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Analyses of the monetary policy of the System of European Central Banks

Back to the rules

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CONTENT

SUMMARY

Part 1

Rules for sound money

Under today's paper money standard, the political independency of central banks' monetary policies and the objective to keep inflation at a low and stable level are widely seen as proper guarantees for preserving the value of the currency. At the same time, however, "rule binding" of monetary policy action has been on the decline in recent years; "discretion" has been on the rise. As a result, the value of money increasingly depends on the "competence" of monetary policy makers. However, policy discretion will inevitably entail the risk of "human error". The hope that desired objectives can be met through deliberate and careful policy making by experts seems to increasingly outweigh concerns that the cost of policy errors under a system of discretion might become prohibitively high. We think that too little is known about the remoter effects of an ad hoc monetary policy that could support the latest trend towards returning to discretion in central banking. We therefore express concern that in particular money and credit expansion has been increasingly losing importance in putting limits to today's "state-of-the-art" monetary policy making.

Part 2

How the ECB and the US Fed set interest rates

Monetary policies of the ECB and US Fed can be described by "Taylor rules", that is both central banks seem to be setting rates by taking into account the "output gap" and inflation. (We also set up and tested Taylor rules which incorporate money growth and the change in the nominal exchange rate, thereby improving the "fit" between actual and Taylor rule based rates.) Taylor rules appear to be a much better way of describing Fed policy than ECB policy, though. The finding that Taylor rules "hold", however, is by no means a sign of a "good quality policy": it merely shows that both central banks seem to pursue a cyclical rather than medium- to long-term-oriented monetary policy (thereby becoming a potential source of economic disruptions); responding to, rather than preventing, target deviations seems to be the underlying rationale. Moreover, our simulations suggest that the ECB's short-term interest rates have been at a much lower level in the last two years compared with what a Taylor rule would suggest. This finding corresponds to our analysis that the bank's monetary policy stance is currently very expansionary indeed by all "standard measures".

Part 3

A call for publishing ECB Governing Council minutes

By publishing Governing Council meeting minutes, the ECB could improve the transparency and efficiency of its monetary policy substantially, thereby supporting its stability-oriented course for at least two reasons. First, publishing minutes should induce a positive disciplinary incentive for (i) improving the quality of the internal discussion among Council members and (ii) counteracting any inclination on the part of Council members to deviate from a

euro-wide oriented monetary policy. Second, minutes should help keeping a better balance of "influence power" between ECB Executive Board members and NCB presidents compared to the current status quo. The rationale for publishing minutes should increase in view of the foreseeable extension of the Governing Council due to the Eastward extension of the euro area and the envisaged reform of the Council's voting modalities. To be sure: ECB Governing Council meeting minutes shall not necessarily attribute names to individual statement made in Council meetings; they shall serve to explain the ECB Council's thinking, debate and decision to the outside world.

Part 4
ECB monetary policy and euro inflation outlook

The inflation outlook in the euro area has deteriorated compared to our May 2005 forecast. Monetary policy appears too expansionary according to all standard measures, especially so against the backdrop of the "energy price shock". We estimate that annual inflation in 2006 will be 2.5% on average (excluding "special factors") with little signs that inflation will fall back to below the ECB's 2% upper ceiling anytime soon. The ECB would thus be well advised to bring interest rates back towards a more "neutral level" which we think is in the neighbourhood of 3.5%. – Looking at the relation between money growth and inflation in the US, the euro area and Japan, money expansion and price rises appear, over the long-run, closely related. The more recent findings of an alleged "weakening" of this relation might be explained by "excess money" increasingly inflating asset rather than consumer prices. However, asset price inflation would certainly be no less detrimental to the purchasing power of money compared with "traditional" consumer price inflation – and therefore monetary policy should not disregard asset price inflation when setting rates, in our view. The growth rates of money should be interpreted as a valuable guide for monetary policy makers.

Zusammenfassung

Teil 1

Regeln für stabiles Geld

Die Institutionen, die den Erfolg des Papiergeldstandards garantieren sollen, sind die politische Unabhängigkeit der Zentralbank und die Zielvorgabe, die Inflation niedrig zu halten. Gleichzeitig hat in den letzten Jahren die „Regelbindung“ der Geldpolitik immer weiter zu Lasten diskretionären Handelns abgenommen. Damit hängt der Geldwert nun ganz entscheidend von der Handlungskompetenz/“Expertise“ der Zentralbanker ab. Die Diskretion der Geldpolitik birgt jedoch das Risiko menschlicher Fehler/Irrtümer. Die Hoffnung, dass ein vorgegebenes Inflationsziel durch wohlüberlegtes fallweises Handeln zu erreichen ist, scheint zunehmend die Sorge vor den (mitunter prohibitiv hohen) Kosten von Politikfehlern zu überlagern. Allerdings ist das Wissen über die (weiter in die Zukunft reichenden) Folgen eines ad hoc Handelns zu gering, als dass eine Rückkehr zu einer diskretionären Geldpolitik zu rechtfertigen wäre. Insbesondere muss besorgt stimmen, dass der Geld- und Kreditmengenexpansion immer weniger Bedeutung zugewiesen wird, wenn es darum geht, die Grenzen der Zinspolitiken der Notenbanken zu bestimmen.

Teil 2

Zinssetzungsverhalten der EZB und der US Fed

Die Zinspolitiken der EZB und der US Fed können recht gut anhand von „Taylor-Regeln“ beschrieben werden, d. h. beide Zentralbanken reagieren auf die „Outputlücke“ und die laufende Inflation. Wir haben ebenfalls Taylor-Regeln spezifiziert und getestet, die das Geldmengenwachstum und den effektiven Wechselkurs berücksichtigen; sie verbessern den „Fit“ zwischen aktuellem und theoretischem Taylorzins. Taylor-Regeln erklären dabei das Zinssetzungsverhalten der Fed generell besser als das der EZB. Der Befund, dass die Taylor-Regeln „halten“, ist jedoch keinesfalls ein Gütezeichen für die Geldpolitiken. Er zeigt vielmehr, dass die Notenbank recht zyklisch und damit weniger mittel- bis langfristorientiert die Zinsen setzen – und möglicherweise dadurch selbst Quelle für Störungen im Wirtschaftsablauf werden. Eher auf Zielabweichungen zu reagieren, als sie vorausschauend zu vermeiden, scheint das unterliegende Geldpolitik-Verhalten zu charakterisieren. Unsere Simulationen deuten an, dass der EZB-Zins in den letzten zwei Jahren deutlich niedriger gewesen ist, als es die Taylor-Regel nahe legen würde. Dieser Befund unterstreicht unsere (bisherigen) Analyseergebnisse, dass nämlich die EZB-Geldpolitik nach wie vor zu expansiv ist.

Teil 3

EZB sollte Sitzungsprotokolle veröffentlichen

Die Pressemitteilung der EZB erlaubt es Außenstehenden nicht, sich ein angemessenes Bild über die geldpolitische Debatte im Rat zu verschaffen. Die EZB könnte die Transparenz ihrer Politik substantiell erhöhen, wenn sie Sitzungsprotokolle – etwa nach dem Muster der US Fed und der Bank of England – veröffentlichen würde. Dies würde die stabilitätsorientierte Politik der Bank unterstützen. Zum einen würde die Veröffentlichung von Sitzungspro-

tokollen die Ratsmitglieder disziplinieren, die Qualität der geldpolitischen Diskussion ständig weiter zu erhöhen, und sie würde die Neigungen einzelner Mitglieder entgegenwirken, von der „Euroraum-weiten" Betrachtung in nationales Denken und Entscheiden abzuweichen. Zum anderen dürfte das Veröffentlichen von Sitzungsprotokollen – verglichen mit den Status quo – zu einer besseren "Balance der Einflussmacht" zwischen EZB-Direktorium und den nationalen Notenbankpräsidenten verhelfen. Die Ratio für das Veröffentlichen von Sitzungsprotokollen steigt weiter an angesichts der Erweiterung des EZB-Rates im Zuge der anstehenden Osterweiterung des Währungsraums. Es sei betont: Sitzungsprotokolle müssen nicht notwendigerweise die Diskussionsbeiträge der Ratsmitglieder preisgeben; sie sollen die Öffentlichkeit aber über Inhalt, Debatte und Entscheidung der Geldpolitik EZB-Rat informieren.

Teil 4
EZB-Geldpolitik und Inflationsausblick

Der Inflationsausblick im Euroraum hat sich gegenüber der Schätzung im Mai 2005 verschlechtert. Gemäß allen „Standardmaßen" erscheint die Geldpolitik der EZB zu expansiv, insbesondere vor dem Hintergrund des „Energiepreisschocks". Wir schätzen, dass die jahresdurchschnittliche Inflation in 2006 auf 2,5% ansteigt (ohne Berücksichtigung von „Spezialfaktoren"). Es ist derzeit nicht abzusehen, dass die Inflation wieder unter die 2-Prozentmarke fällt. Die EZB sollte daher den Notenbankzins schrittweise auf ein „neutrales" Niveau, das wir auf etwa 3,5% beziffern, anheben. – Eine Betrachtung der Beziehung zwischen Geldmengenwachstum und Inflation in den USA, dem Euroraum und Japan zeigt über die lange Frist einen rechten engen Zusammenhang beider Größen. Die jüngsten Befunde, dass sich diese Beziehung gelockert zu haben scheint, könnten damit begründet werden, dass die „Überschussgeldmengen" aktuell weniger die Konsumentenpreise in die Höhe treiben als vielmehr die Preise für Bestandsvermögen. Eine „Asset Price Inflation" wäre jedoch genauso schädlich für die Kaufkraft des Geldes wie die „traditionelle" Konsumentenpreisinflation. Die Notenbanken sollten daher Asset Price Inflation bei ihrer Geldpolitik berücksichtigen. Die Wachstumsraten der Geldmengen dürften dabei helfen, die richtige Zinspolitik zu verfolgen.

Part 1
Rules for sound money

CONTENT: *1.1 The debate about "rules versus discretion". – 1.2 Today's monetary policy set-up. – 1.3 "Limited knowledge" in monetary policy.*

SUMMARY: *Under today's paper money standard, monetary policies' political independency and the objective to keep inflation at a low and stable level are widely seen as proper guarantees for preserving the value of the currency. At the same time, however, "rule binding" of monetary policy action has been on the decline in recent years; "discretion" has been on the rise. As a result, the value of money increasingly depends on the "competence" of monetary policy makers. However, policy discretion will inevitably entail the risk of "human error". The hope that desired objectives can be met through deliberate and careful policy making by experts seems to increasingly outweigh concerns that the cost of policy errors under a system of discretion might become prohibitively high. We think that too little is known about the remoter effects of an ad hoc monetary policy that could support the latest trend towards returning to discretion in central banking. We therefore express concern that in particular money and credit expansion has been increasingly losing importance in putting limits to today's "state-of-the-art" monetary policy making.*

> "(…) the aversion to general principles, and the preference for proceeding from particular instance to particular instance, is the product of the movement which with the "inevitability of gradualness" leads us back from a social order resting on the general recognition of certain principles to a system in which order is created by direct command."
> — *Hayek, F. A. von (1945), Individualism: True and False.*

1.1 The debate about "rules versus discretion"

The debate about "rules versus discretion" for monetary policy has quite a long history in economic thinking.[2] Essentially, the discussion is about this: Shall monetary policy be allowed to take virtually any action deemed proper under prevailing conditions or shall it be forced to follow a (strict) rule? The latter could be operationalized by, for instance, Milton Friedman's *k*-percent rule, that is the central bank should expand the stock of money by a constant growth rate over time. Alternatively, monetary policy could be required to set interest rates in line with a flexible, or feedback (or open loop) rule.

The debate might be an old one, but it is all the more important in a fully-fledged government controlled paper money standard. As Milton Friedman put it: "(…) the world is now engaged in a great experiment to see whether it can fashion a different anchor, one that depends on

[2] For a classic statement see *Simons, H. C.* (1948), Rules versus Authorities in Monetary Policy, Economic Policy for a Free Society, Chicago, pp. 40 – 77; also *Shaw, E. S.* (1958), Money Supply and Stable Economic Growth, in: United States Monetary Policy, New York, pp. 49 – 71.

government restraint rather than on the costs of acquiring a physical commodity."[3] Irving Fisher, evaluating past experience, wrote on the same issue: "Irredeemable paper money has almost invariably proved a curse to the country employing it."[4] In the following, we will provide a snapshot of the debate about rules versus discretion for monetary policy and, against this background, take a closer look at where international monetary policy stands and what challenges lie ahead when it comes to preserve sound money.

■ Arguments for discretion

The first argument in favour of relying upon discretion is that room for manoeuvring on the part of the central bank may be used wisely to meet needs as they develop. No two sets of economic conditions are identical; the future is uncertain. So how can central bankers, with all their limitations as human beings, set a general rule for the future which will serve as well as the best that men can do as conditions develop? Not enough is known about the ability of officials to implement a rule, almost any rule, to be confident of success. Can one not get the best total and combination of change if we deliberately make the monetary system adaptable?

Discretionary policy action tends to be held in high esteem because it is believed that monetary policy can contribute most when it is framed and administered in the light of conditions as the appear. To put it differently: monetary policy, or a change in money supply, is seen as the appropriate instrument to counteract recession, a view closely related to the viewpoint of Keynesian Economics.

Second, a fixed rule would "fix into stone" the policy objective. However, society may find it desirable to change monetary policy goals over time. And a policy fixed to a rule may well be suited to achieving one goal (such as price stability), but it may be poorly adapted for reaching another (economic growth), which may nevertheless increase in relative importance over time.

For instance, insulation from troubles coming from other countries may make necessary flexibility in monetary policy, it is said, for preventing foreign "shocks" (such as, for instance, financial crises etc.) from spilling over into the domestic economy, causing output and employment losses.

Third, the great majority of those who have made policy, and in particular of those who are authorised to execute it, tend to prefer a considerable degree of discretion. Indeed, from an individual point of view, being responsible for taking decisions on a discretionary basis can be expected to be much more rewarding (in terms of prestige and "job

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3 *Friedman, M.* (1994), *Money Mischief*, San Diego et al., p. 42.

4 *Fisher, I.* (1929), *The Purchasing Power of Money*, New York, Macmillan, 1911, 2nd ed., New York, Macmillan, 1913, New ed., New York: Macmillan 1929, p. 131.

satisfaction") compared with implementing a policy slavishly following a strict rule ("auto pilot").

■ Arguments for rules

The first important reason for adhering to a (strict) rule is that, to start with, it assures protection against *human error*. Even if the rule may not be best for every situation, there is no danger of bad selection of alternative action or bad timing as authorities try to meet changing conditions. Thus, the public avoids not only the costs of uncertainty regarding policy action (in terms of timing and magnitude) but also some of the risks related to poor policy. At the worst, much may be sacrificed to obtain little because the potential superiority of flexible over fixed policy will not be large, whereas the losses from shifting to an inappropriate policy can be substantial.

Second, the selection of a fixed rule, once put in place, would require careful analysis and extensive public discussion. Though the final definition of policy would not be perfect, it would doubtless represent more carefully, and certainly more widely, considered thought than would be various decisions of an authority having extensive discretion to change policy at all times. The rule could represent the general public interest, whereas specific use of authority might be subject to pressure exerted by those concerned more with special than with general interest.

And third, experience may recommend that adhering to rules may simply be better than relying on discretion when it comes to preserving price stability. The record of discretionary management has by no means been brilliant. Perhaps it has not even been good. Judging the record is difficult, of course, if only because one cannot know what different actions would have produced. Nevertheless, the accomplishment certainly does not in itself provide convincing testimonial to the superiority of authority over rule.

■ The new discussion: "time inconsistency"

The "old" debate about "rules versus discretion" got a new impetus through the issue of "time-inconsistency" as addressed by Kydland and Prescott (1977).[5] To see how time-inconsistency could lead to excessively high inflation, suppose that the central bank has the twin goals of

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[5] See *Kydland, F., Prescott, E.* (1977), Rules Rather than Discretion: The Inconsistency of Optimal Plans, in: Journal of Political Economy 87, pp. 473 – 492. The earlier literature focused on time inconsistency leading to the well-known inflation bias and on means of overcoming policy imperfections. More recently, time inconsistency issues have attracted renewed attention due to the large influence of the New Keynesian theoretical framework. See *Clarida, R. Gali, J., Gertler, M.* (1999), The Science of Monetary Policy: A New Keynesian Perspective, in: Journal of Economic Literature, 37 (4), pp. 1661 – 1707.

keeping inflation close to some target level and unemployment close to the "natural rate".[6]

Now suppose that there are market imperfections, such as monopolistic competition or union behavior, or distortions caused by fiscal policy, so that the unemployment rate that clears the labor market is inefficiently high, lying above the natural rate. To keep unemployment close to the natural rate, the central bank must try to lower unemployment below the inefficiently high rate that ordinarily clears the labor market. In this model, workers negotiate their wage rate with firms based on what they expect inflation to be. To the extent that workers correctly anticipate inflation, the prevailing unemployment rate is the (inefficiently high) market clearing rate.

Kydland and Prescott showed in their model that the central bank's desire to reduce unemployment to the natural rate leads to time-inconsistent behavior. Suppose that the inflation target is 2% p.a.; the optimal monetary policy recognizes that workers cannot be systematically fooled and, consequently, that the unemployment rate cannot systematically depart from the market-clearing rate. Despite its twin goals, therefore, the best the central bank can do is announce that it will set monetary policy such that inflation equals 2%, and then follow through on that announcement and let the labor market clear at the market-clearing level.

But this optimal policy is time-inconsistent and will not be realised, despite its pre-announcement. If workers believe the central bank's policy announcement and negotiate a contract with firms providing for a 2% nominal wage increase, then the central bank's range of options changes. Instead of following through and implementing the announced policy, the central bank can create a little more inflation ("inflation surprise"), which lowers workers' real wages, stimulating firms' demand for labor. With the nominal wage rate fixed, the labor market now clears at a lower unemployment rate. Thus, at the cost of slightly higher inflation, the economy reaps the benefit of lower unemployment. Kydland and Prescott showed that, in balancing these costs and benefits, the central bank would find it advantageous to create the inflation surprise and not implement the announced policy.

Of course, workers soon will realize that the central bank's announcements are not credible, and they will come to expect higher inflation. And when workers expect higher inflation, it becomes increasingly costly for the central bank to create an inflation surprise. The equilibrium outcome is for inflation to rise to the point where the central bank finds that the benefits of any additional inflation surprises are fully offset by their costs. At this inflation, the central bank has no in-

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[6] See in this context, for instance, *Dennis, R.* (2003), Time-Inconsistency in Monetary Policies: Recent Research, in: FRBSF Economic Letter, No. 2003-10, April 11.

centive to create an inflation surprise. But because there are no inflation surprises, workers fully anticipate inflation, and the labor market does not clear at the natural rate of unemployment: instead the higher market-clearing rate prevails. Sadly, the fact that the central bank can revisit its announced policy after wages are set leaves the economy with inefficiently high inflation, but no reduction in the unemployment rate. The discrepancy between average inflation that occurs and the inflation target is known as the "discretionary inflation bias".

■ The current stand of the debate

In the debate "rules versus discretion", the classical arguments of the proponents of rules – namely "limited knowledge" on the part of policy makers and central banks disregarding peoples' preferences (that is a preference for sound money) – seem to have lost their power. However, even if it is assumed that central banks are knowledgeable and benevolent it can be shown that relying on rules would yield better results than following a policy of discretion.

To show this, we make use of a rather simple model (Alesina (1988)).[7] The supply function is:[8]

(1) $y_t = p_t - w_t + e_t$,

where y is output, p is the change in the price level (inflation); w the change in nominal wages and e is the i.i.d. "white noise" error term with the variance σ_t^2. Nominal wages shall be fixed at the beginning of the period and are thus irresponsive to changes in p and e in the period under review. Disregarding productivity growth and assuming that market agents have "rational expectations", nominal wages are:

(2) $w_t = E(p_t / I_{t-1}) = p_t^*$,

where E is the expectation operator, I_{t-1} is the information set in t-1 and p_t^* is the expected inflation.

Furthermore, assume that the central bank's social cost function is

(3) $L = \left[\frac{1}{2} p_t^2 + \frac{b}{2} (y_t - k)^2 \right]$,

with k (natural output) > 0 and b > 0. Following Barro and Gordon (1983)[9], the central bank can determine inflation, taking into account w and e. The first derivation of equation (3) with respect to p yields:

(4) $p_t^{Dis} = bk - \frac{b}{1+b} e_t$,

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[7] See also *Kösters, W.* (1989), Erfahrungen mit Geldmengenzielen und ihre Implikationen für die konzeptionelle Ausgestaltung der Geldpolitik, in: Wirtschaftswachstum, Strukturwandel und dynamischer Wettbewerb, Festschrift für *E. Helmstädter*, *Gahlen, B.* et al. (ed), Berlin et. al., pp. 107 – 123.

[8] For simplicity, the coefficients and the constant are set to one.

[9] See *Barro, R. J., Gordon, D. B.* (1989), Rules, Discretion and Reputation in a Model of Monetary Policy, in: Journal of Monetary Economics, Vol. 12, pp. 101 – 122.

that is inflation under a discretionary (*Dis*) monetary policy. Adhering to a fixed rule (*FR*), however, inflation would be:

(5) $p_t^{FR} = \frac{b}{1+b} e_t$.

That said, a rule based policy would yield a lower inflation compared to discretion:

$p_t^{Dis} > p_t^{FR}$.

How well would a fixed rule (*Fix*) – such Friedman's *k*-percent rule – perform vis-à-vis a flexible rule? In the Alesina-model, a fixed rule would imply:

(6) $p_t^{Fix} = 0$.

However, it can be shown that in the model considered here the social costs of a flexible rule could be lower than those of a fixed rule, so that:

(7) $L^{FR} < L^{Dis}$ and $L^{FR} < L^{Fix}$.

That said, a discrectionary policy would dominate a fixed rule if, and only if, the following condition holds:

(8) $k^2(1+b)^2 = \sigma_e^2$.

The latter would be the case if the variance of the supply-side shock is high and/or the target output level (*k*) is low (that is relatively close to potential output) and having a rather little weight (*b*) in the central bank's objective function.

The Alesina model provides the following insight: A discretionary monetary policy cannot be a "*first best solution*" because – at least theoretically – there is a superior flexible rule which fulfils equation (7). A discretionary policy is therefore a "*second best*" – and would only be preferable if a flexible rule would not be available. However, these results would need further analyses in view of two issues: dynamic time-inconsistency and efficient control of central banking (Kösters (1989), pp. 113)).

Indeed, there is theoretical evidence that so-called "flexible feedback rules would "outperform" discretion and fixed-rule based monetary policy, making them "*first best*". However, such a monetary policy rule would tend to become rather complex and entail a rather low degree of transparency. Most importantly, for making flexible rules a first best solution the public would have to be in a situation to be able to impose, if necessary, sanctions on the central bank (Kösters (1989), p. 119). Whereas this might be a plausible outcome in theory, it would be a rather unrealistic result in practise.

What is the lesson to be learned from time-inconsistency problem for a government controlled paper money standard? The answer appears to be rather straightforward: The central bank's price stability promise must be credible from the point of view of market agents. This, in turn, would require that there are no (economic) incentives for monetary policy which might induce decision makers to deviate from

their (ex ante) announced objective – either deliberately breaking promises ("*fraud*") or by making policy mistakes ("*policy errors*").

There are various ways of trying to solve the "inflation bias". Following Barro and Gordon (1983)[10], the marginal costs of inflation as perceived by the central bank could be increased. For instance, it must be secured that succumbing to inflate today would worsens the central bank's reputation for delivering low inflation in the future, which, in turn, shall lower the expected value of the central bank's objective function (reputation in "repeated games").

Alternatively, one could reduce the inflation bias by nominating a policy maker who places a larger than normal weight on inflation fighting and then give the individual(s) the independence of conducing monetary policy (a so-called "conservative central banker" solution).[11] Also, one might think of structuring the policy maker's compensation package in a way that raises the marginal cost of inflation.

In view of the time inconsistency problem and the possible solutions discussed in the literature, how does today's monetary policy live up to these challenges when it comes to meeting the challenge of preserving the value of the currency?

1.2 Today's monetary policy set-up

It is fair to say that in virtually all western industrial countries the discussion about the time inconsistency problem has not been lost upon designing of monetary policies. The objective of preventing the time-inconsistency problem has shaped the institutional framework of monetary policy. More specifically, "modern day's" recipe for preserving the purchasing power of paper money rests on the following pillars:

— *Political independence*: Central banks have been granted political (and in most cases also financial and instrumental) independency. By doing so, governments, driven by day-to-day considerations, are prevented from taking recourse to the printing press to increase money supply in an effort to prompt short-term growth and employment gains, only to be followed by (substantial) inflationary costs in later periods.

— *Price stability mandate*: In most countries, central banks have been assigned with the explicit mandate – in many cases enshrined in

[10] See *Barro, R. J., Gordon, D. B.* (1983), A Positive Theory of Monetary Policy in a Natural Rate Model, in: Journal of Political Economy, Vol. 91, No. 4, pp. 589 – 610.

[11] See *Rogoff, K.* (1985), The Optimal Degree of Commitment to an Intermediate Monetary Target, in: Quarterly Journal of Economics, Vo. 100, No. 4, pp. 1169 – 1189; also *Persson, T., Tabelline, G.* (1990), Macroeconomic Policy, Credibility and Politics, Fundamentals of Pure and Applied Economics, Chur: Harwood Academic Publishers, p. 26.

countries' constitutions – of preserving the purchasing power of money. Also, central banks tend to inform the public at large (via public speeches given by policy decision makers, regular publications, etc.) about the costs and benefits of inflation, thereby trying to establish a "stability consensus", which should help monetary policy to pursue a stability-oriented course.[12]

— *Limits to government debt:* Various countries have taken measures to prevent government debt from spinning out of control, a development which could easily provoke public pressure on the central bank to reduce the real public debt via inflation. Take, for instance, the European Stability and Growth Pact (Pact). The underlying idea of the Pact is that the smaller the government debt burden is, the smaller is the danger that the currency will be debased and, as a result, the more credible is the stability promise given by the central bank.

— *"Hands tying"*: Some central banks have explicitly announced a monetary policy strategy, which shall improve the predictability and transparency of monetary policy making to the outside world. This, in turn, shall increase the accountability of central bank actions and thereby increase confidence that the central bank will deliver on its promise.

Broadly speaking, the current institutional set-up of monetary policy in most countries is based on the experience that (i) ongoing government meddling in monetary matters is "too costly" and (ii) the time-inconsistency problem – as highlighted by Kydland and Prescott – must be avoided when the objective is to preserve sound money. That said, the essential idea of today's framework for preserving the value of paper money is preventing government fraud.

Progress made has been impressive. At the same, however, this effort has been accompanied by an increase in discretionary scope of central bankers. To put if differently: concerns have been declining that (unintended) human error on the part of central banks could pose an increasing threat to the ideal of sound money.

An actual return to "monetary policy without rule" began in the early 1990s, when various central banks abandoned monetary aggregates as a major guide post for setting interest rates. It was argued that demand for money had become an unstable indicator in the "short term" and that, as such, money could no longer be used as a yardstick in setting monetary policy, particularly so as policy makers were making interest rate decisions every few weeks. However, that guide post has not been replaced with anything since then.

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[12] A good example is the European Central Bank, which right from the start took great effort rationalizing its monetary policy. See, for instance, The stability-oriented monetary policy strategy of the Eurosystem, in: ECB Monthly Bulletin, January 1999, pp. 39 – 50.

Still, low and stable inflation serves as the primary policy objective for most central banks. However, is that (alone) a sufficient condition to become successful in the long-run? What about human error?

What guides monetary policies?

US Federal Reserve (Fed)

The Full Employment and Balanced Growth Act of 1978, known as the Humphrey-Hawkins Act, required the Fed to set one-year target ranges for money supply growth twice a year and to report the targets to Congress. During the heyday of the monetary aggregates, in the early 1980s, analysts paid a great deal of attention to the Fed's weekly money supply reports, and especially to the reports on M1. If, for example, the Fed released a higher-than-expected M1 figure, the markets surmised that the Fed would soon try to curb money supply growth to bring it back to its target, possibly increasing short-term interest rates in the process.

Following the introduction of NOW accounts nationally in 1981, however, the relationship between M1 growth and measures of economic activity, such as GDP, broke down. Depositors moved funds from savings accounts—which are included in M2 but not in M1—into NOW accounts, which are part of M1. As a result, M1 growth exceeded the Fed's target range in 1982, even though the economy experienced its worst recession in decades. The Fed de-emphasized M1 as a guide for monetary policy in late 1982, and it stopped announcing growth ranges for M1 in 1987.

By the early 1990s, the relationship between M2 growth and the performance of the economy also had weakened. Interest rates were at the lowest levels in more than three decades, prompting some savers to move funds out of the savings and time deposits that are part of M2 into stock and bond mutual funds, which are not included in any of the money supply measures. Thus, in July 1993, when the economy had been growing for more than two years, Fed Chairman Alan Greenspan remarked in Congressional testimony that "if the historical relationships between M2 and nominal income had remained intact, the behavior of M2 in recent years would have been consistent with an economy in severe contraction." Chairman Greenspan added, "The historical relationships between money and income, and between money and the price level have largely broken down, depriving the aggregates of much of their usefulness as guides to policy. At least for the time being, M2 has been downgraded as a reliable indicator of financial conditions in the economy, and no single variable has yet been identified to take its place."

In 2000, when the Humphrey-Hawkins legislation requiring the Fed to set target ranges for money supply growth expired, the Fed announced that it was no longer setting such targets, because money supply growth does not provide a useful benchmark for the conduct of monetary policy. However, the Fed said, too, that "(…) the FOMC believes that the behavior of money and credit will continue to have value for gauging economic and financial conditions."

As of today, there should be little doubt that the Fed is de facto pursuing a rather discretionary monetary policy when it comes to taking policy action. To the outside world, it is neither known which variables are (systematically) taken into account by the Fed nor which weight is assigned to the specific variables under review. Of course, the Fed provides a pretty good insight into what has been discussed in its FOMC meetings via publishing minutes. However, this should not obscure the fact that the Fed decision making body appears to be relying purely on its "expertise" of how to interpret data properly when it comes to drawing conclusion about future inflation, growth and employment.

European Central Bank

Following its strategy revision of 8 May 2003, the ECB announced that it would continue to base its monetary policy decisions on an economic and monetary

analysis: "It thereby retains the two-pillar approach to the organisation, assessment and cross-checking of policy-relevant information."[13] Most importantly, however, the revision led de facto to a "(ex)change in pillars". Following the strategy revision, the monetary analysis (former "first pillar" of the strategy) has been downgraded to become a "cross-checking" tool, it shall put into perspective the results of the economic analysis (the former "second pillar"): "In particular, [the ECB] indicated that monetary analysis mainly serves as a means of cross-checking, from a medium to long-term perspective, the short to medium-term indications coming from economic analysis."[14]

The ECB rationalises its decision with the different timing real economic and monetary factors affect inflation: "An important argument in favour of adopting the two-pillar approach relates to the difference in the time perspectives for analysing price developments. The inflation process can be broadly decomposed into two components, one associated with the interplay between demand and supply factors at a high frequency, and the other connected to more drawn-out and persistent trends. (…) The latter component is empirically closely associated with the medium-term trend growth of money."[15]

That said, the information of the monetary analysis does no longer serve as the main guidance of monetary policy. However, one may say that the outcome of the strategy review seems to have made little difference: since its inception in January 1999, the ECB appears to have decided on rates in a rather discretionary way, paying little attention to the signals provided by monetary aggregates (even over long-term periods). This is not to say that the bank would not pay attention to monetary analysis as such. On the contrary. But the fact is that ECB decision makers appear to rely on their own judgement rather than following the indications given by monetary data. In other words: the ECB, quite similar to the US Fed, appears to pursue a rather discretionary monetary policy. The difference being that the bank's explicitly announced monetary policy requires the ECB Governing Council to bring its argumentation in line with the strategy.

Swiss National Bank

After 25 years of monetary targeting, the Swiss National Bank (SNB) adopted a new monetary policy framework at the end of 1999.[16] Severe shocks to the demand for central bank money, especially for large denominated bank notes and for reserves held by commercial banks at the SNB, rendered it impossible to use the medium-term target path for the seasonally adjusted monetary base as a guideline for monetary decisions. Since also the demand for the broader money aggregate suffered from an insufficient stability, the SNB decided to abandon monetary targeting.

The new framework consists of three elements. The first element is an explicit definition of price stability. The SNB regards price stability as achieved if CPI inflation is below 2 percent. The second element consists of the use of an inflation forecast as the main indicator to guide monetary policy decisions. The third element is a target range for the 3-month Libor as an operational target to implement monetary policy. Money aggregates continue to be important, but they are used as information variable rather than as intermediate targets. As in the old concept, maintaining price stability over the medium term remains the main objective of monetary policy also in the new framework.

The SNB strategy shares some elements with inflation targeting. However, it also differs from it in some important respects. The strategy has no inflation target. Rather,

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13 ECB (2003), The outcome of the ECB's evaluation of its monetary policy strategy, Monthly Bulletin, June, p. 79.

14 *Ibid*, p. 87.

15 *Ibid.*

16 See, for instance, *Kugler, P. et al* (2004), Measurement errors in GDP and forward-looking monetary policy, Deutsche Bundesbank Discussion Paper, No. 31.

the SNB's concept knows a definition of price stability. The SNB has no obligation to keep inflation under all circumstances and all costs in the range of price stability. Also, the time horizon to bring inflation back in the range of price stability after an inflationary shock is not pre-specified. The SNB analyses each situation individually and decides depending on the current economic conditions. Contrary to countries pursuing an inflation targeting strategy, the SNB has great independence regarding the exact definition of price stability and the policy reaction if inflation is outside the objective.

In view of the above, the SNB's inflation target plays the crucial role in the bank's monetary policy. The inflation forecast, in turn, is an internally calculated variable. Of course, there are papers available trying to shed light on how the SNB inflation forecasts are being put together. At the end of the day, however, there should be little doubt that the SNB has increased its room for pursuing a discretionary monetary policy substantially by making use of inflation forecasts at the expense of following the guidance of monetary aggregates.

1.3 The issue of "limited knowledge"

Two institutional factors – political independency and the mandate to preserve the purchasing power of money – are widely seen as proper guarantees for preserving the value of government controlled paper money.

At the same time, central banks' room for discretionary monetary policy has increased substantially in the last years: monetary policy action has been increasingly limited by prescribing goals rather than specific actions, or rules. That said, the success of today's paper money depends – presumably more than ever – on the "competence" of monetary policy makers; or: the confidence that they will take the right decision at the right time.

A crucial consideration seems to have been on the decline of late, though: namely that discretion might necessarily entail *human error* and that the greater the degree of discretion used, the greater the severity of potential error. The hope that desired objectives can be met through deliberate and careful policy making by experts clearly seems to be outweighing concerns that the cost of policy mistakes under a system of unfettered money supply might become prohibitively high.

Central banks appear to have become rather optimistic, maybe even euphoric, as far as their competence is concerned. For instance, asked bout the major lesson to be learned from the Greenspan years, Alan Blinder, former vice chairman of the Fed and professor at Princeton University, responded: "[Mr Greenspan's] flexibility, his unwillingness to get stuck in a doctrinal straitjacket that becomes dysfunctional may be his greatest strengths."[17] In the same vein, Fed Governor Ben S. Bernanke said: "Is there then no middle ground for policymakers between the inflexibility of ironclad rules and the instability of unfettered discretion? My thesis today is that there is such a middle

[17] In fact, full discretion is now being widely held in high esteem. (*Andrews, E.* (2005), Fed's challenges as Greenspan era draws to a close, International Herald Tribune, 24-25 September, p. 14.)

ground – an approach that I will refer to as *constrained discretion* – and that it is fast becoming the standard approach to monetary policy around the world (…)."[18]

To be sure: the danger inherent to the manner in which paper money supply is being handled today does not necessarily stem from "bad intentions". It is the very issue of limited knowledge or, as Hayek would probably have put it, it is the "*pretence of knowledge*" (1974) that warrants attention.[19]

Whereas the objective to preserve the value of government controlled paper money appears to be a laudable one, the truth is that it should be rather difficult to deliver on such a promise under a discretionary monetary policy. In fact, all too often there tend to be overwhelming political-economic incentives for a society to increase its money and credit supply, if possible, in order to influence societal developments according to ideological pre-set designs rather than relying on free market principles.

Central banks are unlikely to withstand such demands if they do not have any "anchoring" – that is a (fixed) rule which restrains the increase in money and credit supply in day-to-day operations; an inflation target might not necessarily qualify as a rule, given the uncertain and long time lags in monetary policy. In the absence of such a limit, central banks, confronted with, for instance, a severe economic crisis, are most likely to be forced to trade off the growth and employment objective against the preserving the value of money – thereby compromising a crucial pillar of the free society.

In view of the return of discretion in monetary policy, it might be insightful to quote Hayek's concern, namely that: "(...) [inflation] is the inevitable result of a policy which regards all the other decisions as data to which the supply of money must be adapted so that the damage done by other measures will be as little noticed as possible." In the long run, such a policy would cause central banks to become "the captives of their own decisions, when others force them to adopt measures that they know to be harmful."[20]

The considerations above appear to be all the more important given that it may be monetary policy itself that is the cause for economic disruption. In fact, rather little is known about what an unfettered paper money standard might do to a free market system. Admittedly, it is well known that inflation emerges if too much money is chasing too few goods, and that inflation is negative for growth and employment.

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18 *Bernanke, B. S.* (2003), "Constrained Discretion" and Monetary Policy, remarks Before the Money Marketeers of New York University, New York, New York, February 3.

19 *Hayek, F. A. von* (1974), The Pretense of Knowledge, Nobel Price Lecture, 11 December.

20 *Hayek, F. A. von* (1960), The Constitution of Liberty, Chicago, p. 333.

However, are policy makers fully informed what ad hoc actions might do to future societal conditions and, as a direct result thereof, what central banks will be required to do in the future?

Against this backdrop, it seems worth while to quote Ludwig von Mises: "No very deep knowledge of economic is usually needed for grasping the immediate effects of a measure; but the task of economics is to foretell the remoter effects, and so to allow us to avoid such acts as attempts to remedy a present ill by sowing the seeds of a much greater ill for the future."[21]

Indeed, too little is known about the remoter effects of an ad hoc monetary policy which could support the unrestrained return to discretion in central banking. It seems that the low consumer price inflation environment, following a period of disinflation until around the middle of the 1990s, has encouraged monetary policy makers to think that their actions contribute most when it is framed and administered in the light of conditions as they develop. This intellectual inclination has been accompanied by declining concerns about the severity of policy mistakes/errors.

The record of discretionary management has by no means been brilliant, though. Judging the record is difficult, of course, if only because one cannot know what different solutions would have been produced. Nevertheless, the accomplishment certainly does not in itself provide a convincing testimonial to the superiority of discretion over rule – as seems to have become the wisdom of the day. One should therefore express concern about the fact that in particular money and credit expansion has been increasingly losing importance in today's "state-of-the-art" monetary policy making.

[21] *Mises, L. von* (1912), The Theory of Money and Credit, Indianapolis, p. 23.

Part 2
How the ECB and the US Fed set interest rates

CONTENT: *2.1 Reaction function of monetary policy. – 2.2 Theory and empirical evidence of the Taylor rule. – 2.3 Concluding remarks.*

SUMMARY: *Monetary policies of the ECB and US Fed can be characterised by "Taylor rules", that is both central banks seem to be setting rates by taking into account the "output gap" and inflation. We also set up and tested Taylor rules which incorporate money growth and the effective exchange rate, thereby improving the "fit" between actual and Taylor rule based rates. In general, Taylor rules appear to be a much better way of describing Fed policy than ECB policy. The finding that Taylor rules "hold", however, is by no means a sign of a "good quality policy": it merely shows that both central banks seem to pursue a cyclical rather than medium- to long-term oriented monetary policy (thereby becoming a potential source of economic disruptions); responding to rather than preventing target deviations seems to be the underlying rationale. Moreover, our simulations suggest that the ECB's short-term interest rates have been at a much lower level in the last two years compared with what a Taylor rule would suggest. This finding corresponds to our analysis that the bank's monetary policy stance is currently very expansionary indeed by all "standard measures".*

> "But in the social field the erroneous belief that the exercise of some power would have beneficial consequences is likely to lead to a new power to coerce other men being conferred on some authority. Even if such power is not in itself bad, its exercise is likely to impede the functioning of those spontaneous ordering forces by which, without understanding them, man is in fact so largely assisted in the pursuit of his aims."
> — *Friedrich August von Hayek (1974), The Pretense of Knowledge.*

2.1 Central bank reaction function: "Taylor rule"

The monetary policy strategy of the ECB is of particular interest for the analysis of business cycles but even more so for the ongoing debate on rules versus discretion in monetary policy.[22] In order to explain the interest rate decisions of the ECB, one may estimate Taylor rule (1993) type reaction functions, according to which an interest rate under the control of the ECB is made dependent on variables like the domestic inflation rate and the output gap.

In this section, we estimate several instrument policy reaction functions for the ECB in the period ranging from 1999 to 2005. The results might contribute to a better understanding of the bank's interest rate setting behaviour. In particular, the result might help answering two questions, namely (i) whether the ECB has consistently followed a (sta-

[22] See *Carstensen, Colavecchio* (2004).

bilising) rule, and (ii) whether and how the ECB behaved differently than the US Fed Federal Reserve (Fed).

Due to the short history of EMU data, most papers on ECB monetary policy have up to now estimated a Bundesbank or a hypothetical ECB reaction function prior to 1999 and then, e.g. by testing its out-of-sample forecast properties, compared the implied interest rates with actual ECB rates.[23] There are only a few studies such as, for instance, Fourçans and Vranceanu (2002), Gerdesmeier and Roffia (2003), Ullrich (2003) and Surico (2003) which have actually estimated an ECB reaction function.

Most authors have so far chained up pre-EMU and post-EMU data to obtain long series. However, the implicit assumption of structural stability at the time of the EMU start inherent in these studies is hardly tenable according to our view. Moreover, it is questionable whether one can assume that the national central banks in the pre-EMU period followed on average a consistent strategy which can be compared without frictions with the strategy of the ECB (Belke and Gros, 2005). Hence, we base our analysis in this section purely on the euro area regime which started in January 1999.

The remainder of this section proceeds as follows. In section 2, we derive the empirical model. In section 3, we compare official monetary policy with actual policy as measured by some variants of the Taylor rule. For this purpose, we present estimations and simulations for the ECB and the Fed and check for deviations of actual monetary policy from the central banks' (Taylor) rules; section 4 finally concludes.

2.2 Theory and empirical evidence of the Taylor rule

In this section, we derive testable implications of the Taylor rule with a special focus on the ECB. Of course, analogous considerations apply to Taylor rules for characterising the Fed's monetary policy.

■ Theory

We start from the usual baseline specification of the Taylor rule concept which looks as follows:

(1) $i_t = \rho \cdot i_{t-1} + (1-\rho) \cdot (\beta_0 + \beta_1 \cdot y_t + \beta_2 \cdot \pi_t + \varepsilon_t)$.

The variables included in this specification are the short-term interest rate i_t, the output gap y_t, and the domestic inflation rate π_t. The parameters β_1 and β_2 reflect the long-run weight of the variables output gap (y) and the inflation rate (π), respectively, while the parameter ρ describes the extent of interest rate smoothing chosen by monetary policy. Exactly following other studies in this field, the money market rate is used to approximate

[23] See, e.g. *Clausen, Hayo* (2002), *Faust* et al. (2001), and *Smant* (2002) for the first approach and e.g. *Clausen, Hayo* (2002) and *Gerlach-Kristen* (2003) for the latter. For a good survey see *Sauer, Sturm* (2003).

the relevant policy rate. As usual, we base our output gap and inflation rate variables on time series which are measured ex post for period t.

An important empirical question relates to the estimated weight on inflation, i.e. to the parameter β_2. Since it is the real interest rate which actually drives private decisions, the size of β_2 needs to assure that – as a response to a rise in inflation – the nominal interest rate is raised sufficiently to actually increase the real interest rate. This so-called 'Taylor principle' implies that the coefficient β_2 has to be larger than 1 (Taylor, 1999b, and Clarida et al., 1998). If not, self-fulfilling bursts of inflation may be possible (see e.g., Bernanke and Woodford, 1997; Clarida et al., 1998; Clarida et al., 2000; Woodford, 2001). For monetary policy to have a stabilising impact on output, a less restrictive condition has to be fulfilled, i.e. β_1 should be positive.

In practice, it is usually observed that, especially since the early 1990s, central banks worldwide tend to move policy interest rates in small steps without reversing their direction quickly (Amato and Laubach, 1999, Castelnuovo, 2003, and Rudebusch, 2002). To incorporate this pattern of interest rate smoothing, our equation (1) is viewed as the mechanism by which the target interest rate i* is determined. The actual interest rate partially adjusts to this target according to $i_t = (1-\rho)\cdot i^* + \rho \cdot i_{t-1}$, where ρ is the smoothing parameter. This results finally in estimating equations (1) to (3).

In addition to this baseline model, we consider either money growth or the nominal dollar-euro exchange rate as an additional argument contained in the ECB reaction function. The influence of the monetary pillar of the ECB monetary policy strategy is examined by the specification:

(2) $i_t = \rho \cdot i_{t-1} + (1-\rho)\cdot(\beta_0 + \beta_1 \cdot y_t + \beta_2 \cdot \pi_t + \beta_3 \cdot \Delta m_t + \varepsilon_t)$,

which additionally includes the annual growth rate of money balances M3, m_t. We include money growth to model the monetary pillar of the ECB strategy which emphasizes the prominent role of M3 growth for interest rate decisions. This may reflect the leading indicator properties of money growth both for inflation (Altimari, 2001) and for the output gap (Coenen et al., 2001).

We also analyse whether ECB interest rate decisions are affected by changes in the nominal exchange rate of the dollar against the euro, exr_t:

(3) $i_t = \rho \cdot i_{t-1} + (1-\rho)\cdot(\beta_0 + \beta_1 \cdot y_t + \beta_2 \cdot \pi_t + \beta_3 \cdot \Delta exr_t + \varepsilon_t)$.

According to its monetary policy strategy, the ECB claims to pay attention to a broad set of economic variables that may help to assess the presence of threats to price stability. We see two arguments which speak in favour of an inclusion of the exchange rate in the reaction function. First, while it is not clear whether central banks directly react and should react to exchange rate changes (Taylor, 2001), the ECB might have been particularly tempted to counteract devaluations in the first years of EMU in order to establish the notion of a strong euro as an equivalent successor of the deutschmark. Second, a direct influence of exchange rate changes in the

instrument rule can pay off in terms of reduced inflation variance (Ball, 1999, Taylor, 1999b).

■ Empirical evidence

Many studies show that monetary policy in Germany[24] and the hypothetical euro area prior to 1999 followed the Taylor principle with β_2 exceeding 1.[25]

With respect to ECB policy, however, the preliminary consensus reached looks rather different. The results gained by Gerdesmeier and Roffia (2003) and Ullrich (2003) who use standard output gap measures based on Hodrick-Prescott-filtered industrial production contradict those brought forward both by Fourçans and Vranceanu (2002) who take the annual growth rate of industrial production as a measure of the business cycle and by the literature on Taylor rules for both Germany and the hypothetical euro area. While Fourçans and Vranceanu (2002) find the ECB to react strongly to variations in the inflation rate and much less to output variations, both Gerdesmeier and Roffia (2003) and Ullrich (2003) somewhat surprisingly identify small reactions to inflation and - both in relative and in absolute terms - strong responses to output deviations. Fourçans and Vranceanu (2002) arrive at coefficient estimates of β_1=0.18 and β_2=1.16 for the sample 1999:4-2002:2. Gerdesmeier and Roffia (2003) estimate β_1=0.30 and β_2=0.45 based on a sample 1999:1-2002:1. For a sample of 1999:1-2002:8, Ullrich (2003) comes up with β_1=0.63 and β_2=0.25.[26] Furthermore, Ullrich (2003) observes a structural break between pre-1999 and post-1999 monetary policy in the euro area.

The data issue

Following most of the literature, we use ex-post realized data and apply the generalized method of moments (GMM) to estimate the ECB and the Fed reaction function. In order to compare a Taylor Rule with actual monetary policy, we need to find proxies for the stance of monetary policy, inflation and the output gap. We conduct the GMM estimations both for quarterly and monthly data. All data are seasonally adjusted. Since our measure of the output gap based on industrial production is much more volatile than Taylor's (1993) original GDP-based output gap, the results might be biased and we mainly focus on the results based on quarterly data, as is also sometimes preferred in the literature (see, e.g. the survey by Ullrich, 2003). Only in the simulations part, we also use monthly data (Belke and Gros, 2005). Data are taken from Bloomberg and Thomson Financial.

The sample period for our estimations of the ECB and Fed interest setting behaviour is 1999Q1 to 2005Q02. We measure actual monetary policy by the three-month money market rates (ISR_EU and ISR_US). Euro area inflation is measured by the year-on-year percentage change in the harmonised index of consumer prices for the euro

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[24] See, for instance, *Clarida* et al. (1998), *Clausen, Hayo* (2002), *Faust* et al. (2001), *Peersman, Smets* (1998) and *Smant* (2002).

[25] See, e.g., *Clausen, Hayo* (2002), *Gerlach-Kristen* (2003), *Gerlach, Schnabel* (2000), *Peersman, Smets* (1998), and *Ullrich* (2003).

[26] A further example is *Surico* (2003a) who shows the following estimates: β_1=0.77 and β_2=0.47 for the sample 1997:07-2002:10.

area (D4LNCPI_EU). US inflation is calculated on the basis of the consumer price index (D4LNCPI_US). Money growth is measured by the year-on-year percentage change in M3 for the euro area (D4LNM3_EU), and by the year-on-year percentage change in M2 for the US (D4LNM2_US). The output gap (OUTPUTGAP_EU and OUTPUTGAP_US) is calculated by the first difference between real GDP in logs and the Hodrick-Prescott filtered log real GDP with the smoothing parameter set at $\lambda = 1600$). As exchange rate variable we used the annual growth rate of the nominal dollar exchange rate vis-à-vis the euro (GROWTH_EUROUSD), i.e. the first difference of order 4 of the log exchange rate. An increase of the exchange rate variable indicates an appreciation of the euro.

As far as the output gap specification is concerned, we strictly follow Clarida et al. (1998) and Faust et al. (2001) and complement our analysis with the use of monthly data. Using the industrial production index for the euro area, apply a standard Hodrick-Prescott filter (with the smoothing parameter set at $\lambda = 14{,}400$) and calculate the output gap as the deviation of the logarithm of actual industrial production from its trend.[27]

In the case of monthly data, we base our analysis of the ECB behaviour on the period from January 1999 to August 2005. The analysed time period for the US comprises the "Greenspan era", starting in August 1987. As exchange rate variable we used the annual growth rate of the nominal dollar exchange rate vis-à-vis the euro (GROWTH_USEUR), i.e. the first difference of order 12 of the log exchange rate. An increase of the exchange rate variable indicates an appreciation of the euro.

■ The estimation issue

The GMM approach essentially consists of an instrumental variables estimation of equation (1) and becomes necessary because at the time of an interest rate decision, the ECB cannot observe the ex post realized contemporaneous right-hand side variables in equations (1) to (3). Hence, it bases its decisions on information which comprises lagged variables only. The weighting matrix in the objective function is chosen in order to allow the GMM estimates to be robust to possible heteroskedasticity and serial correlation of unknown form in the error terms (for a recent application see Carstensen and Colavecchio, 2004).

The chosen instruments need to be predetermined at the time of an interest rate decision. Hence, they have to be dated on period t-1 or earlier. They should help to predict the contemporaneous variables which are still unobserved at time t. For exactly this purpose, we include the first four lags of the nominal interest rate, inflation, the output gap, money growth, and the effective exchange rate. The former three variables are typically used as instruments in related work (Sauer and Sturm, 2003, Gerdesmeier and Roffia, 2003, and Ullrich, 2003). We also include money growth and the nominal effective exchange rate. The choice of a relatively small number of lags for the instruments is intended to minimize the potential small sample bias that may arise when too many over-identifying restrictions are imposed. To confirm that we have chosen an appropriate in-

[27] Despite the increasing share of services in the overall economy, it is still commonly assumed that the industrial sector is the 'cycle maker' and that it leads significant parts of the economy. See *Sauer, Sturm* (2003).

strument set, we run a first stage regression of inflation and other variables of equation (1) to (3) on the instrumental variables and perform an F-test for their joint significance (Kamps and Pierdzioch, 2002).

A second important property of the instrumental variables is their exogeneity with respect to the central bank decisions and, hence, their uncorrelatedness with the disturbances which reflect deviations from the policy rule that are unpredictable ex ante. To test this property, we perform a standard J-test for the validity of the over-identifying restrictions (Hansen, 1982, and Tables 1 and 2). We dispense with the robustness checks by means of the ordinary OLS procedure which are widely used in the literature because otherwise the regressors would unlikely be weakly exogenous.

■ Empirical results for ECB policy

Table 1 presents a review of three different Taylor rule estimations based on our equations (1) to (3), using quarterly data. Column (3, equation (1)) shows the baseline scenario of equation (1). The degree of interest rate smoothing and the ECB's response to inflation is rather small, whereas the weight of the output gap is large (and significantly larger than for inflation).

Table 1. – Empirical Taylor reaction functions of the ECB
GMM estimations, Quarterly data, 1999Q1-2005Q2

Explanatory variable	Parameter	Specification Eq. (1)	Specification Eq. (2)	Specification Eq. (3)
Lagged interest rate	ρ	0.75	0.70	0.65
		(0.02)	(0.01)	(0.02)
Constant	β_0	0.02	0.02	0.03
		(0.004)	(0.001)	(0.002)
Output gap	β_1	1.94	2.41	1.12
		(0.08)	(0.06)	(0.14)
Inflation rate	β_2	0.49	-0.16	0.01
		(0.19)	(0.03)	(0.09)
Money	β_3		0.19	
			(0.03)	
Exchange rate	β_4			-0.04
				(0.009)
Statistics				
J-statistic		0.15	0.18	0.14
		(p>0.75, df=8)	(p>0.90, df=11)	(p>0.75, df=7)
R-squared		0.95	0.95	0.95

Notes: Standard errors are given in parentheses below the estimated values, p-values are given in parentheses below the J-test statistics (df = degrees of freedom). For the GMM estimation the first four lags of the short-term interest rate, the inflation rate, the output gap, the money growth rate (if implemented), and the rate of change of the dollar-euro exchange rate (if implemented) are used as instruments (see, e.g., Kamps and Pierdzioch, 2002, Carstensen and Colavecchio, 2004).

Compared to the original Taylor rule which postulates weights of 0.5 and 1.5 for the output gap and inflation, respectively, the influence of the business cycle situation on the decisions of the ECB seems to be strong. However, the inflation weight proves to be smaller than according to the original Taylor rule and falls considerably below 1. Hence, the so-called

Taylor principle $\beta_2>1$ which would guarantee that an increase in the nominal interest rate causes an increase in the real interest rate with the desired dampening impact on inflation is clearly not fulfilled. However, note that our findings are in line with the few other available studies.

Adding money growth and the exchange rate change to the Taylor rule specification (column 4, equation (2)), leads to a slightly different picture. Independent from the significance of the output gap and the inflation rate, we are able to establish a significant impact of money on the interest rate decisions. Moreover, the coefficient of money growth is positive as expected from theory. Presumably, this result is caused by the fact that the ECB considered the high money growth rates in the aftermath of the stock market downswing as portfolio adjustments that did make interest rate responses necessary.[28] At the same time and most remarkably, the coefficient of inflation changes becomes negative. One explanation for this quite striking result might be that the ECB pursued its anti-inflationary course by means of reacting to higher money growth rather than to actual inflation.

Another explanation might be that the ECB might not have responded strongly to actual inflation due to uncertainty and data release lags. Since inflation expectations on the part of the ECB (operationalised by the bank's near-term inflation outlook as published in the Bulletins) tended to fall short of actual future inflation in our sample, it should make a difference for the estimates which variables are used – actual or expected ones.[29]

In our final specification (column (5), equation (3)), the inflation variable even becomes insignificant. However, the coefficient of the output gap, albeit smaller, stays highly significant. Even though the coefficient of the exchange rate is relatively small compared to the ones of the other explanatory variables, it is highly significant and displays the expected negative sign. As discussed in Taylor (2001), an appreciation of the euro leads to a relaxation of monetary policy. Moreover, our point estimates are in the range analysed by Taylor (1999b). The significance of the coefficient of the exchange rate – although it is quite small – suggests that specification (3) describes the monetary policy rule of the ECB pretty well.

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[28] For a detailed analysis of the effects of the stock market downswing and the accompanying financial uncertainty on EMU money demand and on measures of excess liquidity derived from money demand, see *Carstensen* (2003) and *Greiber, Lemke* (2005).

[29] *Giannone, Reichlin, Sala* (2002), p. 11, deliver a third competing argument. They argue that the reaction function used here is not conditioned on shocks like demand or technology shocks but on the variables themselves. The use of a reaction function not conditioned on shocks might result in a coefficient smaller than unity depending on the ratio of inflation variance caused by demand to inflation variance caused by technology. A low value of this ratio causes a small coefficient. For a similar argument see also *Ullrich* (2003), p. 10.

Let us finally turn to the issue of interest rate smoothing. Note that our estimates of ρ, which range from 0.65 to 0.75, are quite high. However, coefficients are not so close to 1 so that the estimation uncertainty of the long-run weights would become really large. In fact, our results are in line with Gerdesmeier and Roffia (2003) who estimate ρ to be 0.72 and Fourçans and Vranceanu (2002) who arrive at an estimate of ρ=0.73.

The findings above appear to be robust in the sense that the J-statistic testing the over-identifying restrictions is insignificant across all specifications tested. In Table 1, we use the J-statistic to test the validity of over-identifying restrictions when we have (as in our case) more instruments than parameters to estimate. Under the null-hypothesis, that is the over-identifying restrictions are satisfied, the J-statistic multiplied by the number of regression observations is asymptotically distributed with degrees of freedom equal to the number of over-identifying restrictions (Favero, 2001). According to the results tabulated in the second last row of Table 1, all our models are correctly specified because all p-values are higher than their critical counterparts.

Overall, the results displayed in Table 1 are conclusive. All regressions show that interest rate policy from 1999 on did not follow the Taylor principle as β_2 does not exceed 1 consistently. The inflation parameter for the ECB period (β_2) is usually lower than the output parameter (β_1) and does not exceed one. Hence, from this pattern one might even conclude that the ECB tended to accommodate changes in inflation. This is also suggested by the standard specification in column 3 of Table 1 which reports a positive and significant coefficient for inflation.

The results presented above accentuate those of Gerdesmeier and Roffia (2003) and Ullrich (2003), who suggest that the ECB reacts to a rise in expected inflation by raising nominal short-term interest rates by a relatively small amount and thus letting real short-term interest rates decline. Hence, instead of continuing the Bundesbank's inflation stabilising policy, the ECB appears to have followed a policy rather comparable to the pre-Volcker era of the Fed, for which e.g. Taylor (1999a) and Clarida et al. (2000) have found values for β_2 well below one.[30]

■ Estimation results for Fed policy

Table 2 presents a review of three different Taylor rule estimations based on equations (1) to (3) for the US, again using quarterly data.

The results for the basic specification are displayed in Table 2 (column (3), equation (1)). Using ex post measured variables in the baseline specification (1) leads to a rather strong interest rate smoothing, a large weight of the output gap and an even larger one of inflation. Compared to the original Taylor rule with weights of 0.5 and 1.5 for the output gap and infla-

[30] *Taylor* (1999a) arrives at values of $\beta_1 = 0.25$ and $\beta_2 = 0.81$ with ex-post data for the US for that period, while *Orphanides* (2001b) estimates a forward-looking rule with real-time data and reports $\beta_1 = 0.57$ and $\beta_2 = 1.64$.

tion, respectively, the impact of inflation on Fed decisions is relatively strong. However, the weights of inflation and of the output gap are not too different. The inflation weight is larger than in the original Taylor rule and considerably above 1. Hence, the so-called Taylor principle $\beta_2>1$ is clearly fulfilled. Hence, an increase in the nominal interest rate tends to cause an increase in the real interest rate and a dampening of inflation.

Table 2. – Empirical Taylor reaction functions of the Fed

GMM estimations, Quarterly data, 1999Q1-2005Q2

Explanatory variable	Parameter	Specification Eq. (1)	Specification Eq. (2)	Specification Eq. (3)
Lagged interest rate	ρ	0.87	0.91	0.84
		(0.02)	(0.03)	(0.02)
Constant	β_0	-0.03	0.02	-0.03
		(0.01)	(0.04)	(0.01)
Output gap	β_1	1.98	1.77	2.97
		(0.22)	(0.35)	(0.31)
Inflation rate	β_2	2.57	2.51	2.27
		(0.52)	(0.98)	(0.48)
Money	β_3		-0.85	
			(0.59)	
Exchange rate	β_4			0.12
				(0.03)
Statistics				
J-statistic		0.26	0.20	0.21
		(p>0.50, df=8)	(p>0.50, df=7)	(p>0.90, df=11)
R-squared		0.97	0.97	0.96

Notes: see Table 1.

Adding money growth to the baseline variables yields (column (4), equation (2)), which has a stronger degree of interest rate smoothing than before. This does not change the pattern of the results for inflation and the output gap at all. However, in contrast to our estimates for the ECB, the sign of the coefficient of M2 growth is negative. Hence, higher M2 growth tends to lead to lower realisations of the policy variable.

If we finally include dollar-euro exchange rate changes in our Taylor rule specification (column (5) of Table 2), the coefficient of inflation remains highly significant. The coefficient of the output gap is even larger and again highly significant. Even though the coefficient of the exchange rate is relatively small compared to the ones of the other explanatory variables, it is clearly significant and has the expected positive sign.

At last, we should make some comments on the estimated extent of Fed's interest rate smoothing behaviour (row 2 of Table 2). The parameter ρ is estimated to be significantly larger than in the euro area and falls into a range between 0.84 and 0.91. From an economic point of view, our evidence on interest rate smoothing can be interpreted as follows. Since it captures the impact of the lagged interest rate on the current interest rate decision *i* becomes more and more important as ρ tends to one. Consequently, the relative importance of other explanatory variables should diminish. It may even be the case that they are not suitable anymore to ex-

plain the long run patterns of the policy variable (see, e.g., Carstensen and Colavecchio, 2004, p. 11). However, we observe exactly the opposite in the case of the Fed. The additional variables are highly significant and have coefficients which are large in absolute and relative terms. Overall, the smoothing parameter estimates a bit more away from 1 are obtained in the specifications 1 and 3 where the money growth indicator is not included.

■ Simulations

To shed light on the question as to whether the central bank complied with the Taylor rule in the more recent past, we make use of one-period-ahead forecasts. By doing so, we should be able to quantify the difference between the actual and the fitted, or Taylor, interest rate. We make use of static one-step-ahead forecasts based on our specifications of the Taylor reaction functions *including interest smoothing behaviour*.

In this context, (a) in-sample and (b) out-of-sample forecasts will be produced. Case (a) allows to investigate whether the central bank sets interests rates according to a Taylor rule which is estimated based on data for the whole available sample period. Case (b) shall provide insights as to whether the central banks stuck to their rule, which was estimated for a sub-period, throughout the total period under review.

While our in-sample forecasts (case (a)) are based on exactly the same estimations and especially the same estimation period which were presented in Tables 1 and 2, our out-of-sample forecasts (case (b)) necessitate the re-estimation of the same specifications for a shorter time-horizon. This ex-ante forecasting or post-sample prediction exercise helps forecasting observations that do not appear in the data set used to estimate the forecasting equation. Since case (b) would have resulted in a serious lack of degrees of freedom due to insufficient data points, we decided to make use of monthly data if we enact out-of-sample forecasts.[31]

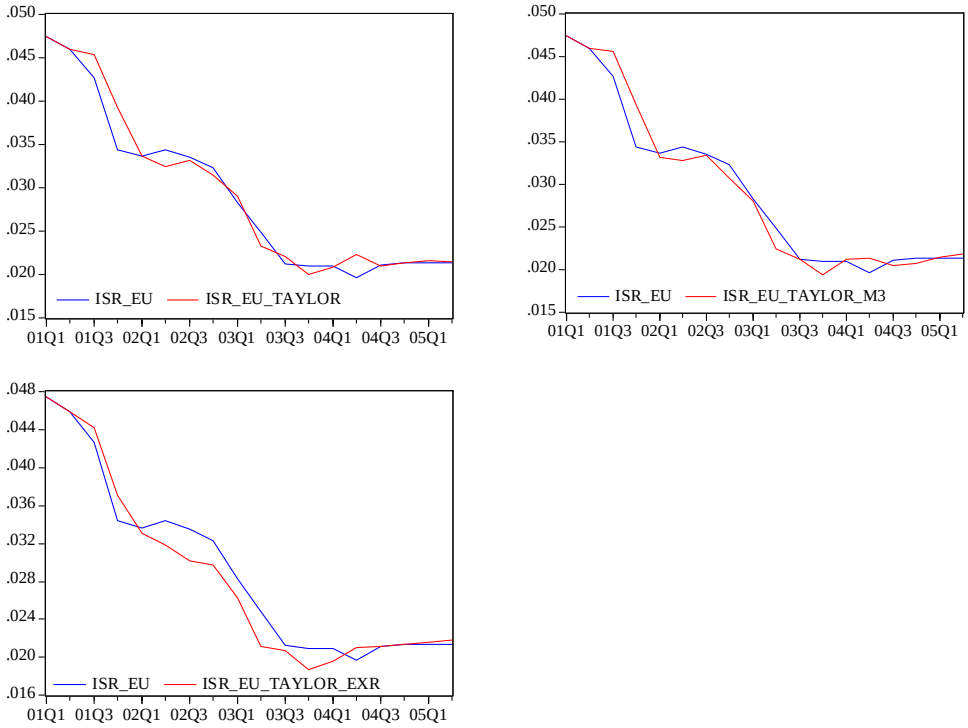
Figures 1 and 2 illustrate the results of the in-sample forecasts of monetary policy according to a Taylor rule which is estimated over the whole available sample independent on the start of the forecast period (case (a)). Figures 3 and 4 exhibit the prediction of a Taylor rule over the whole sample when this Taylor rule is estimated only up to the start of the out-of-sample forecast period (case (b)). Each Figure contains three graphs which depict the course of actual monetary policy together with the Taylor rule estimated by equations (1) to (3).

Our first choice for setting the start date of the forecast period is (the 11th) September 2001, because this started a period of unprecedented political and financial market instability. The second choice would be the turn-of-year 2000/01, with which came the meltdown of stock market

[31] *Inoue, Kilian* (2002) show that in-sample tests of predictability are at least as credible as the results of out-of-sample tests. Hence, there is no reason to emphasize only one type of forecasts a priori.

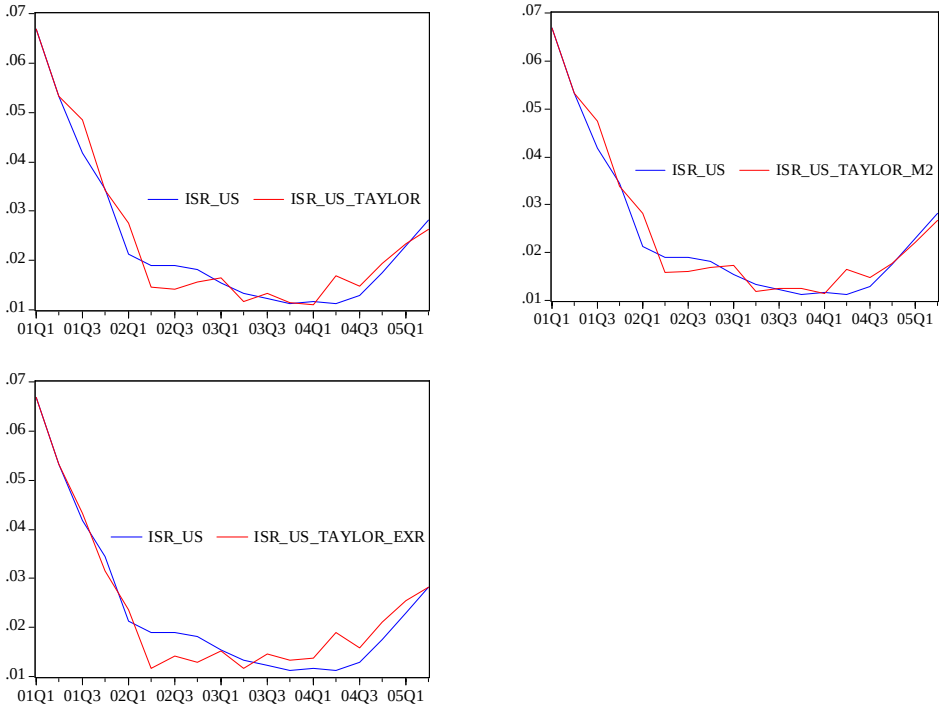
valuations (Belke and Gros, 2005). The exact dates of the chosen sample splits are recorded in the tables.

Figure 1. – Short-term interest rate and Taylor rate in the euro area
2001Q3-2005Q, full-sample estimates and in-sample forecasts



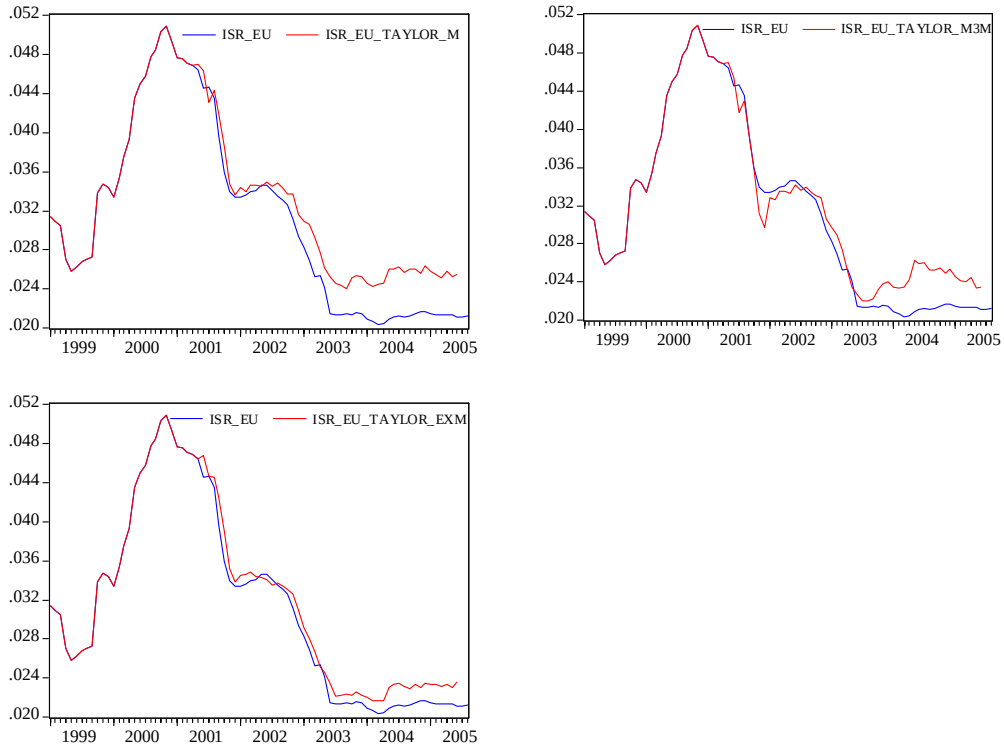
Note: One-Period-ahead in-sample forecasts based on GMM estimates. For details see footnotes to Table 1.

Figure 2. – Short-term interest rate and Taylor rate in the US
2001Q3-2005Q2, full-sample estimates and in-sample forecasts



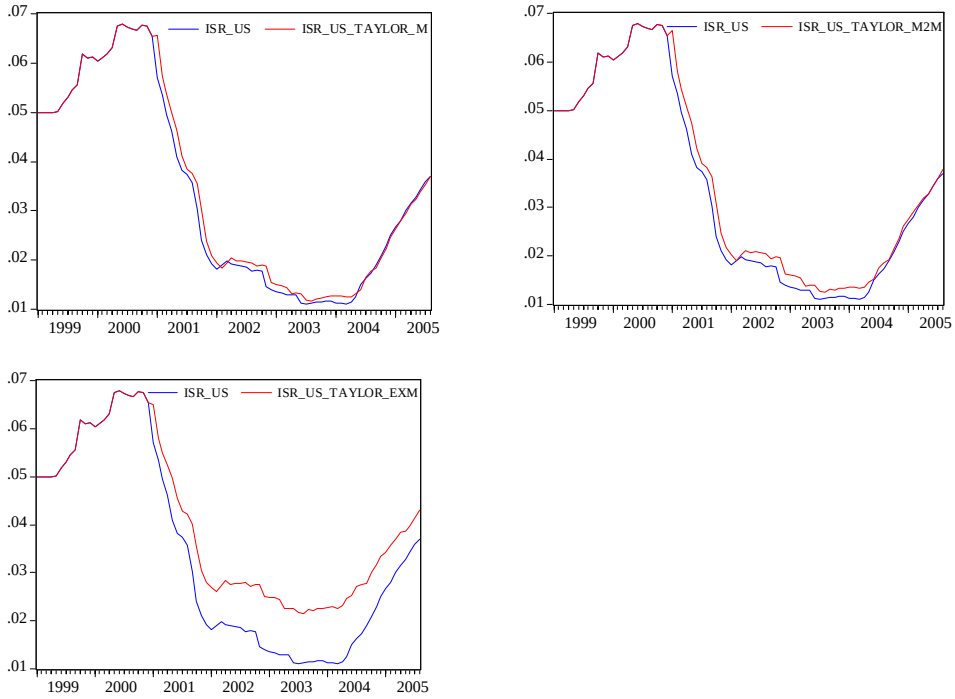
Note: One-Period-ahead in-sample forecasts based on GMM estimates. For details see footnotes to Table 1.

Figure 3. – Short-term interest rate and Taylor rate in the euro area
2001M05-2005M08, Out-of-sample forecasts based on GMM estimates



Note: Out-of-sample forecasts based on GMM estimates. Estimation period is 1999M01 2001M04 for the first two figures and 1999M01 2001M05 for the last figure. For the first two figures, the forecast period amounts to 2001M05-2005M08, and for the last figure it is 2001M06-2005M08. For further details see footnotes to Table 1.

Figure 4. – Short-term interest rate and Taylor rate in the US
2001M01-2005M08, out-of-sample forecasts based on GMM estimates



Note: Out-of-sample forecasts based on GMM estimates. Estimation period lasts from the start of the Greenspan area August 1987 until the start of the crisis of 2000/2001 in December 2000. For details see footnotes to Table 1.

As far as the in-sample forecasts for the euro area are concerned, the estimated realisations of the central bank rate follow closely the actual interest rate. This should be of little surprise, given the rather high R-squared of the estimations in Tables 1 and 2. In the most recent quarters in 2005, however, the Taylor rate slightly exceeded the actual ECB rate (the opposite is the case for the first two quarters of 2005 with regard to the Fed). This would imply that euro interest rates are currently slightly too low as compared with the implicit Taylor rule.

Next, according to the Taylor specifications including money growth, both monetary policies have been too expansionary during the third and the fourth quarter of 2001 and the first and the second quarter of 2004. A similar pattern emerges for specifications (2) and (3). In contrast, if one considers the specification including the exchange rate, euro area monetary policy appeared to have slightly too strict from the first quarter of 2002 until the first quarter of 2004. Let us now turn to our out-of-sample forecasts of the policy variable for the ECB and the Fed.

Note again that out-of-sample forecasting represents a particularly interesting exercise, as it allows detecting deviations of actual monetary policy rates from normative Taylor rate levels. Since it is generally agreed that evaluating forecasts must be done exclusively on their ex ante performance, we mainly comment on Figures 3 and 4.

As far as the euro area is concerned, one finds a significant negative deviation of the actual interest rate from the estimated interest rate which corresponds to the (Taylor) rule from the midst-of-2003 on up to August 2005. This is striking especially because we also included the estimated extent of interest rate smoothing in the normative Taylor interest rate and, by this, corrected for stickiness in interest rate setting in times of uncertainty. Overall, we conclude that ECB monetary policy has been to be too expansionary already since two years. The negative deviations of actual rates from the rule might be interpreted as a clear sign that the bank has significantly downgraded the role of money in its policy strategy and actual policy making since May 2003.

Fed actions appear to have been significantly different from that of the ECB. In fact, the Fed seems to have strictly followed its Taylor rule since 2000/01. Such a conclusion alters only if the change of the euro-dollar exchange rate is included in the Taylor rule specification. Here, the Fed did not react to the depreciation of the dollar as sharply as it did prior to 2000/2001. One explanation for this pattern might be that, given its multi-indicator approach, the Fed might have tried to help reducing the current account deficit by short-term rate changes. This could also explain why the fit between the actual and Taylor rate as shown in Figure 4, third graph, is not as perfect as depicted in Taylor (1993).

In general, the standard Taylor rule, with the Taylor's normative weights, appears to be a much better way to characterise the rate setting behaviour of the Fed than that of the ECB. Moreover, the Fed has shown a stronger (preference for) interest rate smoothing under the Taylor rule compared with the ECB. That might explain why, following the crisis of 2000/2001, the Fed's rates have remained in line with the Taylor rate whereas the ECB has deviated from its pre-crisis Taylor rule policy behaviour.

2.3 Concluding Remarks

According to the findings presented in this section, the interest rate setting behaviour of the ECB and the Fed in the period 1999 to 2005 and 1987 to 2005, respectively, can be pretty well characterised by some form of Taylor rule. However, the standard Taylor rule appears to be a much better tool for modelling the behaviour of the Fed than that of the ECB.

The empirical estimates for the euro area suggest that the ECB put a larger weight on the output gap relative to inflation (expectations). Such a conclusion is shared by other authors. Faust et al (2001) argue that the ECB puts too high a weight on the output gap relative to inflation, especially in comparison to the Bundesbank. However, the low weight which the ECB has assigned to inflation might be due to the fact that inflation was fairly low in the sample period. Moreover, the estimates also show that money growth and the exchange rate appear to have played an important role in the ECB' rate setting.

The test results indicate that the Fed has been following the estimated Taylor rule in a rather stable manner during the Greenspan era. This does not change if money growth is included as an additional variable in the Taylor rule, but it becomes somewhat less obvious when the change of the euro-dollar exchange rate is taken into account. As a particularly interesting side-aspect, money growth seems to have played an important role in Fed rate decisions as well.

Comparing the Taylor rule estimations of the two central banks, Fed displayed a much greater tendency for interest rate smoothing compared with its counterpart in the euro area. This might explain why, following the crisis of 2000/2001, the Fed's rates have remained fairly in line with the Taylor rate (even in view of a series of unprecedented interest rate cuts), whereas the ECB has deviated from its pre-crisis Taylor rule policy behaviour.

In fact, the findings do not suggest that the ECB has followed a stable rate setting pattern stabilizing throughout the sample period, whereas the Fed appears to have adhered to its rate setting behaviour. In fact, the ECB seems to have pursued too expansionary a policy after 2000/01.

Looking at contemporaneous Taylor rules, our results suggests that the ECB has de facto even accommodated changes in inflation and, hence, might have even followed a pro-cyclical, e.g. destabilising, policy. In contrast to the Fed, the ECB's nominal policy rate changes were not large enough to actually influence real short term interest rates. Such an interpretation gives rise to the conjecture that the ECB follows a policy quite similar to the pre-Volcker era of US monetary policy, a time also known as the "Great Inflation" (Taylor, 1999a).

However, in view of the results above some words of caution might be in order. Clarida et al. (2000, p. 154) argues that a short sample with little variability in inflation, especially with only small deviations from the target rate, might lead to too low an estimate of the inflation parameter. So far, data are only available for less than two completed business cycles and the actual inflation rate is close to the target the ECB has set itself. In that sense, recent inflation rates are not at all comparable to those during the 1970s. It might also be the case that the ECB would act much more aggressively against larger deviations of inflation from its own goal than can be seen in the data so far. As suggested by e.g. Clarida and Gertler (1996), central banks react differently to expected inflation above trend as compared to expected inflation below trend. They show that the Bundesbank clearly reacted in the former case, whereas in the latter case they hardly responded. Given data limitations, it is too early for us to tell whether or not the same holds for the ECB.

Finally, the data show a large degree of partial adjustment in the interest rate, i.e. short-term interest rates tend to be changed in several sequential steps in one direction. In principal, this could imply that policy responds too little and too late to changes in economic environment (Rudebusch (2002)). Rudebusch argues that this view is an illusion as the rate in-

ertia would reflect the policy response to persistent shocks to the economy.[32] Whether this is also true for the ECB is a question that we leave to future research.

"Taylor rule" – a critical review

If the Taylor-rule is recommended as a monetary policy strategy, several serious problems would arise. To start with, one must be aware that the Taylor-rule does really not qualify as an (intermediate) strategy. It merely adds the real growth objective to the objective function of monetary policy. This is not only in contradiction to the well-accepted "Tinbergen" principle of "one target, one objective". It would clearly disregard the strategic requirement of identifying variables that can be held responsible for future developments. However, there would various other conceptual challenges if the central bank were to follow the recommendation given by the Taylor-rule:

— It is well known that monetary policy affects the real economy with a (variable and unknown) time lag. The Taylor-rule, however, does not provide information regarding the future effects of monetary policy actions. In following the Taylor-rule, the central bank does not pursue a forward-looking policy and systematically acts too late to prevent target deviations (provided it uses actual rather than forecast variables).

— The feedback effects of the inflation and output gap can compensate each other, leading to questionable monetary policy recommendations. For instance, an inflation gap of zero, accompanied by a negative output gap (which is basically the scenario in the case of a forthcoming stagnation), requires the central bank to exert an expansionary monetary policy impulse. However, the central bank cannot be sure whether an increase of the money supply will affect growth or merely inflate prices.

— If the central bank is required to respond to output gaps, its independence could well be undermined. Take, for instance, the case in which the economy experiences a declining growth (trend) because of misplaced wage or tax and fiscal policy. The central bank would then be required to "bail out" the government's policy. Basically, the central bank would be held responsible for macroeconomic mismanagement, which, in turn, could conflict with the objective of price stability.

— The calculation of the real short-term equilibrium rate (nominal short-term interest rate less the inflation rate) poses a number of difficulties. Most importantly, the calculation of real equilibrium rates depends strongly from the time period under review or the theory applied. In addition, the question of whether consumer prices or the GDP deflator should be used remains unresolved. However, the latter issue can heavily influence the level of the real short-term equilibrium rate.

— Moreover, it is questionable as to whether the real short-term equilibrium rate can be assumed to be constant over time. This economic variable depends on the expected "marginal return on capital", the propensity to save and, most importantly, the credibility and reliability of the central bank's money market management. Even though changes in any of these variables will have profound

[32] *Sack, Wieland* (2000) offer three explanations of interest-rate smoothing: forward-looking behaviour by market participants, measurement error associated with key macroeconomic variables, and uncertainty regarding relevant structural parameters.

consequences for the real short-term equilibrium rate, they are not accounted for in the Taylor-rule.

— Furthermore, estimating (future) inflation and the output gap could be rather difficult.

Whether the Taylor-rule should be accepted or dismissed, however, depends on the result of a comparison with the best alternative strategy. The following compares a monetary policy based on the Taylor-rule with policy based on Monetary Targeting (MT).

According to the MT, the central bank changes the interest rate (Δi) according to deviations of the actual monetary growth rate (Δm) from the targeted monetary growth rate (Δm^*):

(1) $\Delta i = \lambda \cdot (\Delta m - \Delta m^*)$, and $\lambda > 0$.

If, for instance, actual money supply exceeds the targeted rate, that is $\Delta m > \Delta m^*$, the central bank is required to raise interest rates. To show the information content of the monetary aggregate, we must make use of the underlying ratio of MT, that is the transaction equation. First, we use the transaction equation applying the long-term equilibrium values of the variables. Solving for money supply growth, we yield:

(2) $\Delta m^* = \Delta y^* - \Delta v^* + \Delta p^*$.

Second, we use the transaction equation applying the current values of the variables. Solving for actual money growth, we yield:

(3) $\Delta m = \Delta y - \Delta v + \Delta p$.

If we substitute equation (2 and (3) for (1), we yield the central bank reaction function under MT:

(4) $i = i_{-1} + \lambda \cdot [(\Delta p - \Delta p^*) + (\Delta y - \Delta y^*) + (\Delta k - \Delta k^*)]$.

At first glance, the central bank reaction function under MT seems to issue similar recommendations to monetary policy based on the Taylor-rule. But it does not, as we will see later. However, in addition to the inflation gap $(\Delta p - \Delta p^*)$ and the output gap $(\Delta y - \Delta y^*)$, a third variable is added under MT: the liquidity gap $(\Delta k - \Delta k^*)$.[33] The liquidity gap is defined as the difference between the change in the actual amount of money market agents hold (k) less the amount market agents hold on average within a given period of time k^*. The liquidity gap can be rewritten (in logarithms) as: $k = \Delta m - (\Delta p + \Delta y)$ and $k^* = \Delta m - (\Delta p^* + \Delta y^*)$. (Of course, the liquidity gap is the reciprocal of the difference between the change in actual velocity of the money supply, less the trend change in the velocity of money.)

According to the MT reaction function, the central bank changes its interest rate from the level of the previous period (that is i_{-1}) by taking into account these three variables. Quite often, the equation above is subject to heavy misinterpretations. Intuitively, one could expect:

(1) the central bank should raise (lower) interest rates, if the inflation gap becomes positive (negative), other things being equal;
(2) the central bank should raise (lower) interest rates, if actual growth surpasses (falls below) trend growth, other things being equal, and
(3) the central bank should raise (lower) interest rates, if the liquidity gap becomes positive (negative).
(4) Even though these interpretations appear to be straightforward, they do not comply with the ratio of MT.

Re (1) If the actual inflation rate exceeds the targeted rate, the inflation gap becomes positive. At the same time, however, the liquidity gap declines by the same amount and the ensuing recommendation of the MT strategy is not to raise interest

[33] The liquidity gap can be rewritten as deviations of the actual velocity of money (v) from its long-term trend value (v^*), that is $\Delta v - \Delta v^*$.

rates. This finding can be explained as follows. If the inflation rate rises, and the nominal stock of money growth is "on track", real money supply decreases. Due to rising interest rates, declining asset prices and, in turn, lower consumption and investment, this alone exerts a restrictive monetary policy impulse on the economy. The central bank is therefore not required to change the official interest rate (that is, basically, change the amount of money in the economy).

Re (2) If actual growth exceeds the long-term trend rate, the output gap becomes positive. However, as long as the money supply is on track, the central bank is not required to change interest rates. The rationale for this 'passive' monetary policy is as follows: if the output gap becomes positive because actual growth exceeds trend growth, the liquidity gap takes on a negative value of an equal amount, compensating the positive output gap.

Re (3) If, however, the liquidity gap changes due to changes in money supply, the central bank is required to intervene. If actual money supply exceeds the targeted rate, this equates to the build-up of a monetary oversupply. Or, to put it differently, actual money holdings exceed long-term equilibrium holdings. As market agents' money holdings exceed the long-term amount, a spending increase in future periods can be expected, as supported by empirical evidence. As a result, in a MT model, the central bank does not act in response of deviations of actual inflation and growth as such but to (persistent) deviations of actual from targeted money supply growth.

Conceptually speaking, MT pursues a forward-looking, e.g. preventive, policy and is trend rather than cyclical oriented (as it is the case with the Taylor rule). Another interesting feature of the MT is that there is no "real short-term equilibrium interest rate". Under MT, the central bank is not required to restore or seek an equilibrium rate. It merely changes the official rates to keep the money supply on target. This not only appears prudent because of the "dynamic instability" problem of interest rate steering, but is well-supported by the notion that real interest rates are not stable over time. MT is thus not about defending a certain interest level but about stabilizing money supply growth by following a trend-oriented rather than an interventionist approach.

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Part 3
A call for publishing ECB Council meeting minutes

CONTENT: *3.1 The "lack of transparency" criticism. – 3.2 The pros and cons of publishing ECB Governing Council minutes. – 1.3 Conclusion and outlook.*

SUMMARY: *By publishing Governing Council meeting minutes, the ECB could improve the transparency and efficiency of its monetary policy substantially, thereby supporting its stability-oriented course for at least two reasons. First, publishing minutes should induce a positive disciplinary incentive for (i) improving the quality of the internal discussion among Council members and (ii) counteracting any inclination on the part of Council members to deviate from a euro-wide oriented monetary policy. Second, minutes should help keeping a better balance of "influence power" between ECB Executive Board members and NCB presidents compared to the current status quo. The rationale for publishing minutes should increase in view of the foreseeable extension of the Governing Council due to the Eastward extension of the euro area and the envisaged reform of the Council's voting modalities. Note that ECB Governing Council meeting minutes shall not necessarily attribute names to individual statement made in Council meetings; they shall serve to explain the ECB Council's thoughts, discussions and decisions to the public.*

> "The determination of global economic activity in recent years has been influenced importantly by capital gains on various types of assets, and the liabilities that finance them. Our forecasts and hence policy are becoming increasingly driven by asset price changes."
> — *Alan Greenspan, August 2005, Reflections on central banking.*

3.1 The "lack of transparency" criticism

It is a constituent feature of modern representative democracies to allocate power from the electorate to politicians, e.g. parliamentarians, who are then mandated to provide public goods ("principal-agency-relation"). Allocating power in this way poses two key questions. First: Is the provision of public goods made on behalf of the electorate's interest, e.g. compatible with the preferences of the people (we call this the "*preference problem*")? Secondly: Are the instruments used for deciding upon the qualitative and quantitative provision of public goods efficient ("*theory problem*")?

In most instances, these two challenges appear simultaneously. To meet these requirements, a common instrument to bring and keep political action in line with peoples' preferences is making use of the electorate's "*voice*". It use does not only mean that politicians will necessarily be voted out of office whenever the public good does not meet (perfectly) peoples' preferences. "Voice" also incorporates the disciplinary effect of "*criticism*". In fact, a critical public debate is an important tool

for improving on the decision making process in a democracy (in the spirit to what Karl R. Popper's called "critical rationalism").

However, the necessary condition of being able to criticise politicians' and bureaucrats' output is transparency within the political process; the performance of politicians and their agents can only be judged adequately by the voter if and when there is transparency about what is going on in parliaments and bureaucracies.

With regard to monetary policy, it is widely accepted that politically independent central banks should set their policies so that people can understand and, should the need arise (that is if monetary policy deviates, or risks to deviate, from its pre-set objective), express their criticism. From this point of view, transparency is therefore a crucial ingredient for keeping monetary policy in line with peoples' preferences. That said, how can transparency be brought about, and what is the "optimal" level of monetary policy transparency?[34]

The European Central Bank (ECB), which took control of euro area monetary policy in January 1999, has frequently stressed that transparency plays a crucial role in its so-called "stability oriented strategy": "In general, central banks should be open, transparent and accountable, reporting fully to the public on their activities, including their conduct of monetary policy. A transparent and accountable central bank reinforces its credibility by communicating clearly with the public and thereby signalling that its monetary policy is appropriately oriented to the maintenance of price stability. In this regard, the Eurosystem meets or exceeds the best practices of any central bank."[35]

Irrespective of such self-confidence on the part of the ECB, various policy watchers seem to take a rather different, even an opposing, viewpoint, actually having identified a lack of transparency on the part of the bank:

— Sylvester C. W. Eijffinger (Tilburg University and CEPR) states that the ECB lacks transparency in the way it makes interest rate decisions with respect to its policy goal, i.e. price stability.[36]
— Lorenzo Bini Smaghi (Member of the Executive Board of the European Central Bank) and Daniel Gros (Director of CEPS) emphasize that the ECB should be more open about the arguments,

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[34] For a general discussion see e.g. *Eijfinger, S. C. W.* and *Hoeberichts, M.* (2002) "Central Bank Accountability and Transparency: Theory and Some Evidence", International Finance 5, pp. 292-407; *Neumann, M. J. M.* (2002) "Transparency in Monetary Policy", Atlantic Economic Journal 30, pp. 353-365; *Thornton, H.* (2002) "Monetary Policy Transparency: Transparent about What?", Working Paper 2002-028B, The Federal Reserve Bank of St. Louis.

[35] See, for instance, *ECB*, Monthly Bulletin, January 1999, p. 42, Box 3.

[36] http://www.europarl.eu.int/comparl/econ/pdf/emu/speeches/20011218/eijffinger.pdf.

both pros and cons which shape the debate that precedes a decision.[37]

— Willem H. Buiter (European Institute, LSE) criticizes that the lack of openness, transparency and accountability could undermine the viability of the whole enterprise.[38]

— Charles Goodhart (former member of the Bank of England's monetary policy committee) said that the ECB should air its internal policy disputes (…) rather than relying on secrecy to give a false sense of unity.[39]

It has been argued that one way of increasing the transparency of ECB monetary policy would be to publish Governing Council meeting minutes. Providing insight into what is being discussed among ECB Council members is widely seen as a measure to strengthen critical rationalism, thereby helping euro area monetary policy to deliver price stability. In the following, we discuss the pros and cons of a decision by the ECB to publish its minutes in a more detailed fashion.

3.2 Pros and cons of publishing minutes

In democracies it is common practise that policy issues are publicly discussed and decided upon in parliament; such an exchange of views is open to the public at large. Anyone who wants is de facto able to gather information about the position of the government and about the counter-positions of the opposition. Parliamentary debates are thus living up to the requirement of democratic transparency. With regard to monetary policy, however, the ECB has defined transparency somewhat differently.[40]

■ ECB transparency

For delivering a high degree of transparency, the ECB makes use of various tools. After an interest rate decision meeting of the Governing Council, a press conference takes place. In an "introductory statement", the ECB President, accompanied by the ECB Vice President, outlines the Council's rate decision. Thereafter, the President invites journalists for a question and answer (Q&A) session. The transcript can later be downloaded from the ECB website. In addition, the Monthly Bulletin of the ECB usually reiterates the content of the latest introductory statement.

More specifically, an ECB's press statement contains (i) the ECB policy decision on interest rates, (ii) a relatively short summary of the

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[37] See their paper „Is the ECB Accountable and Transparent?", http://aei.pitt.edu/archive/00000567/01/1-Barcelona-EIPA.pdf.

[38] See *Buiter, W. H.* (1999) "Alice in Euroland", CEPR Policy Paper No 1.

[39] http://www.euro50.org/2005/athens05/Goodhart2.doc.

[40] See in this context ECB (2002), The Accountability of the ECB, Monthly Bulletin, November, pp. 45 – 57; ECB (2002), Transparency in the Monetary Policy of the ECB, Monthly Bulletin, November, pp. 59 – 66.

economic and monetary analyses and (iii) the result of a "cross checking of the two pillars"; the statement usually ends with comments on fiscal policy, a policy field which has – at least in the long-run – an indirect bearing on the stability outlook of the single currency.

In addition, the ECB makes use of further instruments with which it tries to deliver a high degree of transparency. More specifically, the bank produces and publishes:

— annual Reports which are presented to the European Parliament and submitted to the EU Council (ECOFIN), the EU Commission and the European Council (in the composition of the Heads of State or Government);
— convergence reports which inform about the progress made by those Member States outside the euro area towards fulfilling the Maastricht Treaty's convergence criteria;
— brochures and other information material concerning issues on money and monetary policy (monetary policy booklet, legal compendium, Blue Book about payment and securities settlement systems, general documentation on Eurosystem monetary policy instruments and procedures, etc.);
— economic research publications (Working Paper Series, Occasional Paper Series); and
— information about conferences and seminars; and, finally,
— speeches of ECB Executive Board members (as do the national central banks (NCB) for their governors).

Given the information released by the ECB, one could conclude that the bank would really qualify as the most transparent central bank in the world. But critiques cited earlier suggest that such a view is not universally held. As there is a widely held perception that ECB policy making is actually a "behind closed doors" affair, how can it live up to the need for transparency? The simple answer is: by publishing its meeting minutes.

■ Advantages of publishing minutes

When it comes to discussing the advantages of publishing ECB Governing Council minutes one might start with referring to an open letter written by Charles Goodhart to ECB President Jean-Claude Trichet published in the *Central Banking Journal* on 15 August 2005.[41] One interesting issue raised by Mr Goodhart is that the ECB – following a continental European tradition – would not provide a full account of the policy discussion, including differences of view. Mr Goodhart suggests that the ECB should air its internal policy disputes by publishing minutes rather than relying on secrecy to give a false sense of unity:

[41] See *Goodhart, C.* (2005), Dear Jean-Claude …, in: Central Banking, (http://www.euro50.org/2005/athens05/Goodhart2.doc), p. 33.

"It is hardly desirable, nor does it lead ultimately to credibility, to suggest that consensus existed when, in practice, it did not."

Following the lines of Mr Goodhart's argument, publishing ECB Governing Council meeting minutes might yield three major benefits:

— First, different arguments underlying the interest rate decision are presented in detail to the public. In this way, minutes could better explain the ECB Governing Council's interest rate decision. The publishing of minutes would, in turn, foster a better discussion between the central bank and the outside world (such as monetary policy observers).
— Second, by publishing minutes each individual member of the ECB Governing Council would have a greater incentive for better (pre-) preparation when it comes to taking part in a Council meeting.
— Third, individual members would feel greater responsibility for the decisions which are finally taken. Hence, the publication of minutes would increase accountability and strengthen the discipline of Governing Council for acting in accordance with the bank's mandate.

Mr Goodhart letter could also suggest that publishing minutes could keep a better level playing field for the "competition of ideas and thoughts" in the Council. According to Mr Goodhart, it seems to be common practise to write down the ECB press statement prior to the actual Council decision (which, if this holds true, would raise the question about when rate decisions are actually been made). This, in turn, would give the ECB Executive Board, e.g. its President, a great deal of power: "(…) you have an important sanction at your command for getting the agreement of all your many members on the governing council to the issue of that statement. This is that most of your national central bank (NCB) governors are keen to catch an afternoon or evening flight out of Frankfurt to get back home, and will therefore readily agree to almost any statement put before them in order to avoid delay."[42]

By publishing minutes which would be released with a certain time delay and which would require editing/commenting on the part of all Council members concerned, a better balance of "influence power" between the Executive Board members, especially the ECB President, and NCB presidents ECB Governing Council could be kept – thereby doing justice to the Council's principle "one member, one vote".

Minutes of the US Fed and Bank of England

US Federal Reserve

The Federal Open Market Committee (FOMC) is responsible for setting US monetary policy. It consists of twelve members – seven members of the Board of Governors of the Federal Reserve System; the president of the Federal Reserve Bank of New York; and four of the remaining eleven Reserve Bank presidents, who serve one-year terms on a rotating basis. The rotating seats are filled from the fol-

[42] *Goodhart, C.* (2005), p. 33.

lowing four groups of Banks, one Bank president from each group: Boston, Philadelphia, and Richmond; Cleveland and Chicago; Atlanta, St. Louis, and Dallas; and Minneapolis, Kansas City, and San Francisco. Nonvoting Reserve Bank presidents attend the meetings of the Committee, participate in the discussions, and contribute to the Committee's assessment of the economy and policy options.

The FOMC holds eight regularly scheduled meetings per year. At these meetings, the Committee reviews economic and financial conditions, determines the appropriate stance of monetary policy, and assesses the risks to its long-run goals of price stability and sustainable economic growth. The Committee unanimously decided to expedite the release of its minutes. The minutes of regularly scheduled meetings will be released three weeks after the date of the policy decision. The first set of expedited minutes was released at 2pm EST on January 4, 2005.

The FOMC minutes typically start with a list of the members present and ends with the vote on action, including who voted for and against the action. The focus is clearly the Committee's discussion and exchange of ideas related to the objective of price stability, employment and growth; issues such as, for instance, foreign exchange market, domestic financial market, demand (export, consumption, investment), labor market, industrial production, housing sector, business spending on equipment and software, real non-farm inventories, international trade deficit, consumer prices, consumer energy prices, core consumer inflation, producer prices, near- and long-term inflation expectations, employment cost are reviewed. Also, a review of the Committee's last decision, or forecasts/projections, of main economic aggregates is usually presented in the minutes.

In general, FOMC minutes appear to provide a relatively detailed picture of the issues which have been under discussion in the FOMC meeting and which have led to interest rate decisions. Readers of the minutes are also provided with information about which variables the FOMC takes into account when assessing the future path of inflation, growth and employment. This should make outsiders to be better positioned to form a view about forthcoming central bank reactions.

Bank of England

The Bank of England Act 1998 gives the Bank of England operational responsibility for setting interest rates to meet the Government's inflation target. Operational decisions are taken by the Bank's Monetary Policy Committee. The Committee meets on a regular monthly basis and minutes of its meetings are released on the Wednesday of the second week after the meeting takes place. The Bank's objectives in relation to monetary policy are to maintain price stability and, subject to that, to support the Government's economic policies, including its objectives for growth and employment. At least once a year, the Government specifies the price stability target and its growth and employment objectives. The MPC must meet at least monthly; its members comprise the Governor and Deputy Governors, two of the Bank's Executive Directors and four members appointed by the Chancellor.

The minutes start with a short introduction outlining the structure of the minuets: Before turning to its immediate policy decision, and setting it against the background of its latest projections for output and inflation, the Committee discusses developments in financial markets, the international economy, money, credit, demand and output; and costs and prices.

The chapter "financial markets" offers information on interest rate expectations (and the reason of such expected changes), exchange rate developments, equity and asset price action. The following chapter "international economy" gives a review about recent developments in the euro area, USA, Asia (growth, employment, exchange rate, consumption, and prices), oil prices, short outlook growth in world demand and export. In the chapter "money, credit, demand and output" detailed information is given about recent developments in GDP growth (recent developments in services sector output, production, consumption, investment); not

much is said about credit and money, though. The chapter "costs and prices" contains information about recent developments in employment, labour market conditions, earnings and labour costs, manufacturing input and output prices, oil prices, reasons of recent changes in the CPI. The following chapter outlines the Committee's central projection on growth and inflation, based on its collective judgement and the assumption that official interest rates followed the declining path implied by the market yield curve. The last chapter deals with the discussion of the Committee's decision and the decision itself (embers who voted on and against the proposition of Governor are mentioned with their names). At the end of each minute the names of the members and non-members who were present are listed.

In sum, the MPC minutes appear to be informative and well structured when it comes to forming a view about what has been under discussion in the central bank's decision making body. Compared to ECB press statements, the MPC minutes provide a much more valuable insight in the decision making process and, in particular, the arguments that led to the board's interest rate decision.

■ The ECB's line of argument

It seems fair to say that the experience in various countries with publishing minutes has been quite favourable in general; publishing minutes has actually become a widely-accepted feature of transparent monetary policy making. Against this backdrop the question arises: Why does the ECB not follow the practise of better informing the public about its internal discussion which leads to the setting of interest rates?

Being called upon to publish minutes, members of the ECB Governing Council generally tend to argue as follows:[43]

(1) If detailed minutes and voting records of Governing Council meetings – which are usually described as being very loyal and taking place under a "very good personal atmosphere" – were to be published, the quality of the discussions among Council members would suffer; in fact, meetings would become less frank and open minded as Council members would become increasingly concerned with the effect their questions/contributions to the outside world.

[43] See *Issing, O.* (1999) "The Eurosystem: Transparent and Accountable. Or Willem in Euroland", CEPR policy paper No 2; *Issing, O.* (2005) Communication, Transparency, Accountability: "Monetary Policy in the Twent-First Century", Federal Reserve Bank of St. Louis Review, March/April, Part 1, pp. 65-84. See also the speech delivered by *Hämäläinen, S.*, Member of the Executive Board of the European Central Bank, at the Citizens' Agenda 2000 NGO Forum on 3 December 1999 in Tampere "The single monetary policy: the role of transparency and openness", and the speech delivered by *Solans, E. D.*, Member of the Governing Council and the Executive Board of the European Central Bank, at Swedbank, Stockholm, 26 February 2001 "The euro and the Eurosystem - some issues of interest for the Swedish public". A more general overview is given in *Remsperger, H., Worms, A.* (1999) "Transparency in Monetary Policy", CFS Working Paper No. 1999/16, esp. pp. 9-12. An interesting discussion on this topic can be found in the Economist-Article "Coming in from the Cold" from the Economist print edition Sep 23rd 1999.

(2) The successful implementation of monetary policy would require that all ECB Governing Council members take a euro area-wide rather than a national perspective when it comes to interest rate decisions. Such a view would not be fostered if members were subject to public observation, especially so because media tend to have a rather nationally oriented view. The ECB would be concerned that publishing minutes and voting records could lead to an unwanted nationalisation of the debate. It could even invite political pressure on the individual NCB governors to vote according to national lines rather than considering the appropriate interest rate for the euro area as a whole.
(3) The publication of minutes would not lead to a better understanding of the monetary policy decisions. Instead, it often causes undue attention, in media and in the public discussion, to perceived differences in views among individual Governing Council members. Refraining from publishing minutes would avoid transmitting ambiguous signals to the public and financial markets, which, in turn, could lead to misunderstandings and thus policy inefficiencies.
(4) International experience has shown that publishing minutes would not necessarily contribute to the efficiency of the monetary policy, that is delivering price stability at lowest possible interest rate.

■ Counter-arguments

Whereas the ECB's line of argument certainly contains weighty aspects (especially in view of the discussion taking place when the ECB was still a rather young institution) the question is as to whether they will live up to a more critical examination. In the following, we will take a closer look at this issue.

Re (1): One would be inclined to think that there should be no problem of publishing the general line of arguments exchanged in an ECB Governing Council meeting, especially so when it takes place in an "atmospherically" good spirit, as no disputes would be revealed that could irritate the public. Furthermore, minutes as such do not have to – and, of course, should not – attribute names to arguments and positions held by individual Council members. The very idea of minutes is just to provide the public with insights into what is being discussed in a board meeting.

Re (2): The publication of the minutes and the voting records would not necessarily lead to an unwanted (re-)nationalisation of the monetary policy debate. In fact, one is actually inclined to think that exactly the opposite effect would hold true: Potential deviations from a euro area wide stability oriented monetary policy of the ECB would be brought to the surface. This, in turn, would protect the ECB against undue political pressure from, for instance, national governments. From this viewpoint, publishing Council minutes would actually be conducive rather than detrimental to a stability oriented monetary policy.

Re (3): There is strong reason to think that the publication of minutes would lead to a better understanding of the monetary policy decisions. Arguments presented in the Fed's and Bank of England's minutes, for instance, are much more detailed and insightful compared to the ECB's press statements and its Q&A session. If the debate in the Governing Council is controversial, "outsiders" should have the chance to hear about such disputes, and learn about the underlying arguments. A policy of reduced transparency is unlikely to solve internal disputes. Moreover, it may even lead to irritating signals which might create unwanted volatility in financial markets.

Ad (4): The hypothesis that international experience has shown that a publication of minutes would not necessarily contribute to the efficiency of the monetary policy is not backed by hard facts. One would actually expect that publishing ECB minutes would exert – sooner or later – a disciplinary effect on Council members to improve the quality of the internal monetary policy discussion – and thereby improve the quality of the results produced by central bank action.

3.3 More transparency and efficiency with minutes

Since its inception in January 1999, the ECB has taken great effort to convince monetary policy experts and the public at large that monetary policy efficiency would be negatively affected if the bank publishes Governing Council minutes. Admittedly, some of the arguments appeared brought forward by the ECB were quite striking when the bank was still at its infancy. However, in the meantime, that is after more than five years in charge of monetary affairs in the euro area, it is necessary that the ECB adapts is communication to a more "normal" policy environment.

To start with, in view of central bank experience made in, for instance, the US and the UK, it is fair to say that publishing minutes has generally been seen as improving monetary policy's accountability and transparency. Comparing with minutes of these central banks, the ECB press statement is much less detailed and insightful – and does not allow to forming a view of what is being discussed among Council members.

Publishing minutes would appear to make an important contribution to increasing ECB policy transparency, thereby exerting a positive impulse on a stability-oriented monetary policy. In fact, one is inclined to think that publishing minutes would help improving the quality of the internal discussion among Council members and counteract any inclination on the part of Council members to deviate from the policy ideal to take a euro-wide perspective.

The forthcoming extension of the euro area joint with the ensuing extension of the number of ECB Governing Council members could lead to disputes about the fundamentals of European monetary policy

and thus controversies about the "appropriate" interest rate policy. In the same vein, the forthcoming extension of the single currency area will not only lead to an increase in the number of ECB Governing Council members. It will also be accompanied with a rather complex reform of the voting modalities, which could all too easily cause irritations.[44] Against the background of these issues, it seems to be highly important that the public will have more access to information about the issues being discussed in ECB Council meeting, information that could be provided by publishing minutes.

Note again that, according to our view, ECB Governing Council meeting minutes shall not attribute names to individual statements. However, minutes shall serve to explain the ECB Council's thinking and decision to the outside world. Minutes shall give a full account of the policy discussion, including differences in views. In such a way, published minutes would thus stimulate a kind of two-way dialogue: They should help outsiders to better understand the policy makers' rationale for interest rate decisions and, perhaps even more important, they might discipline the Council itself to improve the quality of the monetary policy discussion and pursue a stability-oriented policy in the euro area.

Finally, ECB Council minutes should provide insight into the distribution of votes among Council members – without necessarily attributing names to it. Such a measure would make sure that each Council member takes a clear-cut position in the voting – which might not be the case if the majority decision would be "judged" by the ECB President. A record of the voting distribution in the minutes would also help keeping a better balance between NCB Governors and the ECB Executive Board.

[44] See, for instance, ECB (2003), The Adjustment of Voting Modalities in the Governing Council, Monthly Bulletin, May, pp. 73-83.

Part 4
ECB monetary policy and euro area inflation outlook

CONTENT: *4.1 Monetary developments in the euro area. – 4.2 Money and inflation – how long is the long run? – 4.3 Euro area inflation outlook.*

SUMMARY: *The inflation outlook in the euro area has deteriorated compared to our May 2005 forecast. Monetary policy appears too expansionary according to all standard measures, especially so against the backdrop of the "energy price shock". We estimate that annual inflation in 2006 will be 2.5% on average (excluding "special factors") with little signs that inflation will fall back to below the ECB's 2% upper ceiling anytime soon. The ECB would thus be well advised to bring interest rates back towards a more "neutral level" which we think is in the neighbourhood of 3.5%. – Looking at the relation between money growth and inflation in the US, the euro area and Japan, money expansion and price rises appear, over the long-run, closely related. The more recent findings of an alleged "weakening" of this relation might be explained by "excess money" increasingly inflating asset rather than consumer prices. However, asset price inflation would certainly be no less detrimental to the purchasing power of money compared with "traditional" consumer price inflation – and therefore monetary policy should not disregard asset price inflation when setting rates. The growth rates of money should be interpreted as a valuable guide for monetary policy makers.*

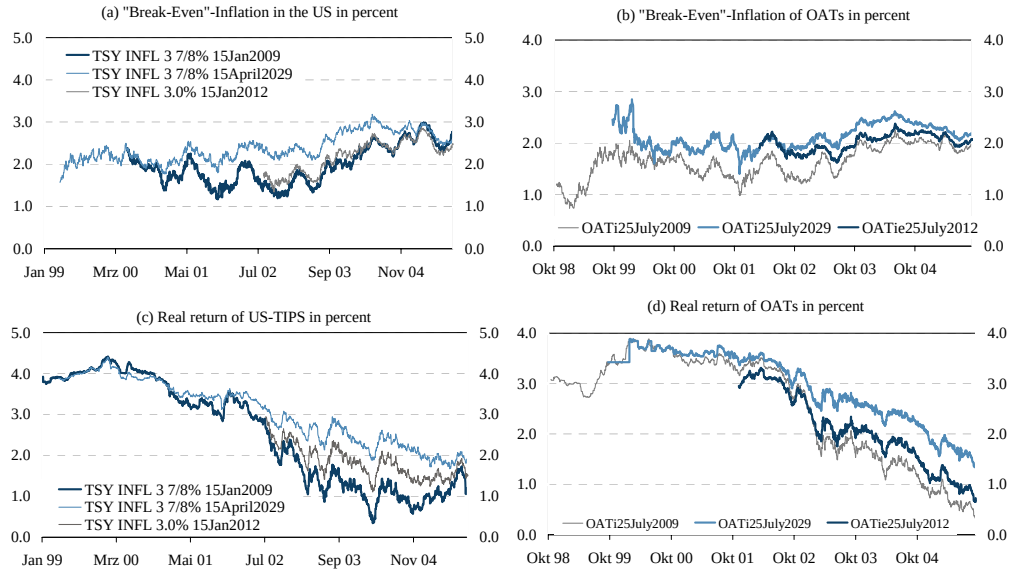
"It is impossible to grasp the meaning of the idea of sound money if one does not realize that it was devised as an instrument for the protection of civil liberties against despotic inroads on the part of governments. Ideologically it belongs in the same class with political constitutions and bills of right."
— Mises, L. von (1912), The Theory of Money and Credit, p. 454.

4.1 Monetary developments in the euro area

Financial markets' inflation expectations, as measured by "break even inflation" (BEI) of inflation-index French government bonds (OATs), seem to have settled (slightly) above the ECB's 2% upper ceiling (see Figure 1). Latest developments could even suggest that the reversion process, which set in around the beginning of 2004 when BEI was well above the 2% limit for longer-dated bond maturities, has come to an end.

Turning to the US, inflation expectations have remained between 2 and 3% of late, thereby more or less complying with what the markets' typically consider compatible with the US Federal Reserve's price stability definition. Graphs (c) and (d) in Figure 1 might provide an insight into the very factor that has brought long-term yields down to record low levels lately: The decline in nominal returns is actually driven by a marked decline in the real yield component.

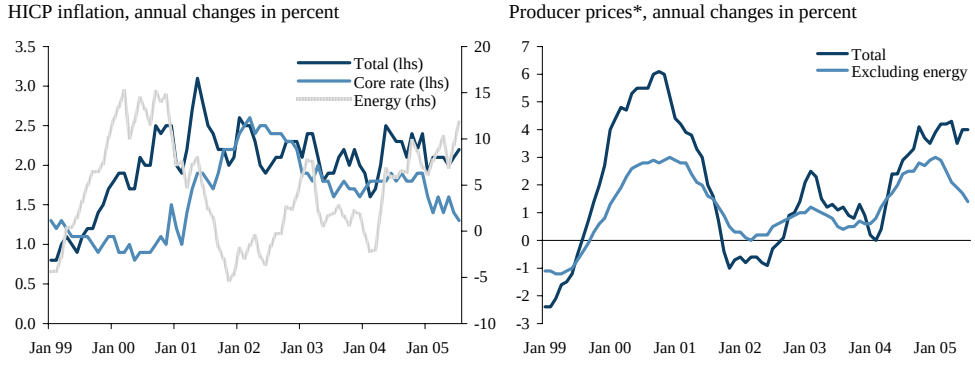
Figure 1. – "Break even inflation" and real yields in percent



Source: Bloomberg; own calculations. – Period September 1998 to June 2005, daily data. – The legends show the real coupon of the respective bonds, followed by the data of maturity. – The nominal yield of a bond, i_{nom}, can be decomposed as follows: $(1+i_{nom}) = (1+i_{real})(1+\pi^e)(1+\phi)$, whereas i_{real} = real rate component, π^e = inflation expectation and ϕ = risk premium. The so-called "Break-even"-inflation, which can be interpreted as being associated with market agents' inflation expectations, can be calculated according to the following formula:
$(1+i_{nom})/(1+i_{real}) = (1+\pi^e)(1+\phi)$.

Actual annual inflation of the HICP in the euro area has been close to 2.0% over the last year, rising 2.2% y/y on average. In August, inflation stood at 2.2% y/y (see Figure 2). The latest upward drift of headline inflation is to a large extent attributable to higher energy prices. Core inflation stood at 1.3% y/y, bringing the average rate over the last 12-months to 1.6% y/y. In general, the same development can be observed with producer prices. Rising energy prices have also driven a wedge between headline and core producer prices.

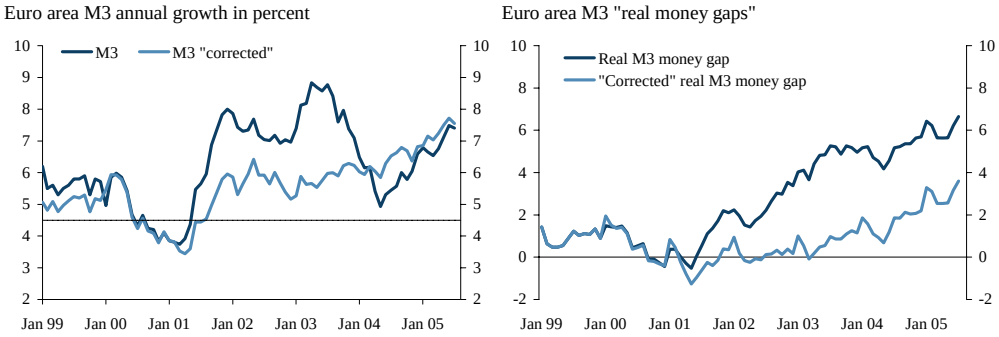
Figure 2. – Selected inflation measures in the euro area



Source: Bloomberg, own estimates. *Producer prices excluding construction

Whereas inflation expectations in the euro area have remained more or less aligned with the ECB's price stability promise – though it should be noted that this measure of ECB "credibility" has, if anything, deteriorated –, money supply growth has remained excessively strong, with the stock of M3 expanding at an annual rate of around 8.0% (see Figure 3). The ECB's preferred measure of excess liquidity, the "real money gap", is running at more than 6.0%, or, when calculated on the basis of the stock of M3 adjusted for portfolio shifts, has moved up to around 4.0%.

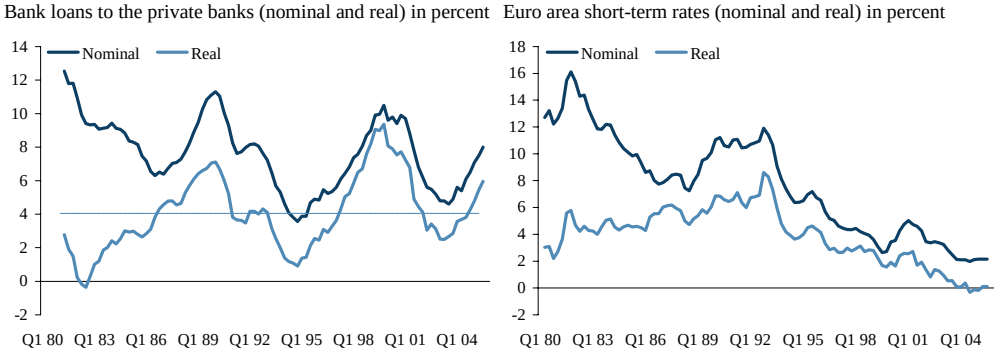
Figure 3. – M3 growth and "excess liquidity"



Source: ECB, Thomson Financial; own calcuations. Period: Jan 99 to July 05.

Strong money expansion has been accompanied by rather buoyant bank credit extension to the private sector (see Figure 4). For instance, bank loans to euro area residents (excluding governments) grew 8.4% y/y in July; total bank credit rose by 6.8% y/y. Underlying these date was an acceleration of loan growth to firms (standing at 6.9% y/y) and, most notably, loans to households rising 8.4% y/y (thereof, loans for house purchases grew 10.5% y/y).

Figure 4. – Bank loan growth and short-rates in the euro area



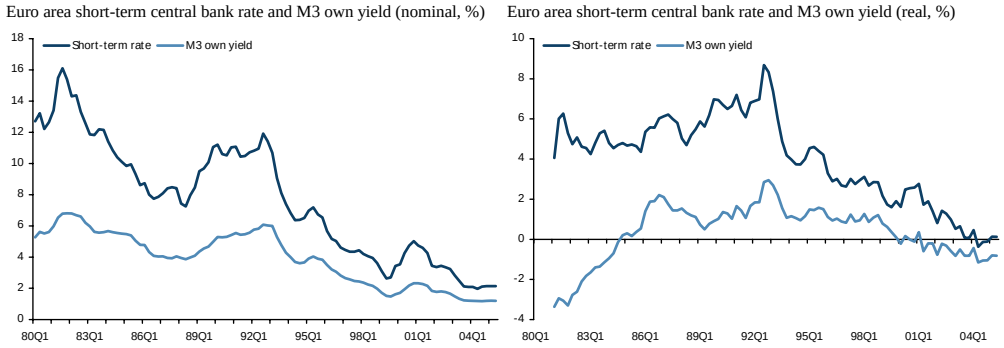
Source: ECB, Thomson Financial; own calculations. The real rate was calculated by substracting annual consumer price inflation from the nominal rate. Period: 1980-Q1 to 2005-Q3

Viewing in a long-term perspective, growth of bank loans to the private sector has been accelerating since around the end of 2003. In real terms, that is inflation adjusted, loan growth has moved well above its long-term average trend growth of around 4.0% y/y. At the same

time, nominal and real short-term central bank rates are at exceptionally low levels. For the ECB, the marked pick up in money creation should be seen as a warning sign, especially so given the still lacklustre expansion rates of total output and (strongly) rising asset prices.

It should be noted that since around Q2 2001 current consumer price inflation has been higher than the average return paid on deposits included in the stock of M3 ("M3 own yield"). That said, money holder have been burdened with negative real returns on their money balances (see Figure 5).

Figure 5. – Nominal and real short-term returns

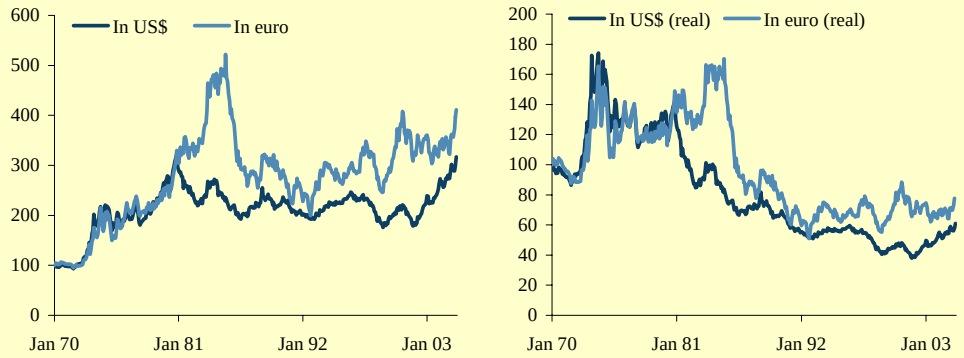


Source: ECB, Thomson Financial; own calculations. - Real rates calculated by substracting consumer price inflation from nominal rates. - For M3 own yields: ECB Observer estimates for Q1 and Q2 05.

"Cost-push" and a "negative real balance effect"

Commodity prices have continued to rise strongly in the last months. For instance, the CRB-Future price (in US dollar) has reached its highest level since the end of the 1970s (see graph below). In US dollar, the commodity prices (included non-energy commodity prices) were up 19% on an annual basis, or 17% in euro terms. Most importantly, already tight oil market fundamentals, refinery disruptions, heightened geopolitical concerns over the security of oil supplies, and weather-related supply disruptions pushed up prices substantially.

CRB-Future prices (nominal and real), 1970 to 2005



Source: Thomson Financials, Bloomberg; own estimates. – January 1970 = 100. – Deflated with consume price indices.

In the past, strong increases in input prices, in particularly oil prices, led to increased inflation concerns on the part of some investors. The thinking is that, for instance, higher prices would lead to higher wages which, in turn, induce corporates

to raise product prices. In the end, rising oil prices were followed, with a time lag, by higher consumer price inflation.

Lately, actual consumer price inflation has indeed become subject "cost push" effect related to higher energy price. For instance, US consumer price inflation in August was up 3.6% y/y, to a great extent influenced by higher energy prices; "core inflation", that is consumer prices excluding food and energy, stood at 2.1% y/y. In the euro area, the HICP inflation stood at 2.2% y/y in July, with the core index rising just 1.3% y/y.

However, current cost push effects do not seem to have a strong bearing on financial markets' inflation expectations. Or, to put it differently: markets do not seem to expect that "cost push" effects from higher commodity prices will actually lead to inflation – that is a persistent and ongoing rise in the price level. "Break even" inflation rates seem to suggest that financial markets expect long-term inflation, on average, to remain fairly close to central banks' price stability promises.

Increased global competition in product and factor markets appears to have reduced employees bargaining power when it comes to wage determination. At the same time, firms' pricing power – different to the "oil price shocks" in the 1970s and 1980s – is widely seen as having been reduced markedly. That said, the risk that rising commodity prices will induce consumer price inflation seems to have been greatly diminished when compared to former periods.

Perhaps most importantly, central banks are seen as being determined to deliver price stability, that is refraining from seeking a trade off of growth against higher consumer price inflation.

As a result, rising commodity prices as such are more likely to exert a dampening effect on output rather than translating into a classical upward drift of the economies' price levels. Economic theory would therefore suggest that the cost push effect stemming from higher commodity prices, if sustained, should result in a negative "real balance effect".

Finally, it should be noted that the rise in commodity prices, in real (that is inflation adjusted) terms is higher in the US compared to the euro area. This finding can be explained by the latest rise in the euro exchange rate vis-à-vis the US dollar.

4.2 Money and inflation – how long is the long run?

In their efforts to maintain low inflation, policymakers currently pay relatively little attention to the growth rate of the money supply. Yet many studies have found a close relationship between money growth and inflation, at least in the long run. But how long must money growth be strong before it should be of concern to policymakers? That is, what is the shortest period of time over which money growth seems to be reliably associated with inflation?[45]

There are two keys to reconciling findings of a close long-run relationship between money growth and inflation and policymakers' relative lack of interest in money growth rates. First, most studies that report a close connection in the long run use data for many countries, and it is sometimes noted that the finding appears to rely heavily on the presence of countries with high rates of money growth and inflation. It is much less

[45] In the following, we will draw heavily on the work of *Fitzgerald, T. J.* (1999), Money Growth and Inflation: How Long is the Long-Run?, in: Federal Reserve Bank of Cleveland, 1 August.

clear that a close relationship exists within countries with relatively small changes in money growth such as the US.

The second key is the time period associated with each observation. Even if a close relationship between money growth and inflation exists over the long run, that relationship usually disappears when one considers relatively short time horizons such as a year or a quarter. In conducting monetary policy, central banks monitor and seek to influence inflation and other economic variables over annual and quarterly intervals. A close relationship between money growth and inflation that exists only over very long time horizons is of little use to policymakers trying to control inflation over the next quarter or year.

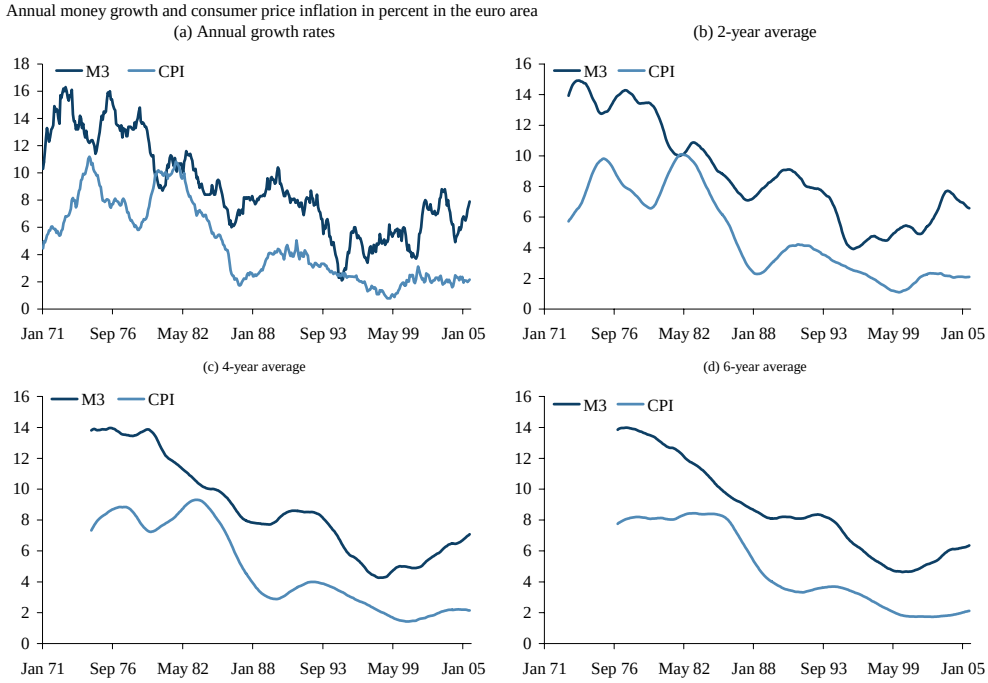
■ How long is the long-run?

Because there is the possibility of a close relationship between money growth and inflation in the long run, the lack of a clear relationship in the short run raises an obvious question—How long is the long run? That is, over what time horizon, if any, does a direct link between money growth and inflation emerge?

To answer the question of how long the long run is, the relationship between money growth and inflation is examined across three time periods—two, four, and six years. The question is whether the relationship between money growth and inflation is notably close over any of these time horizons, and, if it is, how clearly that relationship holds up over shorter time horizons.

Money and inflation in the euro area

Annual money growth and consumer price inflation in percent in the euro area



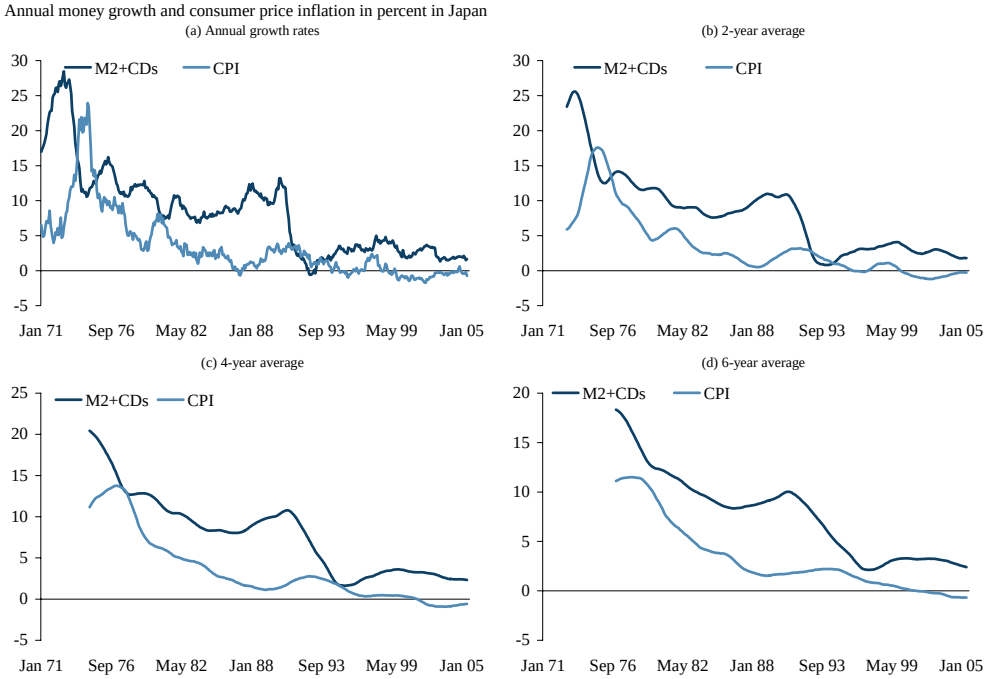
Source: ECB, Thomson Financial, Bloomberg. Period: January 1971 to July 2005; own calculations. – The simple correlation coefficient for contemporaneous relation is .78, for 2-year averages 0.83, 4-year averages .90 and 6-year averages .93.

For the period 1971 to 2005, in the euro area, money (measures as the stock of M3) growth and consumer price inflation exhibit a rather obvious relation, that is higher money supply growth is accompanied by higher inflation and vice versa. In view of simple correlation coefficients, the relation seems to be most pronounced when using gliding 6-year averages of growth rates.

In Japan, a similar relation between money growth and inflation can be observed. Like in the euro area, the relationship between money and inflation tends to increase with the length of the averaging period. The strongest co-movement is for a 6-year average.

Money and inflation in Japan

Annual money growth and consumer price inflation in percent in Japan



Source: ECB, Thomson Financial, Bloomberg. – Period: January 1971 to July 2005; own calculations. – The simple correlation coefficient for contemporaneous relation is .59, for 2-year averages .72, 4-year averages .87 and 6-year averages .90.

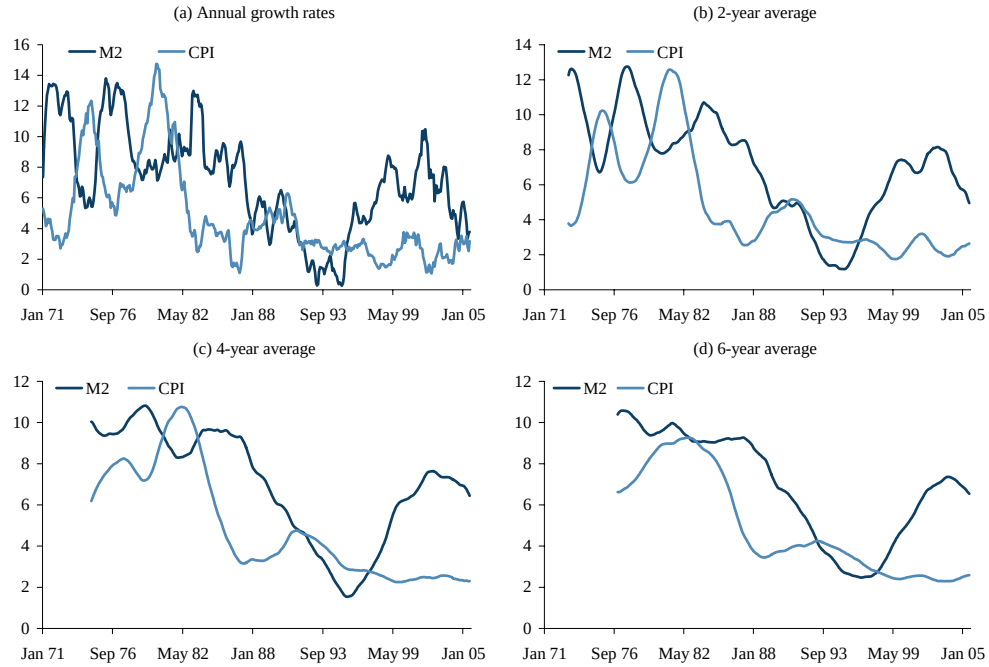
Finally, the relation between US money growth (in the form of the stock of M2) and consumer price inflation is positive, albeit generally lower when compared with the euro area and Japan. Again, the correlation coefficient rises with the length of the averaging period. Since the middle of the 1990s, however, the relation between money growth and inflation seem to have become somewhat looser.

The admittedly rather simple graphical analysis presented here suggests that a relatively close relationship between money growth and inflation may exist over long time horizons in all currency areas, at least for the broader monetary aggregates review. This finding serves as a reminder that ignoring money growth (for too long a period) may be unwise. Paying attention to money seems all the more important given that monetary policy has become rather concerned with "high frequency" data rather than with

long-run trend developments in the monetary field. While money growth may not provide a particularly useful guide for short-run policymaking, long-run trends in inflation may still be largely determined by the long-run growth rate of the money supply.

Money and inflation in the US

Annual money growth and consumer price inflation in percent in the US



Source: ECB, Thomson Financial, Bloomberg. – Period: January 1971 to July 2005; own calculations. – The simple correlation coefficient for contemporaneous relation is .20, for 2-year averages .36, 4-year averages .60 and 6-year averages .71.

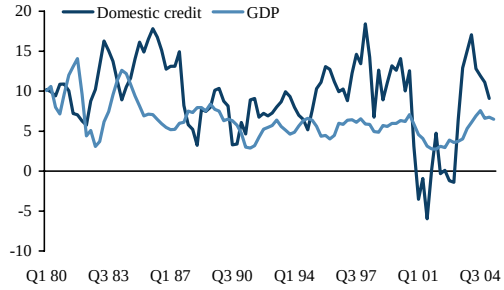
■ Where is "excess liquidity" going?

What might be the reason of money supply growth and consumer price inflation having become somewhat looser since the middle of the 1990s? Well, it might be that consumer prices do no longer represent a proper measure for capturing changes in the economies' total price level. In fact, "excessive" money and credit growth might have increasingly affected asset prices – such as, for instance, bonds, stocks, real estate and housing – rather than final production prices. That said, the potential existence of "asset price inflation" might therefore weaken the relation between money and consumer price inflation.

The following graphs on the left hand side show annual growth rates of nominal GDP and domestic credit in the US from the early 1980s to the second quarter of 2005. The relation is rather poor. However, when the stock market capitalisation is added to GDP, and annual growth rates are computed, the picture changes quite substantially: the graph on the right hand side shows the annual growth rate of GDP plus stock market capitalisation and the annual money expansion rate. The close relation is obvious.

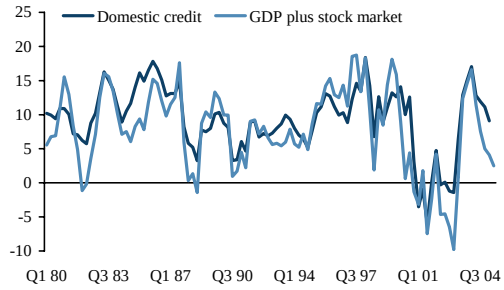
Domestic credit, output and the stock market in the US

US domestic credit and GDP (%, y/y, nominal)



Source: IMF, Bloomberg, Thomson Financial; own calculations.

US domestic credit growth and wealth[1] (%, y/y, nominal)

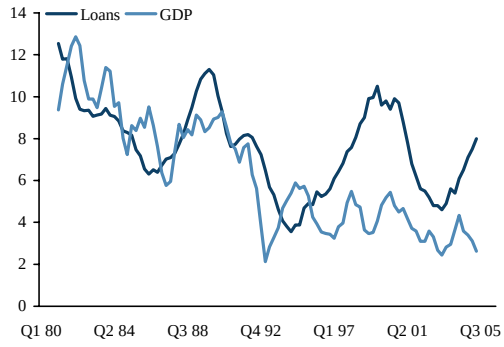


Source: IMF, Bloomberg, Thomson Financial; own calculations. 1) Nominal GDP plus stock market capitalisation.

Turning to the euro area, the relation between bank loan growth and nominal GDP is relatively closely related, at least until the early 1990s. Since the middle of the 1990s, however, the time series appear to be somewhat "out of tune". When calculating annual growth rates from an aggregate "GDP plus stock market capitalisation", however, the relation to banks' money creation is actually well restored.

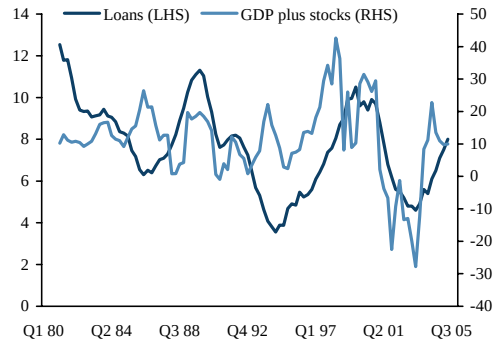
Domestic credit, output and the stock market in the euro area

Euro area bank loans and GDP (%, y/y, nominal)



Source: ECB, Bloomberg, Thomson Financial; own calculations.

Euro area bank loans and wealth[1] (%, y/y, nominal)



Source: ECB, Bloomberg, Thomson Financial; own calculations. 1) Nominal GDP plus stock market capitalisation.

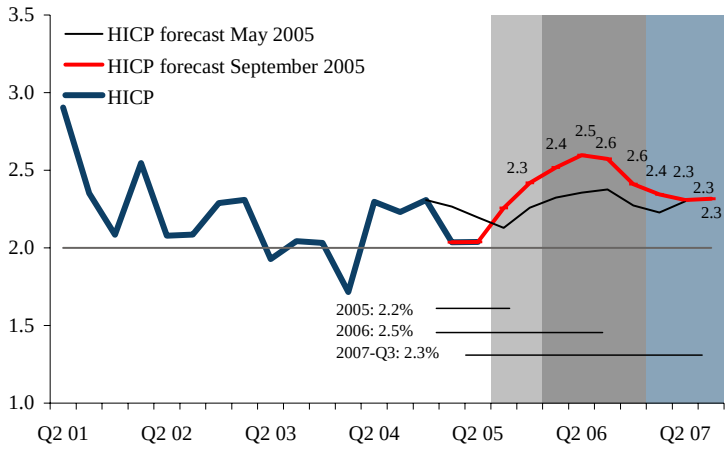
The finding presented above could suggest that the consequences of "excessive" money and credit expansion are no longer confined to final product prices (measured by consumer price indices and/or output deflators), but are increasingly affecting asset prices. If that was so, it would presumably be no longer appropriate for central bank to target consumer prices when the overall objective is the stabilisation of the economy's price level. Moreover, the perhaps growing importance of asset prices might explain why the traditional relationship between consumer price inflation and money and credit expansion has become somewhat blurred recently.

4.3 Euro area inflation outlook

Since May 2005, when we published our last forecast, the inflation outlook in the euro area has become less favourable. We now estimate that

average inflation (measured as the annual increase in the HICP) in 2005 will be 2.2%, unchanged from the previous estimate. In 2006, however, inflation will rise to 2.5% on average. Including statistical special factors (such as the envisaged health care reform in the Netherlands, taking effect as from January next year), inflation would be 2.7%. It should be noted that these estimates do not include the effects of a proposed 2pp VAT hike in Germany (which should, according to our estimates, add another 0.3pp to the annual HICP inflation).

ECB Observer inflation forecast, 2005-Q3 to 2007-Q4



Source: ECB Observer.

That said, euro area inflation will be above the ECB's 2% upper ceiling for inflation for the fourth consecutive year. To be sure: Inflation of "slightly higher" than 2% for a prolonged period of time is hardly in line with what the ECB's considers as price stability.

The expected upward drift of inflation largely rests on the assumption that (i) the output gap will, in the quarters to come, become somewhat smaller and (ii) that the very high stock of "excess liquidity" (measured as the "real money gap") will make itself increasingly felt in consumer prices following the "cost push" fact related to strongly rising energy prices.

The forecast model of euro area inflation rests on the "output gap", that is actual less trend GDP growth, changes in the exchange rate, changes in oil prices and, representing monetary developments, the "real money gap". The model captures the empirical finding that a narrowing of the output gap, when accompanied by rising real money gap, exerts upward pressure on consumer prices. Moreover, the inclusion of "cost push" factors, which allows taking into account "temporary shocks" to consumer price inflation.

The ECB Observer inflation forecast is somewhat higher than those provided by other forecasters and also above the ECB's own inflation projection. One reason for this outcome is certainly that our

model, in line with empirical findings, assigns an explicit role to money when it comes to determine the future inflation path.

Inflation forecasts, annual averages

	2005	2006
ECB-Observer	2,2 (2,2)	2,5 (2,4)
EZB[1)]	2,2	1,9
SPF[2)]	2,1	1,7
CE[3)]	2,0	1,7

Legend: Values in brackets: May 2005 forecast. – 1) ECB inflation projections (mid-points). – 2) Forecasts of the Survey of Professional Forecasters. – 3) Forecasts of Consensus Economics.

Source: ECB, Monthly Bulletin August; ECB Observer.

Forecast assumptions

		GDP[1)] growth	GDP[2)] trend growth	M3[3)] growth	Oil price[4)] (US-$)	EU-RO-USD[5)]	ECB re-fi rate
2005	Q2	1,1	1,9	7,2	45,7	1,30	2,00
	Q3	1,4	1,9	7,3	52,0	1,25	2,00
	Q4	1,5	1,9	7,0	55,0	1,25	2,00
2006	Q1	1,6	1,9	6,7	55,0	1,25	2,00
	Q2	1,7	1,9	6,3	55,0	1,25	2,25
	Q3	1,8	1,9	6,0	55,0	1,25	2,25

Legend: 1) real gross domestic product (GDP), annual change (%), seasonally adjusted. – 2) Potential GDP, annual change (%), past values calculated on the basis of level applying the Hodrick-Prescott-Filter; as from Q2 2005, estimate ECB Observer. – 3) Stock of money M3, annual change in %, seasonally adjusted. – 4) Oil price in US$ (Brent). – 5) EURO-USD is the euro-US-dollar exchange rate.

Source: ECB Observer.

In addition to our forecast target deviation, and as indicated in the previous chapter, excess liquidity seems to increasingly inflate asset prices – such as, for instance, bonds, stocks, real estate and housing, in numerous euro area countries. Such a development has a direct impact for money holders: Rising asset prices that are not compensated for by declining prices of goods and services would simply imply inflation, an erosion of the purchasing power of money. It should be noted here that asset price inflation is by no means less destructive for the value of money than "traditional" consumer price inflation. Interestingly enough, however, central banks and the public at large have remained relatively relaxed about the issue of asset price inflation. Moreover, asset price inflation, if reverted, could endanger the stability of the finan-

cial sector – and thereby exerting a negative impulse on output and employment.

To conclude, in view of expected inflation target deviations, a very high stock of excess liquidity – which still grows at fairly strong rates – and buoyant bank money creation, the policy recommendation for the ECB is to bring interest rates from their exceptionally low levels (both in nominal and real terms) back towards a more "neutral level", which should be in the neighbourhood of 3.5%.

Taylor rule rates and actual ECB rate

In a rather simple exercise, we calculated normative "neutral" ECB interest rate levels according to the Taylor rule (Taylor (1993)) for the period 1999-Q1 to 2005-Q2. The Taylor rule specification is as follows:

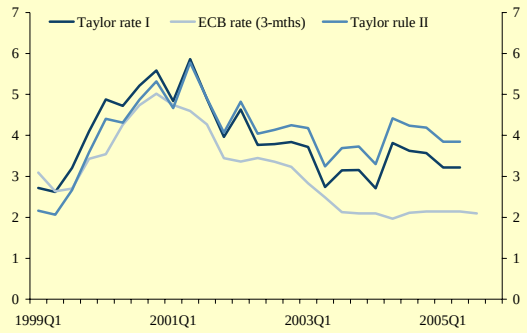
$$i = r + \pi + 0.5(\pi - \pi^*) + 0.5(y - y^*),$$

where i is the short-term interest rates as recommended by the rule, r = real equilibrium short-term interest rate, π = inflation and y = output; asterisks mark target and potential values, respectively. The ECB's inflation target is estimated to be 1.9% y/y. Potential output was estimated using the Hodrick-Prescott-Filter.

We calculated two Taylor rule rates. The first ("Taylor rate I") is based on the assumption that the short-term real rate equals the economy's growth potential. The second rate ("Taylor rate II") is calculated assuming that the real short-term rate was 1.9% throughout the period under review.

The graph below shows the two Taylor rates and the ECB's short-term interest rate (that is the euro money market 3-months rate). According to our estimates the neutral rate would be between 3.2 and 3.8% in Q2 05, contrasting the current actual rate of 2.1%. Moreover, the results of our (admittedly rather) simple exercise suggest that the ECB's actual rate has been well below the Taylor rates starting around the end of 2001.

Taylor rule rates and short-term ECB rate in percent



Source: ECB; Thomson Financial; own calculations.

See also, for instance, *Benner, J., et al* (2005), Leicht anziehen Konjunktur in Euroland, Die Weltwirtschaft, Heft 3, *Snower, D.* (ed.), pp. 13.

APPENDIX

APPENDIX

A.1. ECB's assessment according to Monthly Bulletins' editorals

Date	Actual inflation	Inflation projections	Output growth	M3[1] and	Credit expansion	Final assessment	ECB rate[2]
December 2000	"… slightly below 2.5% in 2000."	2.3% in 2001 1.9% in 2002	"… the short-term outlook points to some moderation in growth …" However, the underlying dynamism of growth continues to prevail."	5.5%	"… a continued high rate of growth in credit to the private sector …"	"… the Governing Council judges the risks to price stability in the medium term under both pillars of the strategy still to be on the upside."	4.75%
June 2001	"… inflation remains above 2.0% in 2001 …" "In 2002, inflation is likely to fall back below 2% …"	2.5% in 2001 1.8% in 2002	Real GDP growth in the euro area in 2001 is expected to come down from the high level reached in 2000 to levels more in line with trend potential growth …"	4.6% "…the indications from the first pillar are consistent with price stability over the medium term."	"… the annual rate of growth of credit to the private sector has continued to moderate over recent months …"	"There is a need to remain vigilant as regards developments affecting the balance of risks to price stability."	4.50%
December 2001	"… annual inflation rates have remained above 2% during most of 2002 …"	1.8% in 2003 1.6% in 2004	"It is expected, therefore, that economic growth will remain subdued in the coming months."	7.1% "There is ample liquidity in the euro area." "… it is unlikely at this juncture that this will translate into inflationary pressures."	"The recent moderation of the growth in loans to the private sector (…) supports this assessment."	"… the reduction in the key ECB interest rates on 5 December 2002 was guided by the assessment that prospects have strengthened for inflation to fall below 2% in the course of 2003."	3.25%
June 2002	"… inflation fell from 2.4% in April to 2.0% in May 2002. However, this decline is mainly due to a base effect …"	2.3% in 2002 1.9% in 2003	"Overall, they suggest that real GDP growth in the euro area should again be in line with potential growth later this year."	7.4% "M3 growth still partly reflects the portfolio shifts to M3 …"	"… annual growth rates of loans to the private sector have stabilised over recent months."	"To avoid inflationary pressure, (…) high wage increases must not spread across sectors and countries in the euro area."	3.25%
December 2002	"2002 inflation has been rather persistent despite the economic slowdown."	1.8% in 2003 1.6% in 2004	"The most likely scenario is that economic growth will gradually recover in the course of 2003 towards rates more in line with potential."	7.1% "There is ample liquidity in the euro area. However, particularly in the light of sluggish economic growth, it is unlikely at this juncture that this will translate into inflationary pressures."	"The recent moderation of the growth in loans to the private sector (…) supports this assessment."	"The key ECB interest rates have now reached a very low level by historical standards. The Governing Council will continue to monitor closely all factors that may affect the prospects for inflation in the euro area."	2.75%
June 2003	1.9% in May, "annual inflation rates are expected to hover broadly around this level for the remainder of 2003 and to fall significantly in 2004."	2.0% in 2003 1.3% in 2004	"… the latest data releases on real GDP growth have confirmed that economic activity in the euro area remained subdued …"	8.7% "… growth in the broad monetary aggregate M3 remained strong. Consequently, the euro area economy has continued to accumulate liquidity significantly above the amount needed to sustain non-inflationary growth."	"… loans to the private sector increased at a much more moderate pace than M3."	"… the economic analysis indicates that inflation rates should decline to below 2% over the medium term (…). The monetary analysis indicates that the strong expansion of M3 should not, for the time being, adversely affect this outlook."	2.0%

APPENDIX

A.1. ECB's assessment according to Monthly Bulletins' editorals (cont'd)

Date	Actual inflation	Inflation projections	Output growth	M3[1] and	Credit expansion	Final assessment	Rate[2]
December 2003	2.2% in November, "… inflation rates are likely to fluctuate around 2% over the coming months, a gradual and limited decline in inflation should take place later on."	1.8% in 2004 1.6% in 2005	"… euro area economic growth is likely to gradually recover over the next quarters, leading to a broader and stronger upswing in the course of next year and the year after."	7.5% "… should high excess liquidity continue to prevail once there is a significant strengthening of economic activity, it could lead to inflationary pressures in the medium term."	"The low level of interest rates has also supported the growth of credit demand."	"… the economic analysis indicates that the main scenario for price developments (…) continues to be in line with the definition of price stability. This picture is confirmed by cross-checking with the monetary analysis."	2.0%
June 2004	2.5% in May; "… these factors (…) should bring annual rates of consumer price inflation back to below 2% in 2005." "… there has been an increase in measures of long-term inflation expectations (…). … the recent upward trend calls for particular vigilance."	2.1% in 2004 1.7% in 2005	"… the recovery in euro area economic growth is expected to continue over the coming quarters, leading to a broader and stronger upswing in the course of next year."	5.2% "…the low level of interest rates continues to fuel monetary growth and the amount of excess liquidity remains high in the euro area."	*No mentioning*	"… the economic analysis indicates that the main scenario for the outlook for price developments (…) remains in line with price stability. Cross-checking with the monetary analysis also supports the case for vigilance with regard to the materialisation of risks to price stability."	2.0%
September 2004	Looking ahead, however, there are no indications at present of stronger underlying inflationary pressures building up domestically."	2.2% in 2004 1.8% in 2005	"Looking ahead, the conditions for a continuation of the recovery remain in place."	5.7% "M3 growth remains resilient." "There remains substantially more liquidity in the euro area than is needed to finance non-inflationary growth."	"The low level of interest rates also seems to be fuelling the growth of loans to the private sector …"	"… while the economic analysis indicates that prospects are consistent with price stability (…), a number of upside risks need to be carefully monitored. Cross-checking with the monetary analysis also supports the case for strong vigilance with regard to the materialisation of risks to price stability."	2.0%
December 2004	"The short-term outlook for inflation remains worrisome."	2.2% in 2004 2.0% in 2005 1.6% in 2005	"The available survey information for October and November points to ongoing growth in the fourth quarter, albeit at a more moderate pace than in the first half of this year."	6.1% "As a result of the persistently high growth in M3 over the past few years, there remains substantially more liquidity in the euro area than is needed to finance non-inflationary economic growth. This could pose risks to price stability over the medium term."	"Growth in loans to nonfinancial corporations has picked up further in recent months."	"… the economic analysis suggests that underlying domestic inflationary pressures are contained, but a number of medium-term upside risks to price stability need to be monitored closely. Cross-checking with the monetary analysis supports the case for continued vigilance with regard to the materialisation of risks to price stability (…)."	2.0%

APPENDIX

A.1. ECB's assessment according to Monthly Bulletins' editorals (cont'd)

Date	Actual inflation	Inflation projections[1)]	Output growth	M3[2)]	Credit expansion	Final assessment	Rate[3)]
March 2005	"In the coming months, annual inflation rates are likely to fluctuate around 2%."	1.9% in 2005 1.6% in 2006	"There are a number of reasons why the weaker real GDP growth in the second half of 2004 could be a transitory phenomenon."	6.6% "The latest monetary data confirm the strengthening of M3 growth observed since mid-2004." There is "substantially more liquidity in the euro area exists than is needed to finance non-inflationary economic growth."	"The exceptionally low level of real interest rates is also further stimulating private sector demand for credit."	"… the economic analysis confirms that underlying domestic inflationary pressures remain contained, while medium-term upside risks to price stability exist and will be monitored closely. Cross-checking with the monetary analysis supports the case for continued vigilance with regard to the materialisation of risks to price stability … ."	2.0%
June 2005	"Over the coming months, annual HICP inflation rates are expected to remain broadly around current levels."	2.0% for 2005, 1.5% for 2006	"Most recent indicators for economic activity remain, on balance, on the downside."	7.2% "… the increasingly liquid nature of monetary expansion, the accumulated stock of the broad monetary aggregate M3 may entail upside risks to price stability over the medium to longer term."	"… the euro area private sector's demand for MFI loans, in particular for house purchase, has remained strong."	"… the economic analysis suggests that underlying domestic inflationary pressures remain contained in the medium term. At the same time, it is necessary to underline the conditionality of this assessment and the related upside risks to price stability. Cross-checking with the monetary analysis supports the case for ongoing vigilance."	2.0%
September 2005	"Over the next few months, annual HICP inflation rates are expected to fluctuate around current levels, mainly due to recent developments in oil prices."	2.2% for 2005 1.9% for 2006	"The most recent survey indicators have, on balance, been supportive to the view that economic growth could improve in the second half of 2005, while higher oil prices continue to weigh on demand and confidence."	n/a "The liquidity situation in the euro area remains ample by all plausible measures, indicating risks to price stability over medium to longer horizons."	"Low interest rates are also fuelling credit expansion, with the strengthening of the demand for loans broadly based across the private sector. The growth of mortgage borrowing remains very strong. In this context, price dynamics in the housing markets need to be monitored closely."	"…the balance of risks to the baseline inflation scenario is tilted to the upside. Cross-checking the economic analysis with the monetary analysis confirms the need for particular vigilance in order to keep medium-term inflation expectations firmly anchored at levels consistent with price stability."	2.0%

Source: European Central Bank, Monthly Bulletins. – 1) Mid points. – 2) Numbers refer to the average growth rate of the last three months. – 3) Up to 21 June 2000, rate of the fixed rate tender; from 28 June 2000, rate of the variable rate tender at minimum bid rate.

APPENDIX

A.2. – Schedules for the meetings of the Governing Council and General Council of the ECB and related press conferences, remainder of 2005, 2006

Governing Council		General Council	Press Conferences
		2005	
6	October (Athens)		6 October
20	October		
3	November		3 November
17	November		
1	December		1 December
15	December	15 December	
		2006	
12	January		12 January
2	February		2 February
16	February		
2	March		2 March
16	March	16 March	
6	April		6 April
20	April		
4	May		4 May
18	May		
8	June (Madrid)		8 June
22	June	22 June	
6	July		6 July
20	July		
3	August		
31	August		31 August
14	September	14 September	
5	October (Paris)		5 October
19	October		
2	November		2 November
16	November		
7	December		7 December
21	December	21 December	

Source: ECB.

APPENDIX

A.3. – ECB OBSERVER – *recent publications*

Number	Title and content	Date of publication
No. 8	Back to the rules Content: *1. Rules for sound money. – 2. How the ECB and the US Fed set interest rates. – 3. A call for ECB Governing Council minutes. – 4. Euro area monetary policy and inflation outlook.*	27 September 2005
No. 7	Towards a "more neutral" monetary policy Content*: 1. A critical look at ECB staff inflation projections. – 2. Asset price inflation – a cause of concern for monetary policy. – 3. Impact of short-term rates on stock market returns. – 4. ECB rate and euro inflation outlook.*	16 September 2004
No. 6	Liquidity on the rise Content: *1. A case against ECB FX market interventions. – 2. "Price gaps" and US inflation. – 3. "Price gaps" and euro area inflation. – 4. ECB rate and euro inflation outlook.*	2 February 2004
No. 5	Challenges to ECB credibility Content*: 1. Fundamentals of ECB credibility. – 2. ECB strategy review – increasing the bank's open flank. – 3. Uncertainty – pressure for easier monetary policy. – 4. ECB policy review and outlook.*	8 July 2003
No. 4	International coordination of monetary policies – challenges, concepts and consequences *Content: 1. International coordination of monetary policies. – 2. Does the ECB follow the Fed? – 3. Stock prices – a special challenge for monetary policy. – 4. ECB monetary policy review and outlook.*	19 December 2002
No. 3	The Fed and the ECB – why and how policies differ Content*: 1. The US Federal Reserve System and the European System of Central Banks – selected issues under review. – 2. The reaction functions of the US Fed and ECB. – 3. The influence of monetary policy on consumer prices. – 4. ECB rate policy and euro area inflation perspectives.*	24 June 2002
No. 2	Can the ECB do more for growth? Content: *1. Should the ECB assign a greater role to growth? – 2. Government finances and ECB policy – a discussion of the European Stability and Growth Pact. – 3. "Price gap" versus reference value concept. – 4. Assessment of current ECB policy and outlook.*	19 November 2001
No. 1	Inflationsperspektiven im Euro-Raum Content: *1. Warum die EZB-Geldpolitik glaubwürdig ist. – 2. EZB-Strategie – Stabilitätsgarant oder überkommenes Regelwerk? – 3. Stabilitätsrisiken der Osterweiterung. – 4. Zinspolitik der EZB in 2001 und 2002.*	17 April 2001

APPENDIX

A.4. – ECB OBSERVER – *objectives and approach*

The objective of ECB Observer is to analyse and comment on the conceptual and operational monetary policy of the European System of Central Banks (ESCB). ECB Observer analyses focus on the potential consequences of past and current monetary policy actions for the future real and monetary environment in the euro area. The analyses aim to take into account insights from monetary policy theory, institutional economics and capital market theory and are supplemented by quantitative methods. The results of the analyses are made public to a broad audience with the aim of strengthening and improving interest in and understanding of ECB monetary policy. ECB publishes its analyses in written form on a semi-annual basis.

A.5. – ECB OBSERVER – *team members*

www.ecb-observer.com

Professor Dr. *Ansgar Belke*, born 28 March 1965. 1991 Diploma in Economics, University of Münster; 1995 Ph.D. in Economics, University of Bochum; 1997 Research Fellow at the Center for Economic Research, Tilburg/Netherlands, Visitor at the Centre for European Policy Studies, Brussels; 2000 Habilitation in Economics and Econometrics, University of Bochum; 2000 Visiting professor (C4) at the University of Essen, 2000 Full Professor of Economics, University of Vienna (C4); since 2001: Full Professor of Economics (C4), Head of 'Research Center for European Integration', and board member 'Eastern Europe Center', University of Hohenheim; since 2004: Research Fellow at the Institute for the Study of Labour (IZA), Bonn. Fields of interest: International Macroeconomics, Monetary Economics, European Integration, Venture Capital Finance. Publications in journals such as North American Journal of Economics and Finance, Open Economies Review, Public Choice, Scottish Journal of Political Economy, World Economy. Referee for journals like European Economic Review, Open Economies Review, Public Choice, and for the German Science Foundation, Volkswagen Foundation, German Economic Association, FEMISE Network (Forum Euro-Mediterranéen des Instituts Economiques). Presentations at international conferences such as 'Annual Econometric Society European Meeting', 'European Economic Association Congress', 'International Seminar on Macroeconomics (EEA and NBER)'. E-mail: belke@uni-hohenheim.de.

Professor Dr. *Martin Leschke*, born on 2 March 1962 in Oberhausen, Germany. From 1983 to 1989 studied economics at the Westfälische Wilhelms-University. From 1989 to 1993 assistant to professorship for economics, specialising in monetary economics (professor Dr. Manfred Borchert). Dissertation in 1993 at the University of Münster. 1994 research fellowship at the Center for Study of Public Choice, George Mason University, Fairfax, VA, USA (sponsored by DFG). Habilitation in 1998. From 1999 to February 2002 assistant professor at the University of Münster. Since March 2002, professorship of economics at the University of Bayreuth. Research focus: money theory and monetary policy, European integration, institutional economics, macro-economic issues.
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Professor Dr. *Wim Kösters*, born on 26 November 1942 in Greven, Germany. From 1963 to 1968 studied economics at the Westfälische Wilhelms-Universität Münster. From 1968 to 1969 stipendium at the Florida State University and Harvard University. From 1969 to 1982 assistant to Prof. Dr. Hans K. Schneider in Münster and Cologne. Dissertation in 1972 at the University in Münster. Habilitation in 1982 at the Universität in Cologne. From 1982 to 1991 Professor of macroeconomics at the University of Münster. Since 1991 professorship in theoretical economics I (Jean Monnet professorship) at the Ruhr-University Bochum. Memberships: Council for Economic and Social Policy – Verein für Socialpolitik, Working Group International Economic Relations and Working Council German Domestic Market of the List Association, Working Group Economic Policy and Development, Working Group Europe Policy and Science of the Konrad Adenauer-Stiftung, Brussels Initiative, Latin America Centre of the University of Münster (corresponding), Presidium of the Working Group European Integration, European Community Studies Association/USA. Research focus: monetary theory and monetary policy, macro-economics and stabilisation policy, labour market theory and policy, integration theory and policy with a special emphasis on monetary integration, international trade policy.
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Dr. *Thorsten Polleit*, born 4 December 1967 in Münster, Germany. From 1988 to 1993 studied economics at the Westfälische Wilhelms-Universität Münster. 1995 dissertation with Professor Dr. Manfred Borchert, professorship for monetary economics, specialising in monetary theory and policy. From 1997 to March 1998 ABN AMRO (Deutschland) AG, Frankfurt, Institutional Investor Equity Advisory. From April 1998 to September 2000 Chief Economist (Germany) at ABN AMRO (Deutschland) AG and ABN AMRO Asset Management GmbH. Since October 2000 at Barclays Capital in the Economics and Strategy Division. Since the end of 2002, he is a member of the Handelsblatt / Wall Street Journal Europe sponsored ECB Shadow Council. Thorsten is active in the fields of financial market and monetary policy theory research. In March 2003, he was appointed Honorary Professor at the HfB – Business School for Finance and Management, Frankfurt, lecturing Monetary and Financial Market Economics. Research focus: monetary theory and policy, and capital market theory.
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