for the institutional frameworks in detail see Blenck et. al., 2001, annex 1). Credit institutions are required to hold “minimum reserves” at their central banks either as deposits on accounts with the central bank (P.2 in Chart 2 and 3, respectively) or as vault cash. The Eurosystem only allows the first alternative, whereas credit institutions in the USA can also fulfil their obligations with vault cash. Credit institutions are obliged to hold required reserves in relation to specific liabilities of their balance sheets. They have to fulfil their reserve requirements on an average basis of the daily balances including vault cash (in the case of the Fed) over a reserve maintenance period (the Eurosystem has a one-month, the Fed a two-week maintenance period). In the US, credit institutions have to maintain minimum reserves only for transaction deposits and the reserve ratio is normally set at 10 %. In the Eurosystem the credit institutions have to hold minimum reserves for a broader range of liabilities (overnight deposits, deposits with a maturity of up to two years, debt securities with a maturity of up to two years, and money market paper). Here the reserve ratio is set at 2 %. However, the main difference between both systems is that the Eurosystem pays interest for the deposits and the Fed does not.

Table 1: Average reserve levels for maintenance periods 2000		
	Eurosystem (in bn €)	Fed (in bn \$)
Reserve requirements	112	40
Applied vault cash	-	36
Required reserve balances	112	4
Required clearing balances	-	6
Total required balances	112	10
Excess reserves	0.7	1

Source: Blenck, 2001, Annex 1; own additions.

This is the reason why credit institutions in the US try to avoid holding deposits on accounts with the Fed (required reserve balances in Table 1). For this purpose they use so-called “retail sweep programs”. Retail sweep programs are software programs which automatically transfer funds from transaction accounts to saving accounts without bank customers taking notice of this transfer (for details see Anderson/Rasche, 2000, 2001). For them nothing has changed.

The only reason for this activity is to reduce credit institutions' non-remunerated reserve requirements. Using this method, the credit institutions more or less determine the required reserves on their own.^{23,24} As a consequence, the necessity to hold deposits on accounts with the Fed to fulfil the reserve requirements are lower for most credit institutions than the funds they need to handle the payments via their accounts at the Fed ("working balances"). In such cases, however, there is little room for a falling below, and little stimulus for exceeding the minimum balances needed for payments. Therefore the stabilization function of minimum reserves for money market interest rates is negatively affected (Borio, 2001, 16, Orphanides, 2001, 49f; the functions of required reserves from a monetary policy perspective are discussed in Board of Governors, 1994, 56f, Sellon/Weiner, 1996, 7, Meyer, 1998, 328, ECB, 2001, 71f, Görgens et al., 2002, ch. II.3 and 4).

Consequently, the Fed demands a payment of interest on required reserve balances from Congress in order to reduce and/or eliminate any incentives to avoid maintaining deposits on accounts with the Fed (Meyer, 2000, 454).²⁵ If it succeeds, the Fed may also restrict the allowance of vault cash. Moreover, the Fed strives for a permission for paying interest on excess reserves (Meyer, 2000, 456). If the Fed is allowed to do this, excess reserves will have the same function as the marginal lending facility in the Eurosystem.

The Eurosystem also carries out open market operations. These operations are undertaken on the initiative of the Eurosystem. Traditionally the term "open market operations" was used for the purchase and sale of securities (government bonds). The Eurosystem, however, uses this term in an enumerative way. The most important open market operations of the Eurosystem are the so-called "main refinancing operations" and the "longer-term refinancing operations". The former are loans of a two-week term which are offered every week; the latter are loans

²³ The Fed approved such a booking practice to avoid required reserves for the first time in January 1994 (Anderson/Rasche, 2001, 51). In the euro area, measures which are used solely for the avoidance of minimum reserves are not allowed. But through paying interests on deposits with the NCBs, no incentives exist for credit institutions to avoid the minimum reserves because in principle the interest rate they get for their required reserves account is the same as that for loans they get from the NCBs.

²⁴ "These sweeps have allowed required reserve balances to decline sharply from about \$ 30 billion in 1990, to \$ 15 billion in 1996 and to only about \$ 5 to \$ 6 billion today." Taylor, 2001, 33.

²⁵ "While the Federal reserve has long supported the payment of interest on reserves, it does not currently have the legal authority to do so. Over the years, the main obstacle to payment of interests on reserve balances has been the budgetary impact of the potential loss of Treasury revenue." Sellon/Weiner, 1997, 23f. These and further propositions which could be part of a reform of the minimum reserves in the US were already included in a publication of the Federal Reserve Bank of New York in 1993. However, even today an indirect way of paying interest on balances at the Fed exists. It consists of not paying out interest in the form of "cash" but in the form of "vouchers" (earnings credits) with which services of the Fed can be paid. However, earnings credits are only paid for balances which are held according to a special contractual declaration. In this declaration ("clearing-balance contract") the credit institutions oblige themselves to hold a fixed amount of balances in addition to the minimum reserves on their accounts at the Fed (Anderson/Rasche, 2001, 57; see also the item "required clearing balances" in Table 1). "All balances are held in a unified account. At the end of each two-week period, the Fed

with a term of three months. They are offered monthly. To get a loan from the Eurosystem the credit institutions have to deliver collateral. This could take place either as a pledge or as a transfer of securities within a repurchase agreement.

In contrast to the Eurosystem the Fed still uses the term “open market operations” in the traditional way. Open market operations are only purchases and sales of bonds, which could take place either as outright operations or as repurchase agreements. Therefore, the term “open market operations” is used in a much broader sense by the Eurosystem than by the Fed. The Eurosystem injects liquidity mainly via short-term loans in the form of reverse transactions, whereas the Fed provides central bank money mainly via (outright) purchases of (government) bonds.

Finally, the Eurosystem has at its disposal so-called “Standing Facilities”. These operations are carried out on the initiative of the credit institutions. They are designed symmetrically and provide or absorb liquidity with an overnight maturity. The marginal lending facility offers the opportunity to credit institutions to get liquidity overnight. The amounts are not limited if a credit institution has enough collateral. On the other hand there is the deposit facility which enables credit institutions to deposit excess liquidity. The standing facilities shall facilitate the liquidity management of the credit institutions. The interest rate on the marginal lending facility is higher than the interest rate for the main refinancing operations, whereas the interest rate on the deposit facility is below it. The incentive for banks to use standing facilities is significantly reduced by the rates applied to them, which are normally unfavourable when compared with market rates.

Within the “discount window” the Fed offers loans to credit institutions.²⁶ The interest rate which is charged for this is traditionally called the “discount rate”. The discount window is in particular designed for credit institutions with liquidity problems.²⁷ The use of the discount credit is combined with more intensive bank supervision on the part of the Fed. If market participants know that an institute uses this instrument, its creditworthiness decreases. Therefore, the use of discount credits is usually relatively insignificant (see Chart 2).²⁸ In the last years a reform and reactivation of discount policy was discussed within the Fed. This was

determines whether a bank has satisfied its clearing balance requirement, based on a bank’s average holdings of balances that were not used to meet reserve requirements.” (Blenck et al., 2001, 25)

²⁶ The discount window should not be confused with the “Diskontpolitik” of the Deutsche Bundesbank, which existed until 1998.

²⁷ Here we concentrate on the most important form of the discount credit, the so-called Adjustment Credit Program.

²⁸ “The situation changed in the early 1990s, a series of episodes of financial distress among banks entrenched the view that discount window borrowing was a sign of weakness. Since then, despite the return to strength of the banking system, this perception has persisted and has resulted in great reluctance to turn to the window, regardless of the market cost of funds.” Borio 2001, 14.

due, inter alia, to a possibly decreasing supply of government bonds in the future due to public budget surpluses.²⁹ If it is no longer feasible to offer enough liquidity through purchases of government bonds the central bank has to offer loans - for example in the form of the main refinancing operations of the Eurosystem - to provide the liquidity the credit institutions need (in addition to or instead of A.2b comes A.2a in Chart 2). As a further alternative a reshaping of the discount window in the direction of the marginal lending facility of the Eurosystem was discussed. However, the administrative conditions which (so far) have prevented a stronger use of this instrument must be eliminated, irregardless of the direction these attempts may take.^{30, 31}

6. Money market as operational field³²

The central starting point for the instruments of both central banks is the money market. On the money market, the credit institutions trade funds at the central bank (P.2 in Chart 1). Such transactions do not lead to a change of the amount of existing base money, they only cause a redistribution of the overall volume between the credit institutions. From the point of view of an individual bank, operations with the central bank and in the money market fulfil the same function. Both support the balancing of changing liquidity needs.

In the money market there are different contract periods. There is the overnight market (overnight maturity) on the one hand and longer contract periods on the other (e.g. 1-month, 3-month, 12-month money market). While central banks can control the interest rate on the overnight market most directly, they only have an indirect influence on the longer-term interest rates, namely via the market participants' expectations concerning future conditions on the overnight market. The influence of the central bank on the longer-term interest rates therefore essentially depends on the signals it sends to market participants. Consequently, the signalling strategy of the central bank has a decisive role in the transmission process (Anker, 2001, 13-16). The signalling strategy of the Fed is very clear in this context. It publishes a target for the interest rate for day-to-day (overnight) money (the so-called "Federal Funds

²⁹ Since autumn 2001 fiscal policy has been eased. So, at the moment, it is uncertain if a long-term reduction in government debt will take place or not.

³⁰ See Hakkio/Sellon, 2000, for a discussion of the discount window as well as reform approaches in detail.

³¹ "The surge in borrowing following the September 11 terrorist attacks demonstrated, however, that the discount window can perform a crucial stabilizing function, providing temporary liquidity in times of crisis", Pakko, 2001. This is no argument against a reform of the discount window because the providing of temporary liquidity could easily be taken into consideration. The marginal lending facility of the Eurosystem fulfils this function, too.

³² Borio, 1997, gives a view of the operational aspects of monetary policy at different central banks.

Rate Target") and in addition, since February 2000, a so-called "balance of risks", i.e. an appraisal of whether the economy tends more towards inflation or weakness in the future.^{33,34} In the case of the Eurosystem, the interest rate for the main refinancing operations is the guiding interest rate and has a signalling function for the overnight money market.³⁵ Since the Eurosystem has offered the main refinancing operations via a variable rate tender (June 2000), the minimum bid rate signals the current monetary policy stance. The main refinancing operations have a maturity of two weeks. They are offered on a weekly basis. Thus, they are a close substitute to overnight money in the money market. However, the main refinancing operations are not a perfect substitute since the Eurosystem is not permanently present in the market. Consequently, the Eurosystem does not completely determine the overnight interest rate. This is evident in Chart 4 which also shows that the movement of the interest rate for overnight money is limited upwards by the marginal lending rate and downwards by the deposit rate.

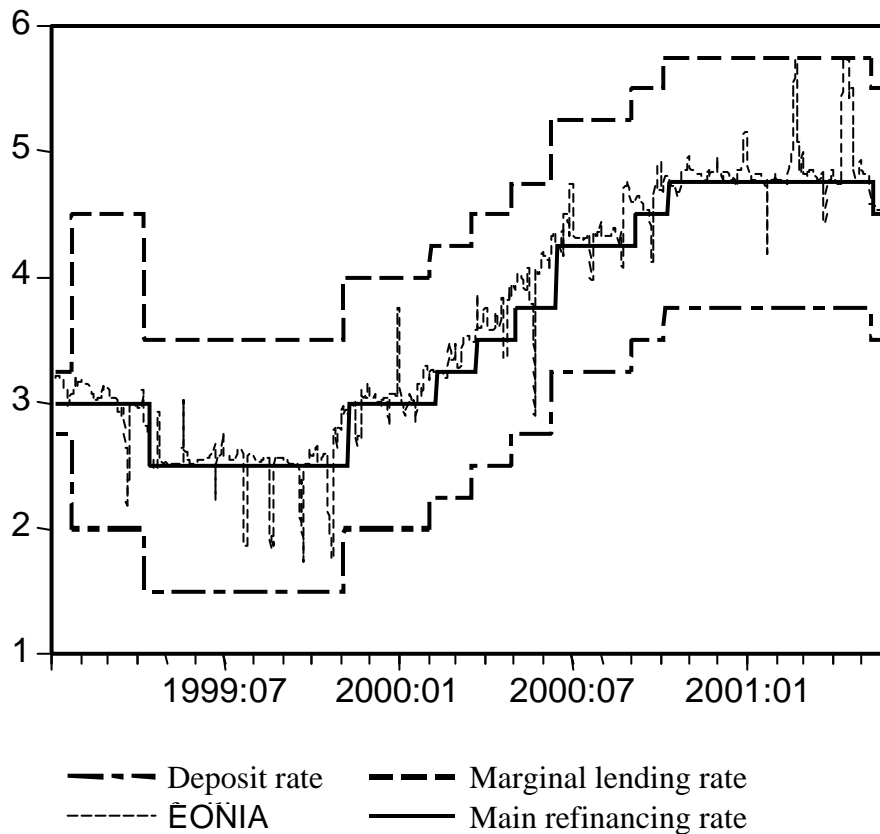
The averaging provision of required reserves helps to stabilize short-term interest rates. During the maintenance period the deposits on accounts with the Eurosystem can exceed or fall below the reserve requirement. The decisive point is that on average the deposits meet the reserve requirement. Demand and supply shocks in the money market can thus be compensated because credit institutions can draw on their reserve account. This automatically reduces interest rate volatility without an intervention of the central bank (for details see Görgens et al., 2002, ch. II.4 and Bindseil, 1997).

Chart 4: The interest rate corridor of the Eurosystem

³³ "In February 1994 (...) the Fed adopted a new policy procedure. Instead of keeping the federal funds rate target secret, as it had done previously, the Fed now announced any federal funds rate target change." Mishkin, 2001, 473. From February 1999 to February 2000 the Fed published a so-called "bias" toward tightening or easing of its interest rate policy instead of the "balance of risks". The indicator function of the "bias" is analyzed by Lapp/Pearce, 2000.

³⁴ After the Fed was exempted from supporting the price of government securities in 1951, it always had the federal funds rate as a target for its monetary policy in mind. Officially, until the end of the 60s the Fed policy was based on the "free reserves" and from 1979 - 1982 on the "non-borrowed reserves". However, a notion of the desired federal funds rate was always behind it. This approach was used for political reasons. In this way, the Fed could pass the "responsibility" for interest rates to the "market" and the Fed did not come under the pressure of politicians. See for this also Friedman, 2000, esp. 48-50 and Hetzel/Leach, 2001b, 57f.

³⁵ See Goergens et al., 2002, ch. II.4, for details how the Eurosystem steers the money market.

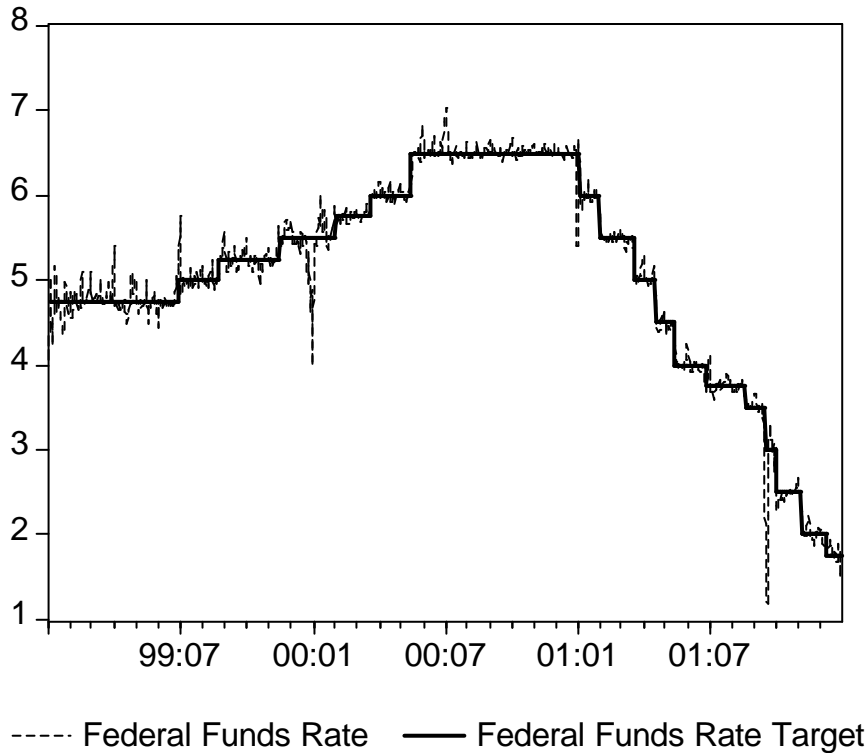


To control the Federal Funds Rate the Fed publishes an interest rate target, the so-called Federal Funds Rate Target. A change in this target rate automatically leads to a change in the expectations of market participants and thus normally to a change of the Federal Funds Rate (“open mouth operations”). Technically the Fed steers the Federal Funds Rate via open market operations to reach the target (Hakkio/Sellon, 2000, 8; Borio, 1997, 10f.). In doing this the Fed was quite successful in recent years as shown in Chart 5.

Within the framework of open market operations, the Fed buys and sells (government) bonds. Since the market for these instruments is big, deep and liquid, the transactions of the Fed hardly ever influence the price (interest rate) of these papers. This is intentional since the Fed policy is only to influence the liquidity of the banking system through its open market operations to steer the Federal Funds Rate.³⁶

Chart 5: Federal Funds Rate Target and Federal Funds Rate

³⁶ "Changes in the target federal funds rate cause changes in the actual federal funds rate with little or no immediate action by the Trading Desk. However, traditional “open market operations“ are the fundamentals that underlie these announcement or expectations effects.“ (Taylor, 2001, 45 f.). Open mouth operations are also discussed by Guthrie/Wright, 2000 and Thornton, 2000.



Both in the case of the Eurosystem and the Fed, the central starting point is the interest rate for overnight money.³⁷ In the euro area the focus of attention is the so-called EONIA (Euro Overnight Index Average). The EONIA represents an average overnight money market interest rate. In the US the decisive interest rate is the “Daily Effective Federal Funds Rate”, which is a weighted average of the daily rates on trades reported by brokers (Taylor, 2001, 36). Thus, both central banks steer a short-term interest rate. Accordingly, the short-term interest rate is usually called an “operating target or objective” of monetary policy (Borio, 2001, 10).³⁸ Both central banks do not envisage controlling the monetary base but the price of the central bank money. A control of the price (interest rate) has the advantage that erratic variations of money market interest rates and irritations on the financial markets caused by it can be avoided.

³⁷ “Currently, all the central banks in industrial countries implement monetary policy through market-oriented instruments geared to influencing closely short-term interest rates as operating objectives. ... It is this relative unglamorous and often obscure corner of the financial markets that the ultimate source of the central banks’ power to influence economic activity resides.” Borio, 2001, 3.

³⁸ “This mechanism became established in the UK in the 1890s, as Richard Sayers has documented (Sayers, 1957, 8-19), in the USA in the 1920s after the founding of the Fed, and in most other developed countries with their own central banks in the opening decades of the twentieth century. The key objective of central banks was to make the (short-term) interest rate that they set “effective”, initially for the purpose of defending their gold reserves (and hence the fixed exchange rate), but subsequently for a variety of other (domestic) objectives. Open market operations ... were invariably designed with a view towards making the central bank’s chosen key short-term rate effective in determining the set of other shorter-term market rates and *not* in order to achieve any predetermined level of monetary base“ Goodhart, 2001b, 14f; similar Orphanides, 2001,49.

According to traditional money supply theory (“the monetary base concept”) a certain amount of monetary base (B) may create a multiple amount of money (M). This is shown in the following equation:

$$M = m \cdot B,$$

where m is the money multiplier.

The monetary base concept allows the calculation of the (theoretical) maximum creation of money. If this concept is to have any practical benefit for monetary policy, the money multiplier has to be sufficiently predictable and the central banks must be able and willing to control the monetary base. In the case of the Eurosystem and the Fed at least the latter is not the case. Consequently, the monetary base is an endogenous variable. This is in sharp contrast to some statements dealing with the money supply process from a purely theoretical point of view.³⁹ “In their analysis most economists have assumed that Central Banks “exogenously” set the high-powered monetary base, so that (short-term) interest rates are “endogenously” set in the money market. Vicky Chick is one of the few economists to emphasize that the above analysis is wrong. Central Banks set short-term interest rates according to some “reaction function” and the monetary base is an endogenous variable.” (Goodhart, 2001a, 1).

7. Summary and conclusions

This paper has attempted to compare the Eurosystem and the Federal Reserve System. The institutional structure, the monetary policy strategy, the monetary policy instruments and the operating procedures of the two central banks were the central points. The institutional structure is rather similar but the main tasks and the legal status are different. Whereas the main task of the Eurosystem is clearly spelled out (price stability), the Fed has several tasks leading to some ambiguity. In this context it is also important that the independent status of the Eurosystem is guaranteed by international law (EU Treaty) whereas the status of the Fed depends on Congress because the Constitution gives to Congress the power to coin money and to set its value. Therefore, the Fed cannot deviate too much from the Congress members’ views as the legislation could be changed at all times. Regarding the instruments and the

³⁹ See for example Mankiw, 2000, 491: “In fact, the Fed controls the money supply indirectly by altering either the monetary base or the reserve-deposit ratio.” Neither the Fed nor the Eurosystem have changed the reserve-deposit rate (reserve ratio) in the last years. In the US the reserve ratio is (in principle) 10 % (since 1992) in the Euro area 2 % (since the Eurosystem was established in 1999). Neither the Fed nor the Eurosystem use variations in the reserve ratio to control the money supply. The minimum reserves have totally different functions (mainly to stabilize money market interest rates and to create a liquidity shortage). To fulfil these functions it is not necessary to change the reserve ratio. See Goodhart, 2001b, for a discussion of the “endogeneity of money” and Gørgens/Ruckriegel, 2000, 100-110, 139-145 for the money supply process with “endogenous” money.

operating procedures of monetary policy there are similarities in the design of the minimum reserves and the operating target. In both cases the overnight interest rate is the operating target of monetary policy. Apart from required reserves, the instruments of monetary policy are different. The differences in institutional and instrumental respect can be traced back to historical factors, legal problems of the change of existing arrangements and a different understanding of monetary policy. In this context the Eurosystem has had the advantage of introducing all arrangements according to the knowledge of monetary policy and theory at the end of the 20th century. In sum, the Eurosystem must be classified as the superior system under efficiency aspects. Especially, the absence of an explicit strategy of the Fed has been obvious for some years. This could be a disadvantage after Alan Greenspan leaves office. Thus, it is extremely urgent that the Fed looks for an appropriate monetary policy strategy.⁴⁰

⁴⁰ See Meyer, 2001b, for a first official step in this direction.

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