View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Research Papers in Economics

ECONSTOR

WWW.ECONSTOR.EU

Der Open-Access-Publikationsserver der ZBW – Leibniz-Informationszentrum Wirtschaft
The Open Access Publication Server of the ZBW – Leibniz Information Centre for Economics

von Hagen, Jürgen; Brückner, Matthias

Working Paper

Monetary policy in unknown territory: The European Central Bank in the early years

ZEI working paper, No. B 18-2001

Provided in cooperation with:
Rheinische Friedrich-Wilhelms-Universität Bonn

Suggested citation: von Hagen, Jürgen; Brückner, Matthias (2001) : Monetary policy in unknown territory: The European Central Bank in the early years, ZEI working paper, No. B 18-2001, http://hdl.handle.net/10419/39617

Nutzungsbedingungen:
Die ZBW räumt Ihnen als Nutzerin/Nutzer das unentgeltliche, räumlich unbeschränkte und zeitlich auf die Dauer des Schutzrechts beschränkte einfache Recht ein, das ausgewählte Werk im Rahmen der unter
→ http://www.econstor.eu/dspace/Nutzungsbedingungen
nachzulesenden vollständigen Nutzungsbedingungen zu vervielfältigen, mit denen die Nutzerin/der Nutzer sich durch die erste Nutzung einverstanden erklärt.

Terms of use:
The ZBW grants you, the user, the non-exclusive right to use the selected work free of charge, territorially unrestricted and within the time limit of the term of the property rights according to the terms specified at
→ http://www.econstor.eu/dspace/Nutzungsbedingungen
By the first use of the selected work the user agrees and declares to comply with these terms of use.

ZBW Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Mitglied der Leibniz-Gemeinschaft

Zentrum für Europäische Integrationsforschung
Center for European Integration Studies
Rheinische Friedrich-Wilhelms-Universität Bonn

Working Paper

Jürgen von Hagen and Matthias Brückner

Monetary Policy in Unknown Territory. The European Central Bank in the Early Years

B 18
2001

Monetary Policy in Unknown Territory
The European Central Bank in the Early Years

By

Jürgen von Hagen

ZEI, University of Bonn, Indiana University, and CEPR

and

Matthias Brückner

ZEI, University of Bonn

Revised version[##]

August 2001

Correspondance:
ZEI
Walter Flex Str. 3
D-53113 Bonn
Germany
Tel +49-228-739199
Fax +49-228-731809
Email: vonhagen@uni-bonn.de

##We thank our discussants Vitor Gaspar and Stephen Cecchetti, David E. Altig, and an anonymous referee for helpful comments and suggestions.

1. Introduction

The creation of a monetary union in Europe on 1 January 1999 is undoubtedly one of the largest macro and politico-economic experiments in modern history. It was the cap stone of the so-called 'Maastricht Process' designed to achieve macro economic convergence, which had shaped monetary and fiscal policies in the countries striving for membership in European Monetary Union (EMU) over much of the 1990s.[1] The start of EMU was marked by the conversion of the national currencies of the member states into euros and the beginning of the operations of the new Euro System, the new European Central Bank (ECB) and the national central banks of the participating states (NCBs).[2] While euro cash rested in the form of the previous national currencies for the first three years, interbank and most non-cash payments have been denominated in euros since the start and European financial markets quickly adopted the euro as of account. The replacement of the national currency signs by euro cash at the start of 2002 will complete the introduction of EMU.

The new EMU has a combined population 11 percent larger than that of the US, and a combined GDP of 61 percent of US GDP.[3] Like the US, and in sharp contrast to the individual member states, it a fairly closed economy, whose trade with third countries is about 20 percent of GDP. EMU has created a large financial area with a combined stock market capitalization initially of 28 percent of that of the US and a securities market with an initial value of about 60 percent of the US market.[4] By 2000, the combined stock market valuation of the euro economy had risen to about 37 percent of that of the US, and its securities market value to about 69 percent of the US market, suggesting that EMU has stimulated financial market growth. Due to institutional and regulatory differences, financial market integration is still less than perfect, but market-driven integration proceeds rapidly.[5]

Despite the large degree of nominal convergence achieved at the end of the 1990s, the start of EMU was surrounded by many uncertainties. Little was known (and is) about the properties and the stability of basic macroeconomic relations in the new monetary area such

---

[1] For a review of fiscal policies in the EMU member states during the 1990s see Hughes-Hallett, Strauch and von Hagen (2001).

[2] In addition to the Euro system, there is also the European System of Central Banks (ESCB), which consists of the ECB and the NCBs of the European Union member states.

[3] The following data are from European Commission, European Economy Statistical Appendix Fall 2000. EMU started with Austria, Belgium, Denmark, Germany, Finland, France, Ireland, Italy, Luxembourg, Portugal, and Spain. Greece joined on 1 January 2001.

[4] These data are for 1998 and taken from von Hagen (1999a).

[5] See e.g. European Commission (1997), IMF (2001b) and Danthine et al. (2000).

as its money demand function.[6] Aggregate data for the euro area were not readily available and had to be constructed from national sources on the basis of newly developed, common definitions. Reconstructed time series data span only one or two decades, which makes the estimation of empirical models difficult, and even the data now available leave open serious questions of aggregation.[7] More than two years after the start of the common monetary policy, the first empirical macro models of the euro economy are only starting to appear.[8] Monetary policy was thus entering unknown territory.

The institutional environment of the common monetary policy constituted further unknown territory. By delegating the common monetary policy to the European System of Central Banks (ESCB) and giving the ECB the task of executing the monetary policy determined by the ESCB, the Maastricht Treaty (Art. 3 and 5 of the Statutes of the ESCB) suggests that the ECB is subordinated to the NCBs. However, Art. 14.3 of the same statutes holds that the NCBs are an "integral part of the ESCB and act according to the directives of the ECB," suggesting that the latter is superior to the former. According to the ECB, the NCB presidents sit in the ECB Council as individuals rather than as representatives of their individual institutions (Gaspar et al, 2001), implying that the NCB presidents would not take into account any country-specific circumstances when making their decisions. But this reading of the Treaty is not uncontested, as legal scholars point out that the membership of the NCB presidents in the Council comes only as a result of their positions, not by personal appointment (Herdegen, 1998). In view of this, how the ECB Council members, coming from very different countries and traditions, could agree on a common monetary policy, to what extent that policy would be affected by national circumstances and preferences, and how it

[6] A number of empirical studies in the 1990s pointed to the existence of a conventional money demand function at the EU and showed that its stability exceeded that of national money demand functions. See e.g. Kremers and Lane (1992), Fagan and Henry (1999), Browne et al. (1997). However, these studies are plagued with aggregation problems that made the interpretation of these results difficult, see e.g. Wesche (1997) and Arnold and de Vries (2000), who argue that the stability of the aggregate function is a statistical artefact.

[7] See e.g. Gaspar (2000). In public statements, the ECB's chief economist Otmar Issing has pointed to the difficulties created by the lack of euro-area macroeconomic data and their history, which imples that, compared to his experience at the Bundesbank, his staff finds it much more difficult to explain data irregularities on the basis of historical analogies and experience.

[8] See Fagan et al. (2001), Coenen and Wieland (2000).

could be communicated effectively to a very heterogeneous European public have attracted a lot of interest in the public and academic debates preceding the start of EMU.[9]

This paper reviews the experiences of the new central bank and its monetary policy in the early years of EMU. In section 2, we provide some institutional background. In section 3, we discuss the ECB's strategy and its monetary policy so far. In section 4, we look at the evolution of monetary conditions in the euro economy and assess the central bank's policy on that basis. Section 5 concludes.

2. The ECB and the Euro System: Institutional Background

The Maastricht Treaty provides the institutional framework for the ECB. The Treaty requires that the NCBs of all participating states must be politically independent. The ECB is similarly independent from the governments of the member states and the political bodies of the European Union. The ECB is owned by the NCBs.

Monetary policy decisions are made by the Governing Council (ECB Council, for short) whose members are the NCB presidents and the six members of the ECB Board.[10] Formally, Council decisions are taken by majority vote, with each member having one vote and the ECB president a second one in the case of a tie. The ECB Board is responsible for preparing the meetings of the ECB Council. In doing so, it relies on its own staff, but it also uses the input of a number of Euro System Committees, which include staff members of the NCBs and of which the Monetary Policy Committee is the most important one. The established practice now is that the ECB Council members meet informally on the eve of ECB Council meetings to discuss monetary policy developments in the euro economy. The monetary policy discussion at the official meeting is opened with a statement by the chief economist, which gives the Board and the chief economist in particular considerable agenda setting power.[11] Numerous statements by the ECB president, Wim Duisenberg, indicate that the Council takes its decision by consensus or near-consensus rather than simple majority. In most instances, the debate seems to continue until a broad consensus is reached about

[9] See von Hagen and Süppel (1994), De Grauwe et al. (1999), Dornbusch et al. (1998), Cecchetti et al. (1999), Brückner (1997) among others.

[10] The president of the European Council and a member of the European Commission have the right to participate in ECB Council meetings.

[11] There are other indications as well that the ECB Board operates very much as a collegiate body. See Marshall (1999).

the monetary policy proposal presented to the Council. In both aspects, the ECB Council seems to follow the practice of the Bundesbank Council in earlier years (von Hagen, 1999c).

This procedural practice is important, because it diminishes the role of the median voter and his preferences in ECB Council decisions. The chief economist's role as agenda setter in monetary-policy debates implies that an NCB president proposing an alternative policy would thus have to justify any deviation from the chief economist's proposal and find convincing arguments why this would serve the euro economy better. Formal voting models show that consensus voting protects the chief economist's proposal against alternatives. Assuming that the chief economist always argues from an aggregate, euro-area perspective, the established procedure thus assures that country specific preferences and asymmetric shocks hitting individual member countries, which might be reflected in proposals submitted by individual NCBs, do not affect the common monetary policy in significant ways (von Hagen, 1999b).[12]

A significant feature of the Treaty is that it mandates the ECB to regard price stability as the principal objective of monetary policy, a heritage from a similar mandate in Germany's Bundesbank Act. But the Treaty does not define what price stability means in operational terms. The independence of the central bank as defined in the Treaty implies that such a definition can only be supplied by the ECB itself, a point we return to later. The principal mandate is qualified (Art. 105(1)) by the call to support the general economic policy in the European Community contribute to the policy goals defined in Art 2 as long as this does not compromise the goal of price stability. As in the Bundesbank case, where a similar qualification exists, this can be expected to remain inconsequential for the ECB: First, because it relates to "general" policies rather than specific actions of the governments, second because it relates to economic policy "in" rather than "of" the Community and there are at least fifteen different ones of the former. The view presented in Issing et al (2001), that the ECB does not regard output stabilization as a secondary goal for monetary policy, is

[12] Note that given this procedure, the chief economist's power to shape Council decisions increases as the number of NCB presidents on Council increases. This is because, in a larger Council, any deviation from the chief economist's proposal must win more votes to be adopted. In contrast to Alesina et al. (2001), who simply assume that the ECB Council decides by majority vote, we conclude that the actual procedure implies that future enlargements of EMU will strengthen the power of the ECB Board in monetary policy decisions.

consistent with this.[13] The European Parliament, through its Committee on Monetary and Financial Affairs, has repeatedly called upon the ECB to explain its goals and intentions under Art. 105(1). So far, the ECB has denied such explanations which could be read as commitments to other monetary policy goals in addition to price stability.

While monetary policy decision-making is centralized in the ECB Council, the actual implementation of monetary policy is largely decentralized. Key features of ECB monetary policy operations are the imposition of an interest-bearing reserve requirement on bank deposits, the provision of automatic-access lending and deposit facilities for banks at the Euro System at prefixed interest rates, which establish a floor and a ceiling for overnight money market rates, and repurchase operations (Repos), i.e., reversible open market operations in eligible securities, as the main tool for creating central bank money. So far, the ECB has almost completely refrained from outright open market purchases or sales or foreign exchange market interventions. The provision that reserves averaged over a month are counted against the reserve requirement assures that the daily volatility of money market rates remains low even without frequent central bank interventions.

This design reflects the desire to involve the NCBs as much as possible in the actual implementation of the common monetary policy, which is mandated by the ESCB Statutes. Apart from the institutional interest in keeping high staff numbers (Marshall, 1999), there is probably a strategic motivation for this. Frequent money market interventions would be difficult to coordinate among the national central banks and would, therefore, create a tendency for centralized operations. An ECB permanently active in the market would be in a much stronger position relative to the NCBs in determining the course of monetary policy. Being active in the market between ECB Council meetings would allow the ECB Board to confront the Council with interest rate developments that would be difficult to reverse without upsetting the markets. The NCBs probably resisted such a design fearing a loss of influence over the common monetary policy.[14]

---

[13] Specifically, Issing et al. express doubts about the power of monetary policy to systematically stabilize output and argue that low inflation is the ECB's best contribution to real growth.

[14] It is interesting to observe that the Bundesbank Council in the 1970s rejected a Bundesbank Board proposal for a more active open market policy on exactly these grounds. See von Hagen (1998).

3. Monetary Policy Strategy

3.1. The ECB's Monetary Policy Strategy

Monetary policy strategies can be regarded from different perspectives. Monetary economists typically focus on optimal-control type arguments. Assuming that the central bank wishes to minimize a quadratic loss function defined over inflation (and, possibly, some other variables), the question posed is how to achieve the smallest control-error variance. From this perspective, a strategy serves primarily to deal with the time lags and uncertainties in the link between the central bank's instruments and its objectives. A key issue then is the choice of an intermediate target, a variable that can be observed faster and more frequently than the ultimate target variables. Under an intermediate target strategy, keeping the intermediate target on some target path over time helps the central bank to achieve its ultimate targets. The preparatory work of the ECB's institutional precursor, the European Monetary Institute (EMI, 1997) had narrowed the ECB's strategy choices in this regard to the alternatives of monetary targeting or inflation forecast targeting.

A second perspective is the importance of a strategy for communicating with the public. A strategy provides a framework for explaining current and defending past central bank actions in public (Gaspar et al., 2001). The EMI's (1997) list of "general principles" for assessing a monetary policy strategy emphasized this aspect: A strategy must convey the impression that the central bank can and intends to pursue a well-defined medium-term objective, it must enhance *accountability* through the formulation and announcement of targets; it must be sufficiently *transparent* for the public to understand why the central bank adopted a given policy; and it must be compatible with central bank independence. Issing et al. (2001, p. 34) argue that the adoption of a strategy is an "attempt to characterize to the best possible extent, given the imperfect knowledge of the economy, how the central bank will respond to the arrival of new information." From this angle, the public announcement of a strategy is important to gain credibility.

The third perspective considers the role of a monetary strategy for regulating the flow of information and structuring the deliberations within the central bank. From this angle, a strategy shapes the decision making processes, with important implications for the distribution of strategic powers in the central bank (see Tietmeyer, 1996; von Hagen, 1999c;

Gaspar et al, 2001). In this vein, the ECB (2001, p. 46) explains the purpose of strategy as assuring that monetary policy decisions are made in a consistent and coherent way.

In October 1998, the ECB (1998, 1999) presented its strategy. It is based on a definition of price stability, and two "Pillars" that form the basis for the assessment of current developments and interest-rate decisions.

3.1.1. Price Stability

The ECB defines price stability as an annual increase in the 'Harmonized CPI,' its main gauge of average inflation in the euro area, below two percent. Initial doubts in the public debate that this implied a tolerance for deflation were soon rejected. The two-percent limit on inflation is another heritage from former Bundesbank practices. Issing et al (2001) point out that it is also in agreement with the stated preferences of European governments as expressed several times in the European Council's "Broad Economic Guidelines."

Like the Bundesbank in the past, the ECB regards price stability thus defined as a goal to be achieved only in "the medium run," a period of unspecified length. This implies that it would tolerate temporary moves of inflation outside the target range. The lack of an operational definition of the "medium term" is a visible contrast to the practice of central banks pursuing explicit inflation targets in recent years. For example, the Bank of England's inflation target is for annual inflation two years ahead. The Bank of Sweden (1997, p. 27) writes that "The Riksbank has formulated [its objective] as limiting the annual increase in the price level to 2 percent, ...". The ECB's unwillingness to define a more precise time horizon for its goal of price stability has been criticized by several authors arguing that the vagueness of the "medium run" reduces the public's ability to form expectations about future price and monetary developments and that it deflects accountability (e.g. Gali, 2001).

Specifying the time horizon over which price stability is to be reached touches on two issues. The first is an optimal-control question: Given a shock causing a rise in inflation, how should the adjustment to this shock be distributed over time? The answer to this question depends on the central bank's preferences and the properties of the economy. Smets (2000) and the papers discussed there show that the optimal horizon is a function of the relative weight of price stability compared to output stability in the central bank's loss function. Given the ECB's unambiguous mandate for price stability, this suggests that it should aim at a rather short horizon. Smets also shows that the optimal time horizon becomes shorter, if the economy is more 'forward-looking', i.e. forward looking expectations dominate backward

looking expectations embodied in wage contracts and price setting, and if the slope of the Phillips curve increases. One might argue that the ECB wanted to avoid a more specific definition of its time horizon because of its uncertainty about the empirical characteristics of the euro economy in these regards.

The second issue is whether price stability is regarded as a (not necessarily constant) price level target or a target only for the inflation rate, i.e., whether or not it is compatible with base drift in the price level. Faced with a non-monetary shock to the price level, a central bank targeting the inflation rate would allow base drift and merely aim at bringing inflation back to its target. In contrast, a central bank pursuing a price level target would have to bring the price level back to its target path and, therefore, engage in a stronger and longer-lasting monetary contraction.[15] In view of this, price level targets have traditionally been regarded as inappropriate as they would cause greater variability in output, inflation and interest rates. Recent studies, however, suggest that they may have superior stabilization properties at low inflation and nominal interest rates.[16] Smets (2000) finds that the optimal time horizon for a price level target is generally longer than the optimal time horizon for an inflation target. Given that the total monetary response to an inflationary shock is larger under a price level target, avoiding excessive output instability calls for distributing it over a longer time period.

The difference between targeting inflation and targeting the price level matters also for reasons of political economy. Price level targeting provides those who are negatively affected by rising prices with better protection against the consequences of fiscal expansions and does so at some cost to those benefitting from expansions in output. Therefore, the choice between targeting inflation or the price level requires a value judgement from the central bank (Fischer, 1996). Unless they share this value judgement, targeting the price level may lead to more intense conflicts between the governments and the central bank.

From this perspective, the ECB's unwillingness to make its target horizon for price stability more precise may reflect its unwillingness to reveal its choice between targeting inflation and targeting the price level and the desire to leave room for a flexible choice of the distribution of monetary policy responses to fiscal and other shocks over time. A priori,

---

[15] Note that, as long as the target path of the price level is positively sloped, this does not imply that the central bank has to force a reduction in the price level. Instead, it can maintain a lower growth rate until the target path is met again.

[16] See e.g. Svensson (1999). An example would be a deflationary shock to the price level, which, given a price level target, triggers an increase in inflation expectations and a decline in the real interest rate.

aiming at annual headline inflation below two percent “in the medium run” is compatible with both targeting the average inflation rate and allowing for base drift and with targeting the price level along a path with a slope below two percent. With no further explanation, the observer can only find out with hindsight, possibly over a lengthy time period, how the central bank reacted to non-monetary shocks to the price level. Interestingly, the Bundesbank’s past policies following the bursts of inflation on the 1970s and the early 1990s seemed consistent with a price level objective, although the Bank never made this objective explicit (von Hagen, 1995). In view of this, a suggestive interpretation of the ECB’s unwillingness to clearly define a target horizon is the hope that this imprecision would allow the bank to pursue a more ambitious target with less political resistance. The drawback is that the beneficial, stabilizing effects on inflation expectations will only come about once the public has fully understood the central bank’s true intentions through experience.

3.1.2. The First Pillar

The key characteristic of the First Pillar is the announcement of a reference value for the annual growth rate of a broad monetary aggregate, M3. The term “reference value“ rather than target serves to indicate that the ECB does not target M3 in a rigid, mechanical sense. Like the Bundesbank’s earlier practice, the assessment of monetary developments does not focus narrowly on M3 growth but includes other monetary and credit aggregates. A further similarity is the derivation of the reference value on the basis of a simple velocity equation. The reference value takes the growth rate of potential output less an assumed velocity trend as a starting point and adds the implicit target inflation rate. In October 1998, the assumed growth rate of potential output was 2.0 – 2.5%, while the assumed trend in velocity was a decline of (-0.5) – (-1.0)%. The announced reference value was 4.5% (ECB, 1999). Taking midpoints for the growth rate estimates implies a target inflation rate of 1.5%.

At first glance, the ECB’s First Pillar seems to look like the Bundesbank’s flexible monetary targeting in the past.[17] The Bundesbank repeatedly affirmed that it was willing to tolerate temporary deviations from its monetary target (a two-percent corridor for annual M3 growth), if this was deemed compatible with low inflation. Nevertheless, monetary targets were a good predictor of money growth in the medium run (Neumann and von Hagen, 1993). However, the ECB has frequently emphasized that it does not regard M3 growth as an

[17] Marshall (1999, p. 278) quotes Tietmeyer proposing this view.

intermediate target at all. ECB (2001, p 48) states that „the ECB does not attempt to keep M3 growth at the reference value at any particular point in time by manipulating interest rates." The ECB has explained that it deems monetary targeting as inappropriate for fear of instabilities in the demand for money and measurement problems with monetary aggregates (ECB 2001, p.48). The repeated emphasis of the differences between the reference value and (even a flexible form of) monetary targeting reject the allegation of Alesina et al. (2001) that the First Pillar simply serves to pretend that the ECB conducts its monetary policy like the Bundesbank in the past. Instead, the reference value serves as a yardstick to assess risks the central bank's ultimate target, inflation. This gives M3 growth and monetary developments the status of information variables in monetary policy decisions.

3.1.3. The Second Pillar

The Second Pillar consists of a „broadly-based assessment of the outlook for future price developments" in parallel with the First Pillar (ECB, 1998). Initially, the Second Pillar represented an analysis of short-run price developments in the euro area, based on a large and unspecified number of economic and financial variables, including measures of real activity, wage cost, asset prices, fiscal policy indicators, and indicators of business and consumer confidence (ECB 1999). No framework was specified how these variables would be used to assess price developments, nor their relative weights in such assessments. The Second Pillar thus adds an opaque part to the ECB's strategy. Issing et al. (2001, p. 74) explain that the relative importance of these variables changes all the time and that there is „no permanently valid way to organize the assessment in a logically consistent manner."

The nature of the Second Pillar appears to have changed since the introduction of the Second Pillar. Angeloni et al. (1999) and Issing et al. (2001) drop business and consumer confidence indicators and instead add inflation expectations derived from asset prices and market surveys to the elements of the Second Pillar. Gaspar et al. (2001, p. 13) explain that „analysis [under the Second Pillar] is typically centered on the effects of interactions between supply and demand and / or cost pressures on pricing behavior." In contrast to Issing's et al. explanation, this suggests that the analysis is indeed organized in some consistent

framework of analysis. The ECB's (2001) explanation of the staff projections, which it started to publish in its Monthly Bulletin in December 2000, supports that view.[18]

One interpretation of this gradual development of a more consistent framework under the Second Pillar is that it is becoming equivalent to inflation forecast targeting. The benefit of such an interpretation is that it increases the transparency of this Pillar. However, Gaspar et al. (2001) reject this interpretation and the ECB (2001) explains that it does not regard inflation forecast targeting as a sufficient framework for monetary policy. Like the First Pillar, the Second Pillar is merely a collection of information variables used to assess risks to price stability. Thus, the ECB's strategy is best characterized as a direct-targeting approach.

3.1.3. Reconciling the Two Pillars

The presentation of the Two Pillars has left ECB observers and commentators puzzled and Issing et al. (2001) acknowledge at least partially that the Two-Pillar structure makes the strategy hard to comprehend. Part of the confusion resulted from the commentator's own wish to read the Two-Pillar strategy as an intermediate-target strategy in disguise (either monetary or inflation forecast targeting.) Accepting that it is not still raises two questions: Why are there two Pillars rather than a unified framework for analysing risks to price stability; and, given that there are two Pillars, what is their relative weight in ECB monetary policy decisions?

According to the ECB, the Two-Pillar structure reflects the fundamental uncertainty about its macro economic environment and the transmission of monetary policy. ECB (2001, p 54) explains that it was chosen because of the multiplicity of „models" of the transmission process in the current literature, some of which emphasize „the role of money" for inflation, while other emphasize „non-monetary factors." The First Pillar thus stands for models reserving a prominent role for money in the central bank's analysis of threats to price stability. This role is justified by the claim that „inflation is ultimately a monetary phenomenon" (ECB 1999, p. 47). The ECB frequently points to the close correlation between

[18] These projections are conditional forecasts based on the assumption of no policy change. As noted by Gali (2001) the December projections have rather low precision. For example, the projected HICP inflation rate for 2001 is 1.8-2.8 percent. The ECB explains that this range corresponds to twice the average absolute error of previous forecasts. This translates into a confidence level of 57 percent (Gali, 2001). Applying a more conventional 95 percent confidence band would correspond to a range of 0.7 – 3.9 percent. It may be, of course, that due to the shortage of data the ECB just can't do better.

money growth and inflation in the medium and long run to support that claim (e.g., Issing et al. 2001, ECB 2001). The Second Pillar, in contrast, makes room for models of inflation that focus on other aspects of the macro economy such as output, demand, and labor market conditions and asset prices, and that have a more short-term orientation.

At a closer look, however, this distinction between the First and the Second Pillar seems more artificial than helpful. Taken literally, a „First-Pillar model“ would have to be one where the link between money growth and inflation does not operate through the interaction of aggregate demand and supply. Not even a classical model with fully flexible prices would have that property. While for expository convenience such models are often presented as saying that the price level „clears“ the money market, this is just a short-cut through a transmission process in which a monetary expansion works its way through the entire economy. Similarly, models of the new Keynesian and new Neoclassical syntheses are often written in ways that hide the importance of monetary aggregates because these are not the focus of the analysis, but it is certainly true that monetary policy plays an essential role in them and that they embed correlations between money growth and inflation. Under any reasonable interpretation, such models would, therefore, fall under the First Pillar, too. But then „Second-Pillar models“ would have to give no role to money and monetary policy for inflation at all. It seems unlikely that this is what the ECB has in mind. If not, it is hard to see how the expository differences between models commonly used in the academic and policy debates in the past decade support a substantive distinction between the two Pillars.

Some authors have taken this conclusion as a reason for arguing that the ECB should abolish its First Pillar and disregard monetary aggregates altogether in its assessment of risks to price stability (Gali 2001, Alesina et al. 2001). Two points are commonly made to support this claim. The first is that monetary variables have little or no information value for inflation over other variables in Granger causality tests. The fallacies of this argument are well known. Suppose the central bank manipulates interest rates to steer money growth in ways to achieve price stability. Variations in the interest rate then carry (most of) the information about variations in monetary aggregates and the marginal information value of such aggregates is unsurprisingly low. Furthermore, the closer inflation is kept to its target, the smaller the information value in the variables used to steer it, unless the target varies systematically with other variables. Thus, causality regressions have no relevance for the value of monetary variables in the assessment of inflation risks.

The second point commonly made is that recent macro-economic models do not assign money a „special" role in the transmission process of monetary policy. The fallacy of this argument is that it confuses statements about the language of economists (i.e., modeling conventions) with empirical hypotheses, and that the former are obviously not relevant to the policy issue. A related point, noted by Gali (2001) is that the long-run correlation between money growth and inflation, emphasized in the ECB's justification of the First Pillar, does not prove any causality from money to prices. This is trivially true, since causality is a theoretical concept, not an empirical one (Cooley and LeRoy, 1985). Its theoretical strength cannot be decided from data and depends, among other things, the central bank's own policy. In sum, the grounds for neglecting monetary variables in the analysis of risks to price stability presented in the current debate are weak.[19]

In contrast to ECB reasoning, model uncertainty does not justify the unwillingness to specify the relative weights of the two Pillars, either, as Issing et al. (2001) argue. If the central bank has a probability distribution over all economic models considered, this distribution defines the relative weights of the individual models in the decision making process. These weights ought to be relatively stable or vary in systematic ways that can be communicated. Brunner and Meltzer (1969) discuss model uncertainty in the sense that several, non-nested alternatives are available and the central bank has no prior probabilities for their validity. They argue that policy makers should adopt a mini-max strategy under such circumstances, i.e. monetary policy should aim at minimizing the largest possible damage under all alternative models considered. This is nicely formalized in von zur Muehlen (2001).[20] If this is the type of uncertainty the ECB is concerned with, optimal decision making results in rules that could be communicated in much clearer ways.

In sum, the recourse to model uncertainty does not yield a convincing justification of the Two-Pillar structure. The proper interpretation of the strategy, therefore, ought to lie elsewhere. Recall the ECB's explanation, that the strategy serves to structure internal debates and communication with the public. From this perspective, assigning a „prominent" role to money under the First Pillar is primarily a statement about what the ECB thinks it is, or

[19] A number of recent papers argue that the neglect of monetary aggregates in the conduct of monetary policy can result in rather unpleasant outcomes in precisely the type of models advocates of abolishing money from the set of variables the ECB should look at have in mind; see Christiano and Rostagno (2001) and the literature cited there.

[20] For a treatment of robust optimal control in forward-looking monetary policy models, see Hansen and Sargent (2000).

it should be, responsible for. Building on the proposition that „inflation is ultimately a monetary phenomenon“ the prominent role assigned to monetary aggregates and their analysis under the First Pillar indicates a responsibility for avoiding situations in which large and lasting expansions or contractions of monetary aggregates would result in bouts of inflation or deflation. In other words, the First Pillar signals a commitment to avoiding monetary policy errors resulting from uncontrolled monetary developments.

Viewed in this way, the First Pillar is much less than monetary targeting. In particular, it does not constrain monetary policy much as long as money growth rates remain in an acceptable range around the reference value. But the monetary reference value could still serve to structure the internal policy debate in the ECB Council. The ECB's Monthly Reports, which always begin with an analysis of monetary developments, reflect this point. Discussing monetary developments and how they would be affected by current interest rate policy regularly assures that policymakers in the central bank hold the medium-run consequences of their decisions in perspective. In the Bundesbank's earlier experience, monetary developments gained importance relative to other considerations in times of protracted monetary expansions and thus induced the Bundesbank to tighten monetary policy before inflation accelerated (von Hagen, 1999c). In our interpretation, the ECB's First Pillar thus serves as a commitment device disciplining the ECB Council against uncontrolled accelerations or decelerations of money growth, and a signal to the general public that the ECB will watch over monetary developments in this way. The Second Pillar then serves merely as an assurance that the ECB will not narrowmindedly neglect other, relevant information in the conduct of monetary policy. Interestingly, such an interpretation comes close to Christiano and Rostagno's (2001) recent proposal of a money growth constraint on a monetary policy characterized by a Taylor rule. These authors show that such a constraint anchors long-run inflation expectations and reduce the risk of indeterminacies and high-inflation equilibria that can arise from central bank policies following Taylor rules. Equally interesting, however, their analysis suggests that the ECB should frame its First Pillar in terms of a lower and an upper bound of money growth rates rather than a „reference value“.

The interpretation of the Two-Pillar strategy as a device for structuring debates within the central bank also explains why the ECB does not specify the relative weights of the two Pillars. First, the nature of the First Pillar implies that its weight should be variable: small in normal times and gaining importance in times of run-away monetary expansions. Second, Issing et al. (2001, p. 89) explain that, „from a procedural viewpoint, the synthesis“ [between

the two Pillars] „begins to take place first and foremost at the moment in which the analyses and options are elaborated and presented to the ECB decision making bodies“. Since this presentation is made by the chief economist, this means that weights are defined by the chief economist. Using the same weights consistently would increase the transparency of the strategy at this stage, but make the chief economist unable to use the information strategically in the ECB Council and determine the relative importance of medium and short-run considerations himself. Not committing to a priori weights strenghtens the leadership of the chief economist over the NCB presidents at Council meetings.

In this interpretation, the First Pillar of the strategy serves to assure the public of the ECB's medium-term orientation of avoiding any contribution of monetary policy to inflation. The opacity of the Second Pillar and its relation to the first one, however, hardly make this strategy an effective framework of communicating the ECB's shorter-run intentions to the public. This may be the price for achieving the strategic purposes in the internal decision making processes.

3.2. The Strategy at Work: Monetary Policy Decisions 1999-2001

Many observers had expected the ESCB to start its monetary policy by pushing up interest rates even if that was not justified by economic conditions, in order to prove that it was hard-nosed on inflation (e.g. Dornbusch et al., 1998). The opposite happened. In a concerted step generally considered the Euro System's first policy action, all NCBs reduced their interest rates to 3 percent on 3 December 1998.[21] While this could still be regarded as a reaction to the Russian financial crises, the rate cut on 8 April 1999 cannot, as all economies of the euro area except Germany and Italy had recovered from the 1999 slowdown by then.[22] As shown in Table 1, the April 1999 rate cut came in the presence of a money growth rate that was slightly too high, and low but rising inflation rates. The ECB reversed its course in November 1999. It first raised its rate by 50 then by another 100 basis points distributed over the following 12 months. The upward move over the year 2000 was accompanied first by increasing money growth rates, which started to fall only in the Summer of that year. Inflation

[21] The Bank of Italy cut its rate to 3.5 percent and to 3.0 percent later that month. See Gaspar (2000) for a review of this action.

[22] Gaspar (2000) explains that move as a protection against deflationary risks in the euro area, although signs of inflation creeping up already existed.

continued to increase until the Fall of 2000 and remains significantly above the two-percent ceiling set by the ECB. The ECB cut rates again in a surprise move in May 2001.

Table 1: Interest Rate Decisions

Date	Change in interest rate	Cumulated change in interest rate	Current money growth rate (M3)	Current inflation rate
12/08/98	-30	-30	5.84	0.8
04/08/99	-50	-80	5.26	1.1
11/05/99	50	-30	6.06	1.5
02/03/00	25	-05	6.11	2.0
06/08/00	50	45	5.37	2.4
10/05/00	25	70	5.11	2.7
05/10/01	-25	45	4.51 (April)	3.4

Recent literature has shown that Taylor rules are useful for describing and interpreting central bank policies under very diverse circumstances. The simple Taylor rule (Taylor, 1993) has found considerable attention as a benchmark rule for the ECB (see, e.g., Peersman and Smets, 1999, Taylor 1998), since it found empirical support for the euro area before the introduction of the euro (see, e.g., Gerlach and Schnabel, 2000). Moreover, Taylor rules are also explicitly employed as a benchmark by parts of the financial press, e.g., by the Financial Times Deutschland.[23] We base our exercise on the following specification:

$$(1) \qquad i_t = 4.0 + 1.2(\pi_t - \pi^{ob}) + 0.2 y_t$$

where i_t, π_t, π^{ob}, and y_t denote the nominal money market interest rate, the inflation rate, the inflation objective of the Central Bank, and the output gap. We set π^{ob} =1.5%, the value implicitly used by the ECB for their calculation of the reference value for M3, and assume an equilibrium interest rate of 4.0%, the sum of the ECB's assumed long-run real GDP growth rate and the inflation objective. The coefficients of this Taylor rule are similar to empirical estimates for the Bundesbank prior to EMU, a plausible starting point for the ECB (e.g. Faust et al. 2001). One advantage of this parameterization is that it yields a value of the Taylor rule for the euro area of 3% in December 1998, which corresponds to the actual value. In contrast to Faust et al., we use the current rather than an expected future inflation rate in the Taylor rule. Using an expected rate would not change the results below

[23] Alesina et al. (2001) and Faust et al. (2001) present similar studies of ECB monetary policy based on Taylor rules.

significantly, but calculating expected inflation rates from the data would force us to shorten the sample. In sum, we regard the specification of equation (1) as a plausible benchmark.

A well known problem in applying Taylor rules is the measurement of output gaps. In fact, the measurement problem is used as justification why the weight of output gaps is lower than the one on inflation (Smets, 1998). Measuring output gaps is even more of a problem in the euro area, where data concerning output is rather inaccurate and released rather late. Here, we used simple interpolations of several output gap estimates to increase the robustness of our measure. The estimates are from the OECD (OECD, 2001), IMF (IMF, 2001) and two series of estimates from the European Commission (EU, 2000 and 2001).

In Figure 1, we plot the Taylor rule from equation (1), labeled "euro", together with the ECB's main financing rate ("main rate".) The benchmark Taylor rule does not describe ECB interest rate decisions well over the time period from January 1999 onwards, as the actual rate was continuously lower than the rate implied by the Taylor rule. The difference between the two rates is not well explained by interest rate smoothing, either. Under interest rate smoothing, the actual rate would adjust to the rate implied by the Taylor rule in a gradual way, i.e.,

$$(2)\ \mathrm{i}_t = \lambda i_{t-1} + (1-\lambda)(4.0 + 1.2(\pi_t - \pi^{ob}) + 0.2 y_t),$$

where $\lambda > 0$. Figure 1, however, shows that the actual rate and the rate calculated from our Taylor rule move in opposite directions in at least two instances.

Figure 1: Taylor rules for the Euro Area I

How can the difference between the actual rate and the plausible benchmark be explained. As noted above, pre-EMU literature has placed much attention on the voting behavior of the NCB presidents on the ECB Board. If ECB Council decisions were taken by simple majority, the median NCB president would have considerable influence on them. Inflation rates in the EMU exhibited quite a large degree of cross-country variation during the period under consideration, as illustrated in Figure 2. This could move the ECB's interest rate away from the benchmark. To evaluate this possibility, we calculate individual Taylor rules based on equation (1) using individual country data, and compute the median Taylor rate for

each period. In Figure 1, we plot this rate, labeled “median.” The actual rate set in December 1998 corresponded exactly to the choice of the median NCB president. Following that, however, the median rule would have implied a much faster and larger rise in interest rates responding to the larger increase in the median inflation rate and the median output gap in the euro area. Thus, Figure 1 confirms that the median NCB president does not play a large role in shaping interest rate decisions.

Figure 2: Standard Deviation of Inflation Rates in the Euro Area

Another possibility is that the Council gives particular weight to the circumstances of the two largest economies, Germany and France. To explore this, we average the rates calculated from equation (1) for these two countries. The two rates are quite similar during this period, since Germany had lower inflation rates but also a lower output gap than France. The resulting rate, labeled “D-F”, is shown in Figure 1. It does more to explain the actual interest rate than the original Taylor rule (“euro.”) Interestingly, the ECB’s first interest rate move in April 1999 pushed the actual rate closer to the “D-F” rate. The subsequent movements in the actual rate seem quite consistent with a smooth adjustment of the actual rate to that implied by “D-F.” There is, thus, some suggestive evidence supporting the idea that the ECB Council places more weight on the economic developments in Germany and France.

Occasionally it is argued that the ECB cares for core inflation instead of headline inflation. In figure 2, we show a Taylor rule with HICP replaced by core inflation, measured as HICP minus food and energy prices (“core 1”). Due to the much flatter movements of core inflation over this period, the resulting Taylor rate is much flatter and misses the movements of the actual rate more than our first benchmark. A variation of this alternative is to replace headline by core inflation in the calculation of the Taylor and increase the weight on the output gap. This follows the conjecture by Faust et al from a similar exercise, that the ECB places more weight on output stabilization than the Bundesbank did in the past. Assuming a weight of 0.8 for output yields the rate labeled “core-2” in figure 2. This rule tracks the observed rate quite well between the start of EMU and early 2000. For most of the year 2000, however, the actual rate then followed the “D-F” line more closely and moved away from the “core-2” line. Only the ECB’s May 2001 interest rate move seemed to follow the “core-2” line more than the “D-F” line. There is, then, some preliminary evidence in the data

also that ECB's interest rate policy gave more weight on output stabilization than our original benchmark as suggested by Faust et al.

For a more formal test, we consider the regressions reported in Table 2, where the dependent variable is the actual interest rate

Table 2: Estimated Interest Rate Rules

	(1)	(2)
Constant	-0.23 (-0.62)	0.03 (0.13)
D-F	0.29 (2.73)	0.15 (2.67)
Core-2	0.85 (4.04)	
Lagged main rate		0.84 (12.64)
Standard deviation	0.37	0.17
ρ	0.75	0.01
R^2	0.86	0.96

Note: Number of observations = 32, dependent variable is "main rate." ρ is the first-order residual autocorrelation. Numbers in parentheses are t-ratios.

The first regression suggests that the ECB's interest rate policy can be explained as a mix of a Taylor rule for Germany and France and a Taylor rule focusing on core inflation and giving a relatively large weight to the euro area output gap. However, the residual autocorrelation is very high for this regression. The second regression models follows the interest-rate smoothing model and has the actual rate depend on its own lag and the Taylor rule for Germany and France. The table shows that this model explains the actual rate very well, and leads to a residual autocorrelation which is almost zero.[24] Adding "core-2" to this equation yields a negative, statistically insignificant coefficient for that variable. As a result, the ECB's policy is best described as following a Taylor rule focused on developments in Germany and France, augmented by a tendency for interest rate smoothing.

Our interpretation of these findings is that the ECB Board succeeded in emancipating itself quickly from the median country's perspective on monetary policy, and it did so by giving more weight to a policy responding to developments in France and Germany. The fact that the Taylor rules for Germany and France consistently called for lower rates than the median country's Taylor rule may have helped the ECB Board, as the resulting policy was less proactive than a policy focusing on euro area aggregates. The relatively large weight Germany and France seem to receive in ECB interest rate decisions may reflect the acknowledgment of the other Council members of the importance of these two countries for

European integration. Alternatively, it may reflect a shared view of the ECB Council that these two economies, which together represent half of the euro economy, reflect the medium run developments of the euro area better than aggregate euro-area data used to compute the euro-area Taylor rule. Whether or not that is true is an empirical question that remains to be resolved.

4. Monetary Relations in the Euro Area

In this section, we review the monetary developments in the euro area so far. We are mainly interested in two questions. First, is the link between money and prices empirically stable enough to support a monetary policy strategy focusing on money? Second, how did the ECB's monetary policy perform so far?

4.1. Money Demand

A number of empirical studies in the 1990s investigated the existence of a stable long-run money demand function for broad monetary aggregates at the EMU level, see e.g. Browne et al. (1997), Hayo (1999), Fagan and Henry (1999), Coenen and Vega (1999) and Brand and Cassola (2000). Generally, they conclude that the stability of money demand at the level of the monetary union is greater than the stability of national money demand functions. Broad money demand is found to have standard properties, i.e., long-run real income and price level elasticities of unity and a negative and significant elasticity with respect to the yield on alternative financial assets.

In Hayo et al. (1998), we have estimated a money demand function for M3 based on a cointegrating framework, using quarterly data data from 1979 – 1997. e use that estimate to derive the following, long-run money demand function for the euro area:

$$(3) \qquad m_t - p_t = y_t - 0.023 i_t \,,$$

where m, p, and y are the logs of the money supply, the GDP deflator, and real GDP, respectively, and i is the yield on 10-year government bonds in the euro area. Hayo (1999) finds a similar relationship using data from 1964 onwards, pointing to the stability of the long-

[24] The second-order autocorrelation is (-0.09).

run relationship. Here, we use this function to evaluate the monetary relationships in the euro area since the start of EMU. Note that, since our sample for estimation ends in 1997, all of the following exercises are true out-of-sample evaluations.

Equation (3) can be inverted to yield an equation for the velocity of M3. Figure 4 shows the actual velocity of M3 for the euro area from 1994 to 2000 together with the fitted values from equation (3). Comparing the estimated and the observed velocities confirms the considerable empirical stability of the money demand function. The average forecast error of the out-of-sample forecasting exercise is 0.5 percent. Over this period, actual velocity fell by almost 6.0 percent, consistent with the ECB's proposition of a trend decline in M3 velocity embedded in the calculation of the reference value for M3 growth. While the ECB interprets this decline as a fixed trend due to changes in portfolio habits and technological changes, our estimated model, which contains no trend, suggests that the gradual decline in velocity is a consequence of decline in long-term interest rates since the 1980s.

Figure 4: M3 Velocity

Figure 4 also plots a log-linear trend velocity assuming, as the ESCB does, a trend rate of (-0.75) percent. The estimated model outperforms the trend model clearly in the first part of the plot, where long-term rates were slightly increasing. In contrast, our long-run money demand function overestimates velocity somewhat in 2000, while the trend model underestimates it. Fitting a trend through the observed M3 velocity during the 1994-2000 period yields a slope parameter of (-0.43) percent with a standard error of (-0.038), which is significantly different from that assumed in the ECB's calculation of the monetary reference value. The implication is that the ECB's reference value is too large.

4.2. Money Growth

Apart from currency in circulation, M3 contains overnight deposits, deposits with fixed maturities of up to two years, deposits with statutory maturity of up to three months, repurchase agreements of financial institutions, money market fund shares and money market paper, and bank certificates of deposit and short-term obligations of maturities up to two years. Some of these elements of M3 are denominated in non-euro currencies, other elements are traded in secondary markets, implying that these elements are subject to valuation changes as their market prices change. In calculating the monthly growth rate of

M3, the ECB purges the monetary data from these valuation changes. The ECB's reasoning behind this is that changes in monetary assets caused by valuation changes rather than transactions would not cause portfolio adjustments affecting private spending behavior (ECB 2001). The empirical strength of this conjecture remains, however, unclear.

Relative to the balance sheet data, the adjusted money growth figures severely understate the monetary expansion from mid-1999 to early 2001. This is due mainly to the continuous depreciation of the euro during that period. At the peak of the monetary expansion in the Spring of 2000, the difference between the two series was about two percent. Short of a convincing justification for the adjustment, this implies that an inflation potential was building up in the euro area that was considerably higher than what the ECB inferred from its indicator. In contrast, the adjusted growth rates indicate much less of a monetary tightening after September 2000. There is, therefore, a risk that the focus on adjusted money growth rates introduces a bias into the ECB's monetary policy, one that underestimates inflation risks in times of a weakening of the external value of the euro and one that underestimates monetary tightening in times of an external revaluation.

Figure 5: Money Growth and Interest Rates

At the start of EMU, money growth was already higher than the reference value. Figure 5 shows that it accelerated after April 2000 and that this was driven mainly by a very rapid expansion of M1, which grew stronger following the decline in interest rates in the first months of 1999. Starting in the fall of that year, M1 growth came down quickly and substantially, responding to the rise in short-term rates. M3 growth peaked later than M1 and came down more gradually in the second half of 2000.

The difference between the two aggregates is due to portfolio shifts from non-monetary financial assets into the interest-bearing parts of M3. This is illustrated by the fact that the growth rates of money market funds and short-term obligations included in M3 fluctuated between 20 and 32 percent in the six months between October 2000 and March 2001. The ECB has argued recently that a large part of this increase is due to foreign holdings of short-term euro-denominated paper, which do not create inflationary pressures and, therefore, should not be allowed to affect the ECB's monetary policy (Duisenberg, 2001). Another likely reason for the rapid increase in these items is the turmoil in

international stock markets in recent months. Taking these items out of M3 would reduce the annual growth rate to 3.3 percent in the first quarter of 2001. This suggests that the broad monetary aggregate tends to underestimate the extent of a monetary contraction, an observation which resembles earlier experiences of the Bundesbank (von Hagen, 1993). The focus on a broad aggregate thus risks to maintain a tighter stance of monetary policy for longer than what is needed to maintain price stability.

4.3. Money Growth and Inflation in the Euro Area

In contrast, the First Pillar of the ECB's strategy relies on the proposition that excess money growth in an indicator for future inflation. Figure 6 shows the growth rates of M3 together with the CPI inflation rate since 1998. Euro area money growth started to accelerate in the fall of 1998, when inflation was still hovering around one percent. Inflation began to accelerate in the summer of 1999, and leveled out in the fall of 2000, a few months after the peak in M3 growth. Eyeballing thus suggests a positive relation between the two variables.

Figure 6: M3 Growth and Inflation

From this perspective, the most recent interest rate cut was justified, if the central bank is satisfied with bringing back inflation to rates below two percent after a period of higher rates. In contrast, an effort to bring inflation down to substantially lower rates in order to regain an average rate below two percent over time, would have called for maintaining the tight stance of monetary policy. Thus, the most recent decision is interesting as it indicates that the ECB's definition of price stability allows for base drift in the price level.

For a more systematic analysis, we apply our long-run money demand function to the concept of an equilibrium price level (von Hagen, 1995) or P*-model (Hallman et al., 1990) for the euro area. We solve the money demand function for the price level that would result if all prices adjusted immediately to current output, money and interest rates, i.e., the equilibrium price level:

$$(4) \qquad p_t^* = m_t - y^r_t + 0.023\, r_t$$

Next, we assume that the price level follows the equilibrium price level with a lag,

$$(5) \quad \Delta p_t = a + b\,(p^*_{t-4} - p_{t-4}) + u_t$$

The left hand side is the annual inflation rate. With b > 0, the actual price level adjusts to the equilibrium price level over time. We estimate this equation using quarterly data for the GDP deflator from 1995 to 2000. This yields the following equation:

(6) Δp_t = 0.99 + 0.2 ($p^*_{t-4} - p_{t-4}$) $R^2 = 0.66$, $F(1,24) = 42.0$

t-values: (6.5) (6.5)

All parameters are statistically significant at the 1% level. Thus, there is a statistically significant relationship between the observed inflation rate and the lagged difference between the equilibrium and the actual price level. A rise in the equilibrium price level is followed by an increase in euro-area inflation a year later. Figure 8, which plots the actual and the fitted inflation rates against the price gap shows that the fit of this model, simple and out-of-sample as it is, is quite high.[25] The implication is that the change in the equilibrium price level is an indicator of the future inflation potential caused by current monetary policy. A rising equilibrium price level indicates that the money supply is growing faster than the long-run money demand at current income and interest rates and that this discrepancy results in inflationary pressures.

Figure 7: Actual and predicted inflation rates based on price-gap model

The ECB's main inflation gauge is HCPI inflation rather than the change in the GDP deflator. While consumer prices react faster to exchange rate movements and variations in individual prices such as energy prices, one would still expect the HCPI to move in line with the GDP deflator in the longer run. To see whether this is true, and the equilibrium price level is a good indicator of the long-run development of the HCPI, too, we regress the HCPI inflation rate on our price gap. Following Gerlach and Svensson (2001), we include the change in oil prices lagged by four quarters in this regression. As before, we use data from 1995 to 2000. This yields the following regression model:

[25] There is some autocorrelation in the residuals of the regression, but the Durbin -Watson test is inconclusive. To address the problems resulting from the use of quarterly data of annual inflation rates, We also estimated this relationship based on quarter-to-quarter inflation rates and the price gap lagged one period. The results are very similar.

(7) $\Delta p_t = 0.86 + 0.21 (p^*_{t-4} - p_{t-4}) + 0.05\Delta p_{oil,t-1}$ $R^2 = 0.74$, $F(2,20) = 28.9$,

t-values: (5.9) (6.7) (5.4)

Again, the relationship holds quite well. Equation (7) indicates that a rise in the equilibrium price level will result in higher HCPI inflation rates after some time. These results are in line with Gerlach and Svensson (2001), who estimate a similar relationship between inflation and the price gap but assume a constant velocity of money.

The empirical exercises in this section lead us to three conclusions. First, the out-of-sample properties of our simple velocity model suggest that money demand in the euro area is sufficiently stable to support a monetary policy strategy that gives a prominent role to money. Second, money is a leading indicator for inflation in the euro area. Based on these results, the ECB could revise its strategy and pay closer attention on M3 growth in the future. Finally, the ECB allowed M3 to grow too much during the first years of EMU. Monetary policy thus contributed to the resurgence of inflation. Based on our calculations, the contribution of the price gap to HCPI inflation was about one percent in early 2001. With a more disciplined monetary policy in 1999 and 2000, the ECB could have held inflation below its two percent limit even in the face of the oil price hike.

5. Conclusions

In this paper, we have presented a review of the institutional background, the strategy, and the monetary policy performance of the ECB. A characteristic of this policy is the “Two-Pillar” strategy. The strategy does not rely on any intermediate target. Its Two-Pillar design serves to signal the ECB’s intention to prevent large and lasting monetary contractions or expansions that would endanger price stability. It also serves as a strategic instrument to focus deliberations on the ECB Council on monetary developments and give them a medium-run orientation. It does not, however, constrain ECB policy much in the shorter run nor enable the public to make informed guesses about the central bank’s policy in times when monetary aggregates show no signs of running away in either direction. In that sense, the strategy remains intransparent and leaves large room for discretionary manoeuvre. Empirical results based on Taylor rules suggest that ECB interest rate moves

were dominated by considerations focusing on economics developments in Germany and France rather than the euro area as a whole.

Monetary and inflation developments of the early years are consistent with the conjecture of a stable money demand function and a significant relationship between monetary and price developments in the euro area. Based on these relations, the data suggest that the ECB allowed the money supply to expand too much in the first year of EMU, with the consequence of rising inflation later on. This illustrates the risk of a strategy that regards monetary aggregates merely as constraints in the sense described above rather than as intermediate targets guiding monetary policy also in normal times. By revising its strategy and give monetary developments more weight in guiding central bank decisions over a shorter time horizon, the ECB could improve its success in achieving price stability.

References

Alesina, Alberto, Olivier Blanchard, Jordi Gali, Francesco Giavazzi, and Harald Uhlig (2001), *Defining a Macroeconomic Framework for the Euro Area*. Monitoring the ECB 3, London: CEPR

Angeloni, Ignazio, Vitor Gaspar, and Oreste Tristani (1999), „The Monetary Policy Strategy of the ECB.“ In: David Cobham and George Zis (eds.), *From EMS to EMU.* London: MacMillan Press

Arnold, Ivo, and Casper C. G. de Vries (2000), „Endogenous Financial Structure in the EMU.“ In: Jürgen von Hagen and Chris Waller (eds.), *Regional Aspects of Monetary Policy in Europe.* Boston: Kluwer

Bank of Sweden (1997), *Inflation Report*. Stockholm

Brand, Claus, and Nuno Cassola (2000), “A money demand system for Euro area M3.” ECB Working Paper 39.

Browne, F. X., Gabriel Fagan, and Jerome Henry (1997), “Money Demand in EU Countries: A Survey.” EMI Staff Paper No. 7, Frankfurt

Brückner, Matthias (1997), “Voting and Decisions in the ECB.” EUI Working Paper ECO 97/29

Brunner, Karl, and Allan H. Meltzer (1969), “The Nature of the Policy Problem.” in: Karl Brunner (ed.), *Targets and Indicators of Monetary Policy* San Francisco: Chandler Publishing Co.

Cecchetti, Steven, Margaret M. McConnell, and Gabriel Perez-Quiros (1999), “Policy Makers’ Revealed Preferences and the Output-Inflation Variability Trade-off. Implications for the European System of Central Banks.” Mimeo

Christiano, Lawrence J., and Massimo Rostagno (2001), “Money Growth Monitoring and the Taylor Rule.” Mimeo

Coenen, Günter, and Juan-Luis Vega (1999), “The Demand for M3 in the Euro Area.” ECB Working Paper 6

Coenen, Günter, and Volker Wieland (2000), “A Small, Estimated Euro-area Model With Rational Expectations and Nominal Rigidities.” ECB Working Paper 30

Cooley, Thomas F., and Stephen F. LeRoy (1985), “Atheoretical Macroeconometrics: A Critique”, *Journal of Monetary Economics* 16, 283-308.

Danthine, Jean – Pierre, Francesco Giavazzi, and Ernst-Ludwig von Thadden (2000), “European Financial Markets After EMU: A First Assessment.” CEPR Discussion Paper 2413

De Grauwe, Paul, Hans Dewachter, and Yunus Aksoy (1999), “Effectiveness of Monetary Policy in Euroland” *Empirica* 26, 299-318

Dornbusch, Rudiger, Carlo Favero, and Francesco Giavazzi (1998), “Immediate Challenges for the European Central Bank.” *Economic Policy* 26, 17-64

Duisenberg, Willem F. (2001), *Introductory Statement.* ECB Press conference 10 May

European Central Bank, (1998), “A Stability Oriented Monetary Policy Strategy for the ESCB.” Press Release, 13 October.

European Central Bank (1999), *Monthly Bulletin* January

European Central Bank (2001), *The Monetary Policy of the ECB.* Frankfurt: ECB

European Commission (1997), *The Impact of the Introduction of the Euro on European Capital Markets.* (Giovannini report) Euro Papers 3, Brussels

European Monetary Institute, EMI (1997), "The Single Monetary Policy in Stage Three". Frankfurt: EMI

EU (2000), European Economy. Economic Trends (Supplement A) No.1/2

EU (2001), European Economy. Economic Trends (Supplement A) No.3/4

Fagan, Gabriel, Jerome Henry, and Ricardo Mestre (2001), “An area-wide (AWM) model for the Euro area.” ECB Working Paper 42

Faust, Jon, John H. Rogers, and Jonathan H. Wright (2001), “An Empirical Comparison of Bundesbank and ECB Monetary Policy Rules.” International Finance Discussion Papers 705, Washington DC: Board of Governors of the Federal Reserve System

Fischer, Stanley (1996), “Why are Central Banks Pursuing Long-Run Price Stability.” Federal Reserve Bank of Kansas City Symposium Proceedings, 7-34

Gali, Jordi (2001), “Monetary Policy in the Early Years of EMU.” Paper presented at the European Commission Workshop on “The functioning of EMU: Challenges of the Early Years.”

Gaspar, Vitor (2000), “The Role of Monetary Policy Under Low Inflation.” Presentation at the IMES/Bank of Japan International Conference 3-4 July 2000

Gaspar, Vitor, Klaus Masuch, and Huw Pill (2001), “The ECB’s Monetary Policy Strategy: Responding to the Challenges of the Early Years.” Mimeo

Gerlach, Stefan and Gert Schnabel (2000), “The Taylor Rule and Interest Rates in the EMU Area”, Economics-Letters 67(2), 165-71

Gerlach, Stefan, and Lars E. O. Svensson (2001), “Money and Inflation in the Euro Area: A Case for Monetary Indicators? “ BIS Working Paper 98

Hansen, Lars, and Thomas Sargent (2000), “Robust Control and Filtering of Forward Looking Models.” Mimeo

Hayo, Bernd (1999), Estimating a European Demand for Money, *Scottish Journal of Political Economy* 46(3), 221-244, 1999.

Hayo, Bernd, Manfred J. M. Neumann, and Jürgen von Hagen (1998), “A Monetary Target for the ECB.” EMU Monitor Background Paper, Press conference 17 December 1998. Available for download at: www.zei.de.

Herdegen, Matthias (1998), “Kommentar zu Art 88 Grundgesetz”. Mimeo, University of Bonn

Hughes-Hallett, Andrew, Rolf R. Strauch, and Jürgen von Hagen (2001), “Budgetary

Consolidations in EMU." European Commission Economic Paper 148, Brussels, March

IMF (2001a), World Economic Outlook Database

IMF (2001b) "Monetary and Exchange Rate Policies of the Euro Area." Country Report 01/60

Issing, Otmar, Vitor Gaspar, Ignazio Angeloni, and O. Tristani (2001), *Monetary Policy in the Euro Area: Strategy and Decision-making at the European Central Bank*. Cambridge: Cambridge University Press

Kremers, Jereon and Timothy Lane (1992), "The Demand for Money in Europe". *IMF Staff Papers* 39, 730-37

Marshall, Matt (1999), *The Bank.*London: Random House

Neumann, Manfred J. M., and von Hagen, Jürgen(1993), "Germany." In: Michele Fratianni and Dominik Salvatore (eds.), *Monetary Policy in Industrialized Countries*. Greenwood Press

OECD (2001), Economic Outlook

Peersman, Geert, and Frank Smets (1999), "The Taylor Rule: A Useful Monetary Policy Benchmark for the Euro Area?", International-Finance 2(1), pp 85-116

Smets. Frank (1998), "Output gap uncertainty: does it matter for the Taylor rule?", BIS Working Paper 60

Smets, Frank (2000), "What Horizon for Price Stability?" ECB Working Paper 24, July

Svensson, Lars E. O. (1999), "How should monetary policy be conducted in a era of price stability?" mimeo

Taylor, John B. (1993), "Discretion Versus Policy Rules in Practice", Carnegie-Rochester Conference Series on Public Policy 39, pp. 195-214

Taylor, John B. (1998), "The Robustness and Efficiency of Monetary Policy Rules as Guidelines for Interest Rate Setting by the European Central Bank, Sveriges Riksbank Working Paper 58.

Tietmeyer, Hans (1996), "The Importance of Monetary Policy Strategy in Achieving Price Stability". In: Deutsche Bundesbank (ed.), *Monetary Strategies in Europe*. München: Vahlen 1996

Von Hagen, Jürgen (1993), "Money Demand, Money Supply, and Monetary Union – A Review of the German Monetary Union" *European Economic Review* 37, 803-36

Von Hagen, Jürgen, (1995), "Monetary and Inflation Targeting in Germany." In: Leonardo Leiderman and Lars E. O. Svensson (eds.) *Inflation Targeting.* London: CEPR

Von Hagen, Jürgen (1998), "A new Approach to Monetary Policy (1971-78)." Deutsche Bundesbank (ed.), *Fifty Years of the Deutsche Mark*. Oxford: Oxford University Press

Von Hagen, Jürgen (1999a), "Macroeconomic Consequences of the EMU." *Empirica* 26, 359-74

Von Hagen, Jürgen (1999b), "La Union Económina y Monetario: cuestiones y desafios de economía política." *Moneda y Crédito* 208, Segunda Epoca, 25-58

Von Hagen, Jürgen (1999c), "Money Growth Targeting by the Bundesbank." *Journal of Monetary Economics* 43, 681-701.

Von Hagen, Jürgen, and Ralph Süppel (1994), "Central Bank Constitutions for Federal Monetary Unions.", *European Economic Review* 38, 774-782

Von zur Mühlen, Peter (2001), "Activist vs. Non-Activist Monetary Policy: Optimal Rules under Extreme Uncertainty", FEDS Working paper 2001-2.

Wesche, Katrin (1997), "The Stability of European Money Demand: An Investigation of M3H." *Open Economies Review* 8, 371-91

Figure 1: Taylor Rules (I)

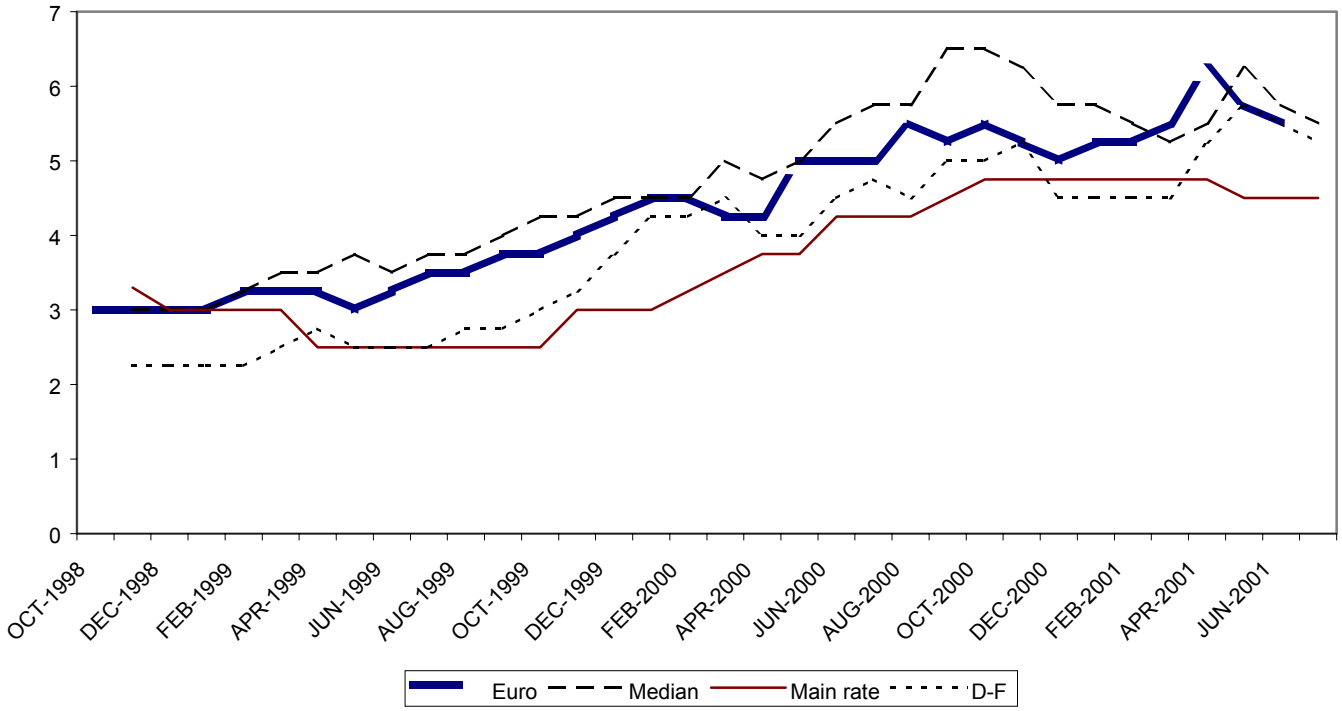


Figure 2: Standard Deviation and Range of Inflation Rates in the Euro Area

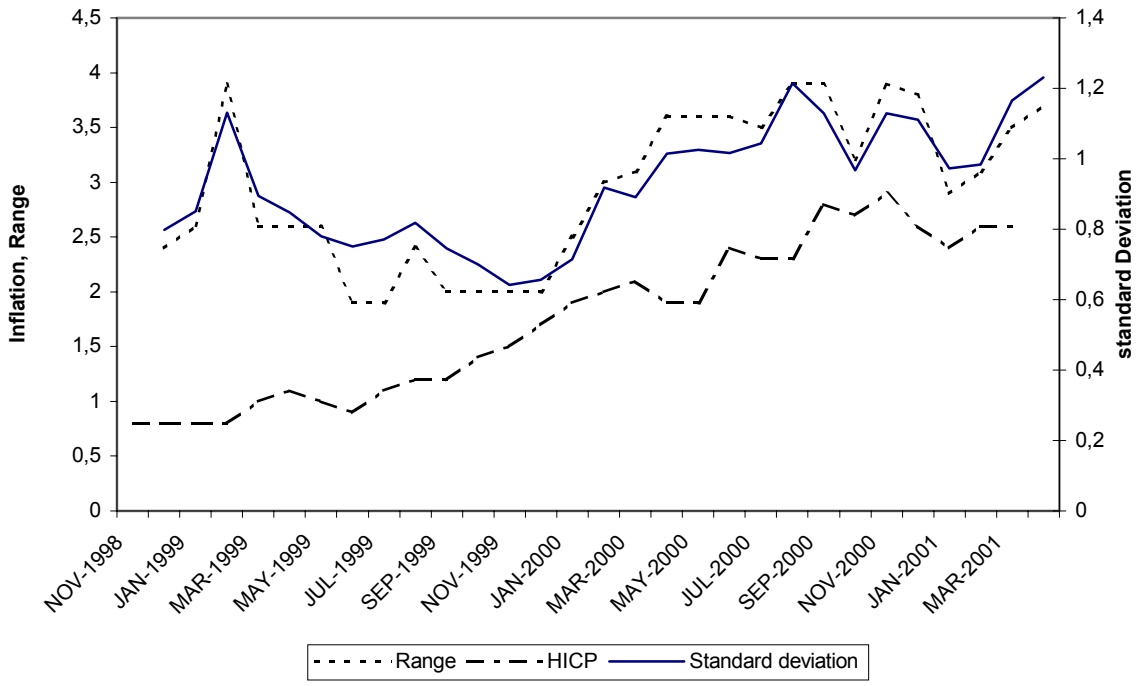


Figure 3: Taylor Rules (II)

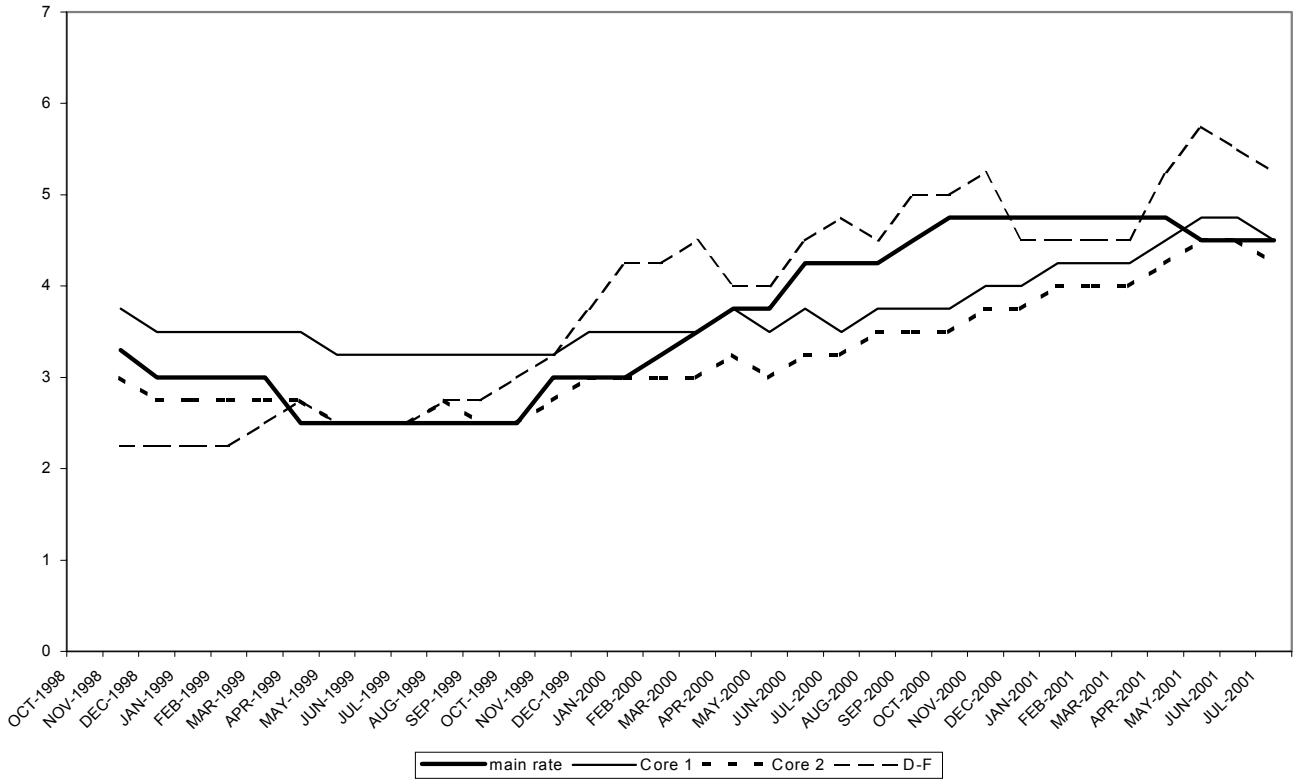


Figure 4: M3 Velocity

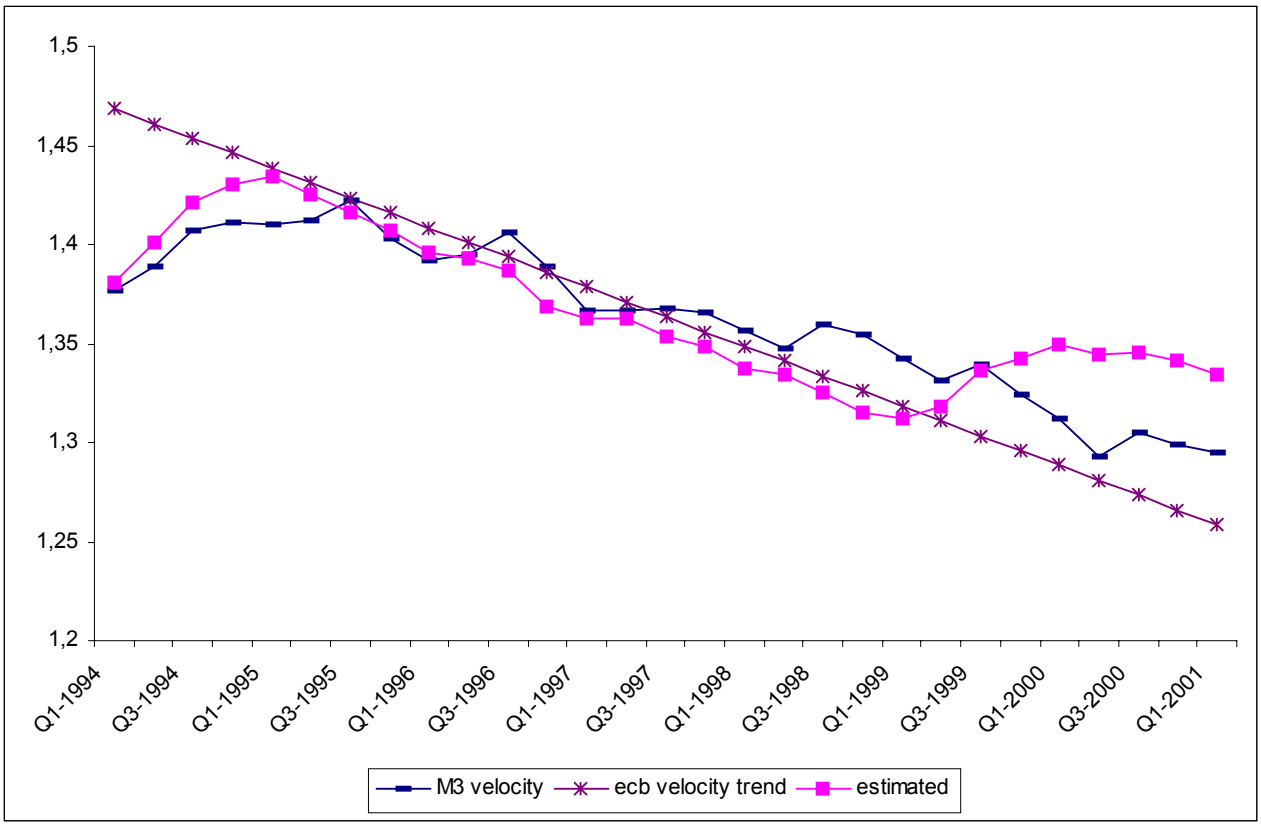


Figure 5: Money Growth and Interest Rates

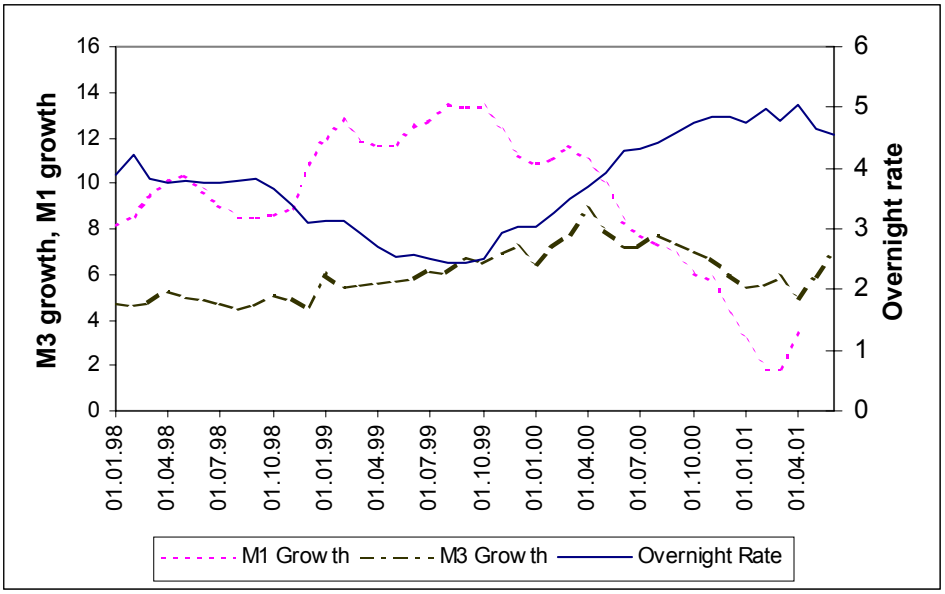


Figure 6: M3 Growth and Inflation

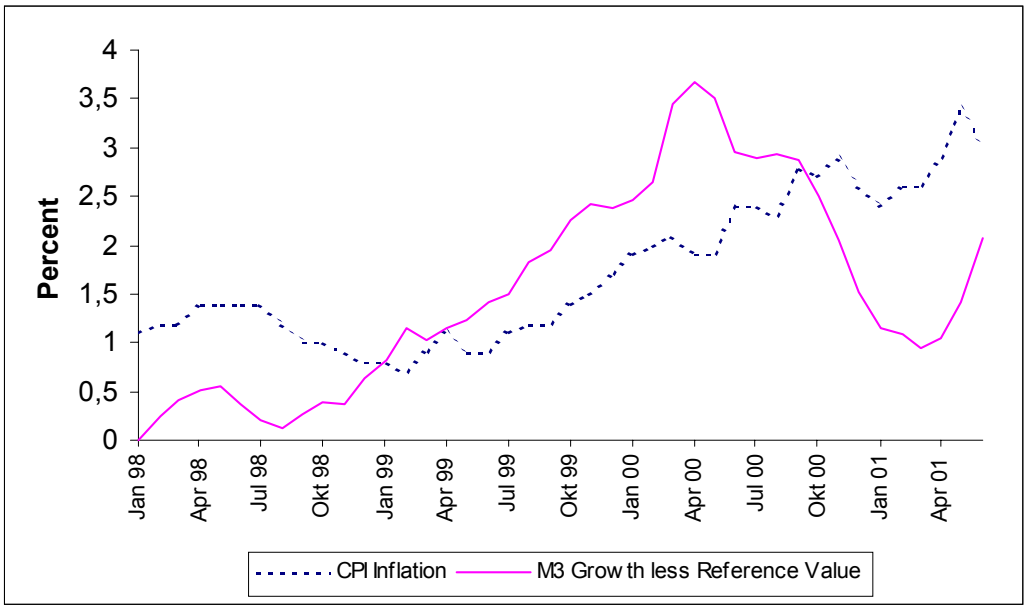
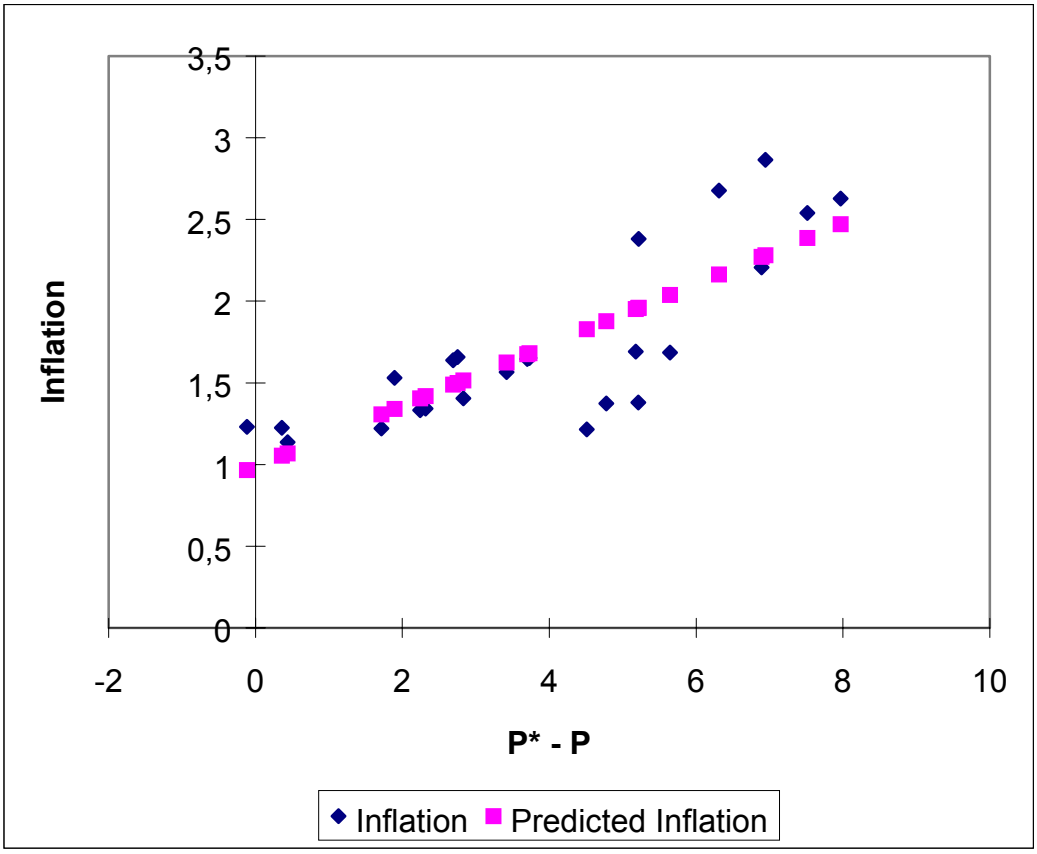


Figure 7: Actual and predicted inflation rates based on price-gap model



2008

B01-08	**Euro-Diplomatie durch gemeinsame „Wirtschaftsregierung“**	*Martin Seidel*

2007

B03-07	**Löhne und Steuern im Systemwettbewerb der Mitgliedstaaten der Europäischen Union**	*Martin Seidel*
B02-07	**Konsolidierung und Reform der Europäischen Union**	*Martin Seidel*
B01-07	**The Ratification of European Treaties - Legal and Constitutional Basis of a European Referendum.**	*Martin Seidel*

2006

B03-06	**Financial Frictions, Capital Reallocation, and Aggregate Fluctuations**	*Jürgen von Hagen, Haiping Zhang*
B02-06	**Financial Openness and Macroeconomic Volatility**	*Jürgen von Hagen, Haiping Zhang*
B01-06	**A Welfare Analysis of Capital Account Liberalization**	*Jürgen von Hagen, Haiping Zhang*

2005

B11-05	**Das Kompetenz- und Entscheidungssystem des Vertrages von Rom im Wandel seiner Funktion und Verfassung**	*Martin Seidel*
B10-05	**Die Schutzklauseln der Beitrittsverträge**	*Martin Seidel*
B09-05	**Measuring Tax Burdens in Europe**	*Guntram B. Wolff*
B08-05	**Remittances as Investment in the Absence of Altruism**	*Gabriel González-König*
B07-05	**Economic Integration in a Multicone World?**	*Christian Volpe Martincus, Jennifer Pédussel Wu*
B06-05	**Banking Sector (Under?)Development in Central and Eastern Europe**	*Jürgen von Hagen, Valeriya Dinger*
B05-05	**Regulatory Standards Can Lead to Predation**	*Stefan Lutz*
B04-05	**Währungspolitik als Sozialpolitik**	*Martin Seidel*
B03-05	**Public Education in an Integrated Europe: Studying to Migrate and Teaching to Stay?**	*Panu Poutvaara*
B02-05	**Voice of the Diaspora: An Analysis of Migrant Voting Behavior**	*Jan Fidrmuc, Orla Doyle*
B01-05	**Macroeconomic Adjustment in the New EU Member States**	*Jürgen von Hagen, Iulia Traistaru*

2004

B33-04	**The Effects of Transition and Political Instability On Foreign Direct Investment Inflows: Central Europe and the Balkans**	*Josef C. Brada, Ali M. Kutan, Taner M. Yigit*
B32-04	**The Choice of Exchange Rate Regimes in Developing Countries: A Mulitnominal Panal Analysis**	*Jürgen von Hagen, Jizhong Zhou*
B31-04	**Fear of Floating and Fear of Pegging: An Empirical Anaysis of De Facto Exchange Rate Regimes in Developing Countries**	*Jürgen von Hagen, Jizhong Zhou*
B30-04	**Der Vollzug von Gemeinschaftsrecht über die Mitgliedstaaten und seine Rolle für die EU und den Beitrittsprozess**	*Martin Seidel*
B29-04	**Deutschlands Wirtschaft, seine Schulden und die Unzulänglichkeiten der einheitlichen Geldpolitik im Eurosystem**	*Dieter Spethmann, Otto Steiger*
B28-04	**Fiscal Crises in U.S. Cities: Structural and Non-structural Causes**	*Guntram B. Wolff*
B27-04	**Firm Performance and Privatization in Ukraine**	*Galyna Grygorenko, Stefan Lutz*
B26-04	**Analyzing Trade Opening in Ukraine: Effects of a Customs Union with the EU**	*Oksana Harbuzyuk, Stefan Lutz*
B25-04	**Exchange Rate Risk and Convergence to the Euro**	*Lucjan T. Orlowski*
B24-04	**The Endogeneity of Money and the Eurosystem**	*Otto Steiger*
B23-04	**Which Lender of Last Resort for the Eurosystem?**	*Otto Steiger*
B22-04	**Non-Discretonary Monetary Policy: The Answer for Transition Economies?**	*Elham-Mafi Kreft, Steven F. Kreft*
B21-04	**The Effectiveness of Subsidies Revisited: Accounting for Wage and Employment Effects in Business R+D**	*Volker Reinthaler, Guntram B. Wolff*
B20-04	**Money Market Pressure and the Determinants of Banking Crises**	*Jürgen von Hagen, Tai-kuang Ho*
B19-04	**Die Stellung der Europäischen Zentralbank nach dem Verfassungsvertrag**	*Martin Seidel*

B18-04	**Transmission Channels of Business Cycles Synchronization in an Enlarged EMU**	*Iulia Traistaru*
B17-04	**Foreign Exchange Regime, the Real Exchange Rate and Current Account Sustainability: The Case of Turkey**	*Sübidey Togan, Hasan Ersel*
B16-04	**Does It Matter Where Immigrants Work? Traded Goods, Non-traded Goods, and Sector Specific Employment**	*Harry P. Bowen, Jennifer Pédussel Wu*
B15-04	**Do Economic Integration and Fiscal Competition Help to Explain Local Patterns?**	*Christian Volpe Martincus*
B14-04	**Euro Adoption and Maastricht Criteria: Rules or Discretion?**	*Jiri Jonas*
B13-04	**The Role of Electoral and Party Systems in the Development of Fiscal Institutions in the Central and Eastern European Countries**	*Sami Yläoutinen*
B12-04	**Measuring and Explaining Levels of Regional Economic Integration**	*Jennifer Pédussel Wu*
B11-04	**Economic Integration and Location of Manufacturing Activities: Evidence from MERCOSUR**	*Pablo Sanguinetti, Iulia Traistaru, Christian Volpe Martincus*
B10-04	**Economic Integration and Industry Location in Transition Countries**	*Laura Resmini*
B09-04	**Testing Creditor Moral Hazard in Souvereign Bond Markets: A Unified Theoretical Approach and Empirical Evidence**	*Ayse Y. Evrensel, Ali M. Kutan*
B08-04	**European Integration, Productivity Growth and Real Convergence**	*Taner M. Yigit, Ali M. Kutan*
B07-04	**The Contribution of Income, Social Capital, and Institutions to Human Well-being in Africa**	*Mina Baliamoune-Lutz, Stefan H. Lutz*
B06-04	**Rural Urban Inequality in Africa: A Panel Study of the Effects of Trade Liberalization and Financial Deepening**	*Mina Baliamoune-Lutz, Stefan H. Lutz*
B05-04	**Money Rules for the Eurozone Candidate Countries**	*Lucjan T. Orlowski*
B04-04	**Who is in Favor of Enlargement? Determinants of Support for EU Membership in the Candidate Countries' Referenda**	*Orla Doyle, Jan Fidrmuc*
B03-04	**Over- and Underbidding in Central Bank Open Market Operations Conducted as Fixed Rate Tender**	*Ulrich Bindseil*
B02-04	**Total Factor Productivity and Economic Freedom Implications for EU Enlargement**	*Ronald L. Moomaw, Euy Seok Yang*
B01-04	**Die neuen Schutzklauseln der Artikel 38 und 39 des Beitrittsvertrages: Schutz der alten Mitgliedstaaten vor Störungen durch die neuen Mitgliedstaaten**	*Martin Seidel*
2003		
B29-03	**Macroeconomic Implications of Low Inflation in the Euro Area**	*Jürgen von Hagen, Boris Hofmann*
B28-03	**The Effects of Transition and Political Instability on Foreign Direct Investment: Central Europe and the Balkans**	*Josef C. Brada, Ali M. Kutan, Taner M. Yigit*
B27-03	**The Performance of the Euribor Futures Market: Efficiency and the Impact of ECB Policy Announcements (Electronic Version of International Finance)**	*Kerstin Bernoth, Juergen von Hagen*
B26-03	**Souvereign Risk Premia in the European Government Bond Market (überarbeitete Version zum Herunterladen)**	*Kerstin Bernoth, Juergen von Hagen, Ludger Schulknecht*
B25-03	**How Flexible are Wages in EU Accession Countries?**	*Anna Iara, Iulia Traistaru*
B24-03	**Monetary Policy Reaction Functions: ECB versus Bundesbank**	*Bernd Hayo, Boris Hofmann*
B23-03	**Economic Integration and Manufacturing Concentration Patterns: Evidence from Mercosur**	*Iulia Traistaru, Christian Volpe Martincus*
B22-03	**Reformzwänge innerhalb der EU angesichts der Osterweiterung**	*Martin Seidel*
B21-03	**Reputation Flows: Contractual Disputes and the Channels for Inter-Firm Communication**	*William Pyle*
B20-03	**Urban Primacy, Gigantism, and International Trade: Evidence from Asia and the Americas**	*Ronald L. Moomaw, Mohammed A. Alwosabi*
B19-03	**An Empirical Analysis of Competing Explanations of Urban Primacy Evidence from Asia and the Americas**	*Ronald L. Moomaw, Mohammed A. Alwosabi*

B18-03	**The Effects of Regional and Industry-Wide FDI Spillovers on Export of Ukrainian Firms**	*Stefan H. Lutz, Oleksandr Talavera, Sang-Min Park*
B17-03	**Determinants of Inter-Regional Migration in the Baltic States**	*Mihails Hazans*
B16-03	**South-East Europe: Economic Performance, Perspectives, and Policy Challenges**	*Iulia Traistaru, Jürgen von Hagen*
B15-03	**Employed and Unemployed Search: The Marginal Willingness to Pay for Attributes in Lithuania, the US and the Netherlands**	*Jos van Ommeren, Mihails Hazans*
B14-03	**FCIs and Economic Activity: Some International Evidence**	*Charles Goodhart, Boris Hofmann*
B13-03	**The IS Curve and the Transmission of Monetary Policy: Is there a Puzzle?**	*Charles Goodhart, Boris Hofmann*
B12-03	**What Makes Regions in Eastern Europe Catching Up? The Role of Foreign Investment, Human Resources, and Geography**	*Gabriele Tondl, Goran Vuksic*
B11-03	**Die Weisungs- und Herrschaftsmacht der Europäischen Zentralbank im europäischen System der Zentralbanken - eine rechtliche Analyse**	*Martin Seidel*
B10-03	**Foreign Direct Investment and Perceptions of Vulnerability to Foreign Exchange Crises: Evidence from Transition Economies**	*Josef C. Brada, Vladimír Tomsík*
B09-03	**The European Central Bank and the Eurosystem: An Analysis of the Missing Central Monetary Institution in European Monetary Union**	*Gunnar Heinsohn, Otto Steiger*
B08-03	**The Determination of Capital Controls: Which Role Do Exchange Rate Regimes Play?**	*Jürgen von Hagen, Jizhong Zhou*
B07-03	**Nach Nizza und Stockholm: Stand des Binnenmarktes und Prioritäten für die Zukunft**	*Martin Seidel*
B06-03	**Fiscal Discipline and Growth in Euroland. Experiences with the Stability and Growth Pact**	*Jürgen von Hagen*
B05-03	**Reconsidering the Evidence: Are Eurozone Business Cycles Converging?**	*Michael Massmann, James Mitchell*
B04-03	**Do Ukrainian Firms Benefit from FDI?**	*Stefan H. Lutz, Oleksandr Talavera*
B03-03	**Europäische Steuerkoordination und die Schweiz**	*Stefan H. Lutz*
B02-03	**Commuting in the Baltic States: Patterns, Determinants, and Gains**	*Mihails Hazans*
B01-03	**Die Wirtschafts- und Währungsunion im rechtlichen und politischen Gefüge der Europäischen Union**	*Martin Seidel*
2002		
B30-02	**An Adverse Selection Model of Optimal Unemployment Assurance**	*Marcus Hagedorn, Ashok Kaul, Tim Mennel*
B29B-02	**Trade Agreements as Self-protection**	*Jennifer Pédussel Wu*
B29A-02	**Growth and Business Cycles with Imperfect Credit Markets**	*Debajyoti Chakrabarty*
B28-02	**Inequality, Politics and Economic Growth**	*Debajyoti Chakrabarty*
B27-02	**Poverty Traps and Growth in a Model of Endogenous Time Preference**	*Debajyoti Chakrabarty*
B26-02	**Monetary Convergence and Risk Premiums in the EU Candidate Countries**	*Lucjan T. Orlowski*
B25-02	**Trade Policy: *Institutional* Vs. *Economic* Factors**	*Stefan Lutz*
B24-02	**The Effects of Quotas on Vertical Intra-industry Trade**	*Stefan Lutz*
B23-02	**Legal Aspects of European Economic and Monetary Union**	*Martin Seidel*
B22-02	**Der Staat als *Lender of Last Resort* - oder: Die Achillesverse des Eurosystems**	*Otto Steiger*
B21-02	**Nominal and Real Stochastic Convergence Within the Transition Economies and to the European Union: Evidence from Panel Data**	*Ali M. Kutan, Taner M. Yigit*
B20-02	**The Impact of News, Oil Prices, and International Spillovers on Russian Fincancial Markets**	*Bernd Hayo, Ali M. Kutan*

B19-02	**East Germany: Transition with Unification, Experiments and Experiences**	*Jürgen von Hagen, Rolf R. Strauch, Guntram B. Wolff*
B18-02	**Regional Specialization and Employment Dynamics in Transition Countries**	*Iulia Traistaru, Guntram B. Wolff*
B17-02	**Specialization and Growth Patterns in Border Regions of Accession Countries**	*Laura Resmini*
B16-02	**Regional Specialization and Concentration of Industrial Activity in Accession Countries**	*Iulia Traistaru, Peter Nijkamp, Simonetta Longhi*
B15-02	**Does Broad Money Matter for Interest Rate Policy?**	*Matthias Brückner, Andreas Schaber*
B14-02	**The Long and Short of It: Global Liberalization, Poverty and Inequality**	*Christian E. Weller, Adam Hersch*
B13-02	**De Facto and Official Exchange Rate Regimes in Transition Economies**	*Jürgen von Hagen, Jizhong Zhou*
B12-02	**Argentina: The Anatomy of A Crisis**	*Jiri Jonas*
B11-02	**The Eurosystem and the Art of Central Banking**	*Gunnar Heinsohn, Otto Steiger*
B10-02	**National Origins of European Law: Towards an Autonomous System of European Law?**	*Martin Seidel*
B09-02	**Monetary Policy in the Euro Area - Lessons from the First Years**	*Volker Clausen, Bernd Hayo*
B08-02	**Has the Link Between the Spot and Forward Exchange Rates Broken Down? Evidence From Rolling Cointegration Tests**	*Ali M. Kutan, Su Zhou*
B07-02	**Perspektiven der Erweiterung der Europäischen Union**	*Martin Seidel*
B06-02	**Is There Asymmetry in Forward Exchange Rate Bias? Multi-Country Evidence**	*Su Zhou, Ali M. Kutan*
B05-02	**Real and Monetary Convergence Within the European Union and Between the European Union and Candidate Countries: A Rolling Cointegration Approach**	*Josef C. Brada, Ali M. Kutan, Su Zhou*
B04-02	**Asymmetric Monetary Policy Effects in EMU**	*Volker Clausen, Bernd Hayo*
B03-02	**The Choice of Exchange Rate Regimes: An Empirical Analysis for Transition Economies**	*Jürgen von Hagen, Jizhong Zhou*
B02-02	**The Euro System and the Federal Reserve System Compared: Facts and Challenges**	*Karlheinz Ruckriegel, Franz Seitz*
B01-02	**Does Inflation Targeting Matter?**	*Manfred J. M. Neumann, Jürgen von Hagen*
2001		
B29-01	**Is Kazakhstan Vulnerable to the Dutch Disease?**	*Karlygash Kuralbayeva, Ali M. Kutan, Michael L. Wyzan*
B28-01	**Political Economy of the Nice Treaty: Rebalancing the EU Council. The Future of European Agricultural Policies**	*Deutsch-Französisches Wirtschaftspolitisches Forum*
B27-01	**Investor Panic, IMF Actions, and Emerging Stock Market Returns and Volatility: A Panel Investigation**	*Bernd Hayo, Ali M. Kutan*
B26-01	**Regional Effects of Terrorism on Tourism: Evidence from Three Mediterranean Countries**	*Konstantinos Drakos, Ali M. Kutan*
B25-01	**Monetary Convergence of the EU Candidates to the Euro: A Theoretical Framework and Policy Implications**	*Lucjan T. Orlowski*
B24-01	**Disintegration and Trade**	*Jarko and Jan Fidrmuc*
B23-01	**Migration and Adjustment to Shocks in Transition Economies**	*Jan Fidrmuc*
B22-01	**Strategic Delegation and International Capital Taxation**	*Matthias Brückner*
B21-01	**Balkan and Mediterranean Candidates for European Union Membership: The Convergence of Their Monetary Policy With That of the Europaen Central Bank**	*Josef C. Brada, Ali M. Kutan*
B20-01	**An Empirical Inquiry of the Efficiency of Intergovernmental Transfers for Water Projects Based on the WRDA Data**	*Anna Rubinchik-Pessach*
B19-01	**Detrending and the Money-Output Link: International Evidence**	*R.W. Hafer, Ali M. Kutan*

B18-01	**Monetary Policy in Unknown Territory. The European Central Bank in the Early Years**	*Jürgen von Hagen, Matthias Brückner*
B17-01	**Executive Authority, the Personal Vote, and Budget Discipline in Latin American and Carribean Countries**	*Mark Hallerberg, Patrick Marier*
B16-01	**Sources of Inflation and Output Fluctuations in Poland and Hungary: Implications for Full Membership in the European Union**	*Selahattin Dibooglu, Ali M. Kutan*
B15-01	**Programs Without Alternative: Public Pensions in the OECD**	*Christian E. Weller*
B14-01	**Formal Fiscal Restraints and Budget Processes As Solutions to a Deficit and Spending Bias in Public Finances - U.S. Experience and Possible Lessons for EMU**	*Rolf R. Strauch, Jürgen von Hagen*
B13-01	**German Public Finances: Recent Experiences and Future Challenges**	*Jürgen von Hagen, Rolf R. Strauch*
B12-01	**The Impact of Eastern Enlargement On EU-Labour Markets. Pensions Reform Between Economic and Political Problems**	*Deutsch-Französisches Wirtschaftspolitisches Forum*
B11-01	**Inflationary Performance in a Monetary Union With Large Wage Setters**	*Lilia Cavallar*
B10-01	**Integration of the Baltic States into the EU and Institutions of Fiscal Convergence: A Critical Evaluation of Key Issues and Empirical Evidence**	*Ali M. Kutan, Niina Pautola-Mol*
B09-01	**Democracy in Transition Economies: Grease or Sand in the Wheels of Growth?**	*Jan Fidrmuc*
B08-01	**The Functioning of Economic Policy Coordination**	*Jürgen von Hagen, Susanne Mundschenk*
B07-01	**The Convergence of Monetary Policy Between Candidate Countries and the European Union**	*Josef C. Brada, Ali M. Kutan*
B06-01	**Opposites Attract: The Case of Greek and Turkish Financial Markets**	*Konstantinos Drakos, Ali M. Kutan*
B05-01	**Trade Rules and Global Governance: A Long Term Agenda. The Future of Banking.**	*Deutsch-Französisches Wirtschaftspolitisches Forum*
B04-01	**The Determination of Unemployment Benefits**	*Rafael di Tella, Robert J. MacCulloch*
B03-01	**Preferences Over Inflation and Unemployment: Evidence from Surveys of Happiness**	*Rafael di Tella, Robert J. MacCulloch, Andrew J. Oswald*
B02-01	**The Konstanz Seminar on Monetary Theory and Policy at Thirty**	*Michele Fratianni, Jürgen von Hagen*
B01-01	**Divided Boards: Partisanship Through Delegated Monetary Policy**	*Etienne Farvaque, Gael Lagadec*

2000

B20-00	**Breakin-up a Nation, From the Inside**	*Etienne Farvaque*
B19-00	**Income Dynamics and Stability in the Transition Process, general Reflections applied to the Czech Republic**	*Jens Hölscher*
B18-00	**Budget Processes: Theory and Experimental Evidence**	*Karl-Martin Ehrhart, Roy Gardner, Jürgen von Hagen, Claudia Keser*
B17-00	**Rückführung der Landwirtschaftspolitik in die Verantwortung der Mitgliedsstaaten? - Rechts- und Verfassungsfragen des Gemeinschaftsrechts**	*Martin Seidel*
B16-00	**The European Central Bank: Independence and Accountability**	*Christa Randzio-Plath, Tomasso Padoa-Schioppa*
B15-00	**Regional Risk Sharing and Redistribution in the German Federation**	*Jürgen von Hagen, Ralf Hepp*
B14-00	**Sources of Real Exchange Rate Fluctuations in Transition Economies: The Case of Poland and Hungary**	*Selahattin Dibooglu, Ali M. Kutan*
B13-00	**Back to the Future: The Growth Prospects of Transition Economies Reconsidered**	*Nauro F. Campos*

B12-00	**Rechtsetzung und Rechtsangleichung als Folge der Einheitlichen Europäischen Währung**	*Martin Seidel*
B11-00	**A Dynamic Approach to Inflation Targeting in Transition Economies**	*Lucjan T. Orlowski*
B10-00	**The Importance of Domestic Political Institutions: Why and How Belgium Qualified for EMU**	*Marc Hallerberg*
B09-00	**Rational Institutions Yield Hysteresis**	*Rafael Di Tella, Robert MacCulloch*
B08-00	**The Effectiveness of Self-Protection Policies for Safeguarding Emerging Market Economies from Crises**	*Kenneth Kletzer*
B07-00	**Financial Supervision and Policy Coordination in The EMU**	*Deutsch-Französisches Wirtschaftspolitisches Forum*
B06-00	**The Demand for Money in Austria**	*Bernd Hayo*
B05-00	**Liberalization, Democracy and Economic Performance during Transition**	*Jan Fidrmuc*
B04-00	**A New Political Culture in The EU - Democratic Accountability of the ECB**	*Christa Randzio-Plath*
B03-00	**Integration, Disintegration and Trade in Europe: Evolution of Trade Relations during the 1990's**	*Jarko Fidrmuc, Jan Fidrmuc*
B02-00	**Inflation Bias and Productivity Shocks in Transition Economies: The Case of the Czech Republic**	*Josef C. Barda, Arthur E. King, Ali M. Kutan*
B01-00	**Monetary Union and Fiscal Federalism**	*Kenneth Kletzer, Jürgen von Hagen*
1999		
B26-99	**Skills, Labour Costs, and Vertically Differentiated Industries: A General Equilibrium Analysis**	*Stefan Lutz, Alessandro Turrini*
B25-99	**Micro and Macro Determinants of Public Support for Market Reforms in Eastern Europe**	*Bernd Hayo*
B24-99	**What Makes a Revolution?**	*Robert MacCulloch*
B23-99	**Informal Family Insurance and the Design of the Welfare State**	*Rafael Di Tella, Robert MacCulloch*
B22-99	**Partisan Social Happiness**	*Rafael Di Tella, Robert MacCulloch*
B21-99	**The End of Moderate Inflation in Three Transition Economies?**	*Josef C. Brada, Ali M. Kutan*
B20-99	**Subnational Government Bailouts in Germany**	*Helmut Seitz*
B19-99	**The Evolution of Monetary Policy in Transition Economies**	*Ali M. Kutan, Josef C. Brada*
B18-99	**Why are Eastern Europe's Banks not failing when everybody else's are?**	*Christian E. Weller, Bernard Morzuch*
B17-99	**Stability of Monetary Unions: Lessons from the Break-Up of Czechoslovakia**	*Jan Fidrmuc, Julius Horvath and Jarko Fidrmuc*
B16-99	**Multinational Banks and Development Finance**	*Christian E.Weller and Mark J. Scher*
B15-99	**Financial Crises after Financial Liberalization: Exceptional Circumstances or Structural Weakness?**	*Christian E. Weller*
B14-99	**Industry Effects of Monetary Policy in Germany**	*Bernd Hayo and Birgit Uhlenbrock*
B13-99	**Fiancial Fragility or What Went Right and What Could Go Wrong in Central European Banking?**	*Christian E. Weller and Jürgen von Hagen*
B12 -99	**Size Distortions of Tests of the Null Hypothesis of Stationarity: Evidence and Implications for Applied Work**	*Mehmet Caner and Lutz Kilian*
B11-99	**Financial Supervision and Policy Coordination in the EMU**	*Deutsch-Französisches Wirtschaftspolitisches Forum*
B10-99	**Financial Liberalization, Multinational Banks and Credit Supply: The Case of Poland**	*Christian Weller*
B09-99	**Monetary Policy, Parameter Uncertainty and Optimal Learning**	*Volker Wieland*
B08-99	**The Connection between more Multinational Banks and less Real Credit in Transition Economies**	*Christian Weller*

B07-99	**Comovement and Catch-up in Productivity across Sectors: Evidence from the OECD**	*Christopher M. Cornwell and Jens-Uwe Wächter*
B06-99	**Productivity Convergence and Economic Growth: A Frontier Production Function Approach**	*Christopher M. Cornwell and Jens-Uwe Wächter*
B05-99	**Tumbling Giant: Germany's Experience with the Maastricht Fiscal Criteria**	*Jürgen von Hagen and Rolf Strauch*
B04-99	**The Finance-Investment Link in a Transition Economy: Evidence for Poland from Panel Data**	*Christian Weller*
B03-99	**The Macroeconomics of Happiness**	*Rafael Di Tella, Robert MacCulloch and Andrew J. Oswald*
B02-99	**The Consequences of Labour Market Flexibility: Panel Evidence Based on Survey Data**	*Rafael Di Tella and Robert MacCulloch*
B01-99	**The Excess Volatility of Foreign Exchange Rates: Statistical Puzzle or Theoretical Artifact?**	*Robert B.H. Hauswald*
1998		
B16-98	**Labour Market + Tax Policy in the EMU**	*Deutsch-Französisches Wirtschaftspolitisches Forum*
B15-98	**Can Taxing Foreign Competition Harm the Domestic Industry?**	*Stefan Lutz*
B14-98	**Free Trade and Arms Races: Some Thoughts Regarding EU-Russian Trade**	*Rafael Reuveny and John Maxwell*
B13-98	**Fiscal Policy and Intranational Risk-Sharing**	*Jürgen von Hagen*
B12-98	**Price Stability and Monetary Policy Effectiveness when Nominal Interest Rates are Bounded at Zero**	*Athanasios Orphanides and Volker Wieland*
B11A-98	**Die Bewertung der "dauerhaft tragbaren öffentlichen Finanzlage"der EU Mitgliedstaaten beim Übergang zur dritten Stufe der EWWU**	*Rolf Strauch*
B11-98	**Exchange Rate Regimes in the Transition Economies: Case Study of the Czech Republic: 1990-1997**	*Julius Horvath and Jiri Jonas*
B10-98	**Der Wettbewerb der Rechts- und politischen Systeme in der Europäischen Union**	*Martin Seidel*
B09-98	**U.S. Monetary Policy and Monetary Policy and the ESCB**	*Robert L. Hetzel*
B08-98	**Money-Output Granger Causality Revisited: An Empirical Analysis of EU Countries (überarbeitete Version zum Herunterladen)**	*Bernd Hayo*
B07-98	**Designing Voluntary Environmental Agreements in Europe: Some Lessons from the U.S. EPA's 33/50 Program**	*John W. Maxwell*
B06-98	**Monetary Union, Asymmetric Productivity Shocks and Fiscal Insurance: an Analytical Discussion of Welfare Issues**	*Kenneth Kletzer*
B05-98	**Estimating a European Demand for Money (überarbeitete Version zum Herunterladen)**	*Bernd Hayo*
B04-98	**The EMU's Exchange Rate Policy**	*Deutsch-Französisches Wirtschaftspolitisches Forum*
B03-98	**Central Bank Policy in a More Perfect Financial System**	*Jürgen von Hagen / Ingo Fender*
B02-98	**Trade with Low-Wage Countries and Wage Inequality**	*Jaleel Ahmad*
B01-98	**Budgeting Institutions for Aggregate Fiscal Discipline**	*Jürgen von Hagen*
1997		
B04-97	**Macroeconomic Stabilization with a Common Currency: Does European Monetary Unification Create a Need for Fiscal Insurance or Federalism?**	*Kenneth Kletzer*
B-03-97	**Liberalising European Markets for Energy and Telecommunications: Some Lessons from the US Electric Utility Industry**	*Tom Lyon / John Mayo*
B02-97	**Employment and EMU**	*Deutsch-Französisches Wirtschaftspolitisches Forum*
B01-97	**A Stability Pact for Europe**	*(a Forum organized by ZEI)*

ISSN 1436 - 6053

Zentrum für Europäische Integrationsforschung
Center for European Integration Studies
Rheinische Friedrich-Wilhelms-Universität Bonn

Walter-Flex-Strasse 3
D-53113 Bonn
Germany

Tel.: +49-228-73-1732
Fax: +49-228-73-1809
www.zei.de