# Transparency in Monetary Policy: A Survey

**by Volker Hahn**

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# Transparency in Monetary Policy: A Survey

By *Volker Hahn*[*]

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> No-one would dare say that they were against transparency (...): It would be like saying you were against motherhood or apple pie
>
> *Joseph Stiglitz*[1]

## I. Introduction

As the above quote highlights most people engaged in monetary economics claim to be in favor of central-bank transparency. So why is there such a ferocious controversy in the recent academic literature and in the newspapers about the transparency of monetary policy? In fact, almost no one involved in the political discussion about the transparency of the European Central Bank (ECB) actually denies that transparency is socially beneficial. Although the ECB has been accused of being opaque,[2] it claims to be open and transparent.[3]

One reason for the controversial debate about transparency, despite the seemingly wide-spread consensus that transparency is desirable, is that people have different views as to what transparency of monetary policy is (Winkler 2000). Central bankers often stress that the publication of data requires careful

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[1] Quoted in Financial Times 5 October 1998.

[2] See *Buiter* (1999), who accuses *Issing* to be "the enforcer for the ECB Opaqueness Squad". A commentary in The Financial Times of 15 October 1998 said: "The ECB intends to make decisions in secret, using forecasts it will not reveal, to achieve objectives it does not need to justify."

[3] See *Duisenberg* (1999). *Issing* (1999) writes that "transparency – appropriately defined – is absolutely crucial for the effectiveness of monetary policy".

comments and explanations by the central bank for the public to be able to make correct use of it (Remsperger and Worms 1999). Winkler (2000) criticizes that transparency is understood too narrowly in the academic literature where it is seen as the mere release of information. He emphasizes the importance of "common understanding" and the need for people to share a "common language". In his opinion it is problematic that communication issues arising from inefficiencies of information processing, inefficient information transmission or the bounded validity of the common-knowledge assumption are neglected in formal economic models. Although the concerns of Winkler (2000) are certainly of some significance, I will nevertheless abstract from these difficulties and will identify transparency as the alleviation of information asymmetries by the publication of the central bank's private information which is relevant for the policy-making process.[4] The antipodes of transparency are "opacity" and "secrecy".

Political considerations are often thought to strongly support transparency. As central banks have been made increasingly independent, mainly to protect them from politicians aiming at very short-term benefits of monetary policy, many people hold that democratic legitimacy should be strengthened by making central banks more transparent (Briault, Haldane, and King 1997). In their opinion, central banks must give more detailed accounts on their views on monetary policy, thus enabling the public to evaluate their performance (Buiter 1999; Geraats 2002b). Whether transparency is desirable from an economic perspective is not so clear-cut. In this paper we will mainly focus on economic reasons in favor of or against central-bank transparency.

We distinguish between three types of transparency, namely:

- goal transparency,
- knowledge transparency,
- operational transparency.

Goal transparency means transparency about the central bank's objectives. Increasing transparency in this respect could be achieved by publishing an inflation target, the output objective or the relative significance the central bank attributes to these targets. We use the term knowledge transparency to describe the publication of economic data or economic models used inside the central bank. These pieces of information include forecasts about future inflation, information from banking supervision, data on the real economy, and the whole model which is used for predicting future inflation. Operational transparency is concerned with the announcement of decisions such as the short-term interest rate target or interventions in the foreign exchange market. It also encompasses the dissemination of information on how decisions were reached, i.e., the voting records of the decision-making bodies and the publication of the minutes of the meetings.

Apart from this literature review, there is the early survey by Goodfriend (1986) which is discussed in subsection II.3. Geraats (2002a) distinguishes five dimensions of central bank transparency and surveys the theoretical and em-

[4] See *Geraats* (2002b) for a similar definition.

pirical literature.[5] An interesting and more practically oriented overview over transparency in monetary policy has been given by Blinder, Goodhart, Hildebrand, Lipton, and Wyplosz (2001). They argue that transparency is generally desirable, describe the present stance of central banks with respect to transparency and give recommendations how specific central banks could improve their communication strategies. My more moderate goal is a detailed description of the arguments in the literature in favor of and against the three different types of transparency. Since in many cases no consensus has been reached so far as to whether transparency is beneficial from a social perspective, I will simply summarize verbal arguments and the results of existing theoretical models and sometimes hint at their relevance or limits.

## II. Literature Overview

### 1. Goal Transparency

From a political viewpoint, a clear specification of what goals central banks should aim at seems essential for democratic accountability. Transparency about objectives is thought to be an important prerequisite for the evaluation of the performance of central banks. Thus, it does not come as a surprise that there is a reasonably robust conviction about the desirability of transparency about long-term objectives (Nolan and Schaling 1998; Blinder et al. 2001), which is especially pronounced in the inflation-targeting literature. One might wonder, however, whether the economic effects of goal transparency are also unequivocally beneficial. In fact, this does not seem to be the case.

The Bundesbank was often considered rather opaque (at least formally). But at the same time it was a very successful institution whose commitment to price stability was highly credible. In contrast, many institutions like the Bank of England and the Reserve Bank of New Zealand did not enjoy a track record of low inflation and in turn have adopted monetary-policy frameworks which are acknowledged to be among the most transparent in the world. This might lead to the conjecture that high-credibility institutions like the Bundesbank can afford to be opaque and there may even be some benefits of opacity for them, while it is optimal for low-credibility institutions to be transparent. To identify a formal rationale for this conjecture, Eijffinger and Hoeberichts (2000) present a time-inconsistency framework in the spirit of Kydland and Prescott (1977) and Barro and Gordon (1983) with shocks to the Phillips curve and uncertain central bank preferences.

However, as argued by Beetsma and Jensen (2002), this model has some problems.[6] An increase in goal transparency is modeled by reducing the variance of the parameter which describes the importance of the inflation objective,

[5] Political transparency as defined by her roughly corresponds to goal transparency in this paper. Her notions of economic transparency and operational transparency together are equivalent to knowledge transparency. What she defines as procedural transparency and policy transparency corresponds to operational transparency in this article.

[6] One problem is a “crude” Taylor approximation (*Beetsma* and *Jensen* 2002).

while keeping the mean of this parameter constant. The respective parameter for the deviation of output from its target is non-stochastic and normalized to one. This specification is questionable, since an increase in transparency as defined by the authors also affects the average degree of conservatism of the central bank, which is clearly undesirable and leads to spurious effects. An easy way to see this is to use the fraction of the emphasis the central bank puts on inflation and the sum of this parameter and the respective parameter for output deviations as a measure of conservatism. This measure of conservatism is a non-linear function of the stochastic preference parameter, which implies that its average value depends on the degree of transparency as defined by Eijffinger and Hoeberichts (2000). Solving these problems by introducing a specification which leaves the above-mentioned measure of conservatism invariant to changes in transparency, Beetsma and Jensen (2002) show that goal transparency is generally desirable. The average levels of output and employment are unaltered when the degree of transparency changes, but more uncertainty about the central bank's preferences raises the public's error in predicting inflation, which creates output variance. Moreover, opacity is associated with more variable preferences and hence with a larger variance of the inflation rate.

While Eijffinger and Hoeberichts (2000) associate a lower variance of a parameter of the central-bank loss function with more transparency, Hahn (2002) pursues a different approach, while basically using the same model as Eijffinger and Hoeberichts (2000). In his model, transparency is not assumed to affect the distribution of a parameter of the central bank's loss function. He assumes instead that under transparency the value of this stochastic parameter becomes known to the public, whereas under opacity the public is only aware of the prior distribution.[7] He assumes that the central bank's inflation target is fixed while the attention central banks pay to the output target is stochastic. Using this model, he compares social losses for both scenarios. It turns out that even within this simple framework one cannot give a clear-cut answer about the desirability of goal transparency. Goal transparency leads to larger deviations of inflation from its target, but reduces output volatility. Hence, society prefers goal transparency if output stabilization is deemed important, whilst it benefits from opacity if there is a strong social preference for low inflation.

It is rather easy to see why transparency lowers output variability. Opacity makes inflation expectations less accurate, which creates variation in output, since the Phillips curve depends on the difference between inflation and inflation expectations. The reasoning for the lower deviations from the inflation objective under opacity is more subtle. Under opacity, inflation expectations do not depend on the central bank's preference for output stabilization, the central bank's preferences being unobservable by assumption. Inflation expectations are independent of the central bank's preferences instead and always at an intermediate level. This intermediate level of inflation expectations together with the convexity of the central bank's loss function yields comparably moderate inflation rates for large realizations of the central bank's preference for output. Since excessively

[7] Applying this specification of transparency, he can safely use a loss function as in *Eijffinger* and *Hoeberichts* (2000) without incurring the arbitrary effects of transparency on the average degree of conservatism of the central bank.

high inflation rates do not occur, opacity reduces the average losses of deviations from the inflation target.

The findings of this model are to be taken with caution, since other kinds of uncertainty about central bank's preferences should be examined, e.g., shocks to the central bank's inflation target.[8] The robustness with respect to different specifications of shocks and variations of the model should be considered carefully. Another concern, which does not only relate to this paper, stems from the fact that announcements about objectives, in particular announcements about the relative significance of objectives, may be non-verifiable. If the time-inconsistency problem cannot be neglected, then there are incentives for central bankers to misrepresent their preferences. Additionally, it is not clear how transparency as defined in the model, i.e., the mere release of a parameter of the central-bank loss function, can be achieved. One might, however, argue that, e.g., the publication of minutes enables the public to learn something about the decision-maker's preferences over time.

In the presence of a time-inconsistency problem, uncertainty about the central bank's preferences may be beneficial, since in this case central banks choose contractionary monetary policy in order to signal a large emphasis on inflation, which reduces inflation expectations. An example of a paper where this effect is relevant is Geraats (2000).[9] She analyzes a one-period model where the sequence of events is reversed compared to the standard framework, i.e., inflation expectations are formed prior to the central bank's decision on monetary policy.[10] The public faces a twofold information asymmetry as it is unsure both about the central bank's inflation target and about a velocity shock which is perfectly known to the central bank. By setting money growth, the central bank influences the public's expectations about the velocity shock and, under the opacity of objectives, also affects the public's estimate of the central bank's inflation target. In consequence, high money growth rates are costly under opacity as they raise inflation expectations and thus output losses. Overall, opacity, by making high money growth rates undesirable and thus high inflation rates less likely, is socially beneficial.[11]

Another starting-point for the evaluation of the merits of goal transparency is to model explicitly the behavior of economic agents, e.g., unions, and to examine how their behavior is affected by more information about the central bank's objectives. A model of the strategic interaction between a central bank and a

[8] If one would draw the parameter which describes the significance of the inflation objective from a uniform distribution and assume the significance of the output target to be fixed, one would change the distribution of preferences, which might affect the findings about the variance of inflation.

[9] For the same reason, uncertain central bank preferences also lead to less inflation in the first period in *Sibert* (2002).

[10] The detrimental effect of goal transparency would vanish in this one-period framework, if the timing of events were as in the standard framework. If the central bank chooses its instrument after the formation of inflation expectations, monetary policy cannot affect the public's beliefs. Thus, it does not matter whether the central bank is secretive about their objectives or not.

[11] A similar conclusion can also be found in *Faust* and *Svensson* (2001), but goal transparency is not the paper's focus.

monopoly union has been established by Grüner (2002). He assumes that the central bank chooses inflation, after the union has fixed nominal wages. The significance the central bank attaches to the inflation target vis-à-vis the employment target is stochastic and unknown to the public. The author shows that less information with respect to this parameter leads to more cautious wage-setting by unions and thus to lower unemployment and inflation.[12] When uncertain about the central bank's preferences, unions are reluctant to set wages aggressively due to increasing costs from unemployment, i.e., risk aversion. Under uncertainty, high wages are likely to cause high unemployment if the central bank turns out to be very hawkish, while under preference certainty this risk does not exist. The model is interesting, but one might cast doubt on the practical relevance of the channel identified in the paper, namely that uncertainty about the central bank's reaction renders more cautious wage-setting by unions.

One of the few major central banks without an explicitly specified objective for its monetary policy is the Fed. Alan Greenspan has noted that it is hard to pin down the notion of what constitutes a stable general price level. Since there is a lack of consensus which measure for price stability should be used and each notion could at times give confusing signals, a specific numerical value for the inflation target would represent a delusive precision (Greenspan 2002).

Although future research on the economic consequences of goal transparency seems necessary, goal transparency may be desirable from a political viewpoint, since an institution which is very independent and is nevertheless responsible for an important field in economic policy should not pursue secret objectives in a democracy. Although Eijffinger and Hoeberichts (2000) conclude that transparency may not be desirable for high-credibility institutions, the more convincing specification introduced by Beetsma and Jensen (2002) establishes the desirability of goal transparency due to a reduction of output volatility and inflation variance. There is also a positive economic effect of the transparency of monetary policy objectives in Hahn (2002). Goal transparency may, according to this model, lower losses in terms of output, albeit at the cost of larger deviations of inflation from its socially optimal value. The point that goal transparency reduces the uncertainty about the central bank's behavior and thus leads to more accurate expectations and better decisions by economic agents should hold more generally. In addition, goal transparency may be accompanied by a change in central-bank objectives, guaranteeing that the central bank pursues socially optimal goals.[13]

[12] He also shows that less uncertainty about the central bank's preferences does not necessarily imply lower uncertainty about inflation rates.

[13] But the precise specification of objectives by the central bank might also induce pressure from the government if the government believes that the central bank should pursue a more lax monetary policy.

## 2. Knowledge Transparency

Knowledge transparency should lead to more accurate expectations of the public and thus better decision-making by economic agents. It should also enhance the credibility of the central bank as the public can judge more easily what the central bank's intentions are. Thus, one might expect knowledge transparency to be clearly advantageous. As we will see, in the theoretical literature the case is not that clear.

In recent years, with the popularity of central-bank transparency increasing rapidly, many central bankers and academics have suggested that transparency enhances the efficiency of monetary policy. Among them Blinder et al. (2001) argue that monetary policy can only affect very short-term interest rates directly. But monetary policy can only exert a powerful influence through long-term interest rates, asset prices or exchange rates. The link between short-term interest rates and these variables involves expectations of future monetary policy decisions. The authors argue that transparency enables the central bank to influence the public's expectations, which in turn makes monetary policy more effective. However, this reasoning may be doubted on the grounds that the central bank can and, in fact, will always influence expectations. If it is not through transparency, then financial market will derive the likely future monetary-policy stance from today's and past actions, which implies that expectations are affected by signaling.

With an expectations augmented Phillips curve, which is an ingredient to many theoretical models, monetary policy measures can only affect output or employment if they are not foreseen by economic agents. Thus, opacity may enable the central bank to exert an influence on output. However, it is well-known that central banks cannot boost output beyond its natural rate in the long run. So why could secrecy be beneficial? In a seminal paper Cukierman and Meltzer (1986) consider an infinite-horizon variant of the standard Kydland and Prescott (1977) and Barro and Gordon (1983) model. The authors introduce the assumption that the central bank's marginal value of inflation surprises cannot be observed directly by the public and is given by an AR(1) process with positive autocorrelation coefficient. The central bank controls money growth imperfectly and the size of the control error of money growth is associated with different degrees of transparency where the absence of control errors corresponds to a maximum level of transparency. Since the public cannot observe the central bank's marginal value of inflationary surprises directly, it tries to infer this parameter from the monetary target. Under maximum transparency, this is perfectly feasible. It is, however, beneficial to the central bank if the public is unaware of the value of inflationary surprise. Then the central bank can create inflationary surprises, when it esteems them very much. When the marginal value of inflationary surprises is low for the central bank, then the central bank chooses inflation to be lower than inflation expectations. On average, inflation expectations equal actual inflation, thus the assumption of rational expectations is not violated. The paper rationalizes why central banks might prefer a certain degree of ambiguity and opaqueness but does not reach a normative conclusion.

A normative conclusion is attempted by Lewis (1991), who examines a model that is rather similar to the one used by Cukierman and Meltzer (1986). She

identifies two reasons why society constrains central-bank secrecy. First, if due to shifting powers of interest groups, the central bank's preference for surprise inflation varies over time, central banks prefer secrecy to transparency. The reasoning is identical to the one in Cukierman and Meltzer (1986). If society tried to minimize central-bank secrecy, central bankers would choose other forms of secrecy which would imply higher costs.[14] Since central bankers will be able to achieve opacity anyhow, society tries to make opaqueness available at low costs. Second, due to the varying importance of the output-inflation trade-off, society may sometimes want to be surprised by inflationary policy. This, however, only works if society is unaware of its own loss function, which is a rather questionable assumption.

The paper by Cukierman and Meltzer (1986) has some disadvantages (Goodfriend 1986). One disadvantage is that issues of transparency and the control of money growth are jointly examined. This problem is solved by Faust and Svensson (2001) who assume the variance of the shocks to the relationship between money growth and inflation to be independent of the transparency regime. They explicitly distinguish between monetary control and transparency. In their model, monetary shocks are always perfectly known to the central bank, but only partly known to the public. The more informed the public is about these shocks, the more transparent monetary policy is. Social losses are assumed to be static, whereas the central bank's employment target follows an AR(1) process, which is a similar behavior as in Cukierman and Meltzer (1986).

Under transparency, the public's expectations about the employment target are more sensitive to the central bank's actions which has a moderating effect on the central bank's choice of money growth. E.g., even if the central bank would profit very much from surprise inflation, it would nevertheless refrain from inflationary policy. Inflationary policy would increase the public's expectation of the present employment target and thereby would also increase the public's expectation of the target in the future since the values of the employment target are correlated for subsequent periods. This in turn would increase inflation expectations for future periods drastically. Thus transparency raises the costs of inflationary policy for the central bank, and thereby is generally socially beneficial. But transparency is not always in the central bank's interest since the preferences of the central bank and of the public generally do not coincide.[15]

One might wonder whether the desirability of knowledge transparency is robust to different model specifications and, e.g., can also be established in a New Keynesian framework. Jensen (2002) lays out such a New Keynesian model which uses the same information asymmetries and formal description of transparency as Faust and Svensson (2001), but comprises only two periods. The public does not know the central bank's output target, which varies over time, and it does not know the control error of monetary policy. The (partial) release of

[14] *Lewis* (1991) reports that when there were attempts to force the Fed to publish the minutes of FOMC (Federal Open Market Committee) meetings, the Fed tried to abolish the minutes altogether.

[15] If the central bank's preferences were public, then the public's expectations of the central bank's employment goal would be independent of the central bank's actions. This would yield socially a very bad result.

this control error is associated with different degrees of transparency. It is important to note that this model features forward-looking behavior as inflation is not only determined by the output gap, which can be chosen at the discretion of the central bank, but also by the public's expectations about future inflation.

Similar to Faust and Svensson (2001) transparency has a positive effect since it disciplines monetary policy if the central bank does not enjoy a large amount of initial low-inflation credibility, i.e., the public's estimate of the central bank's output-gap target is very large. On the other hand, if initial credibility is high, transparency may be bad because it enables the public to infer the central bank's preferences more easily, thereby making private-sector inflation expectations more sensitive to monetary-policy changes. But as present inflation is assumed to depend on expectations of future inflation, a certain change in the monetary-policy instrument affects present inflation more strongly under transparency compared to opacity. As a consequence, transparency increases the costs of demand stabilization in terms of inflation. The author associates these ambiguous effects of transparency with the trade-off of credibility gains by more transparency vs. the losses of flexibility by more transparency. However, one could argue that the drawback of knowledge transparency identified by the author, namely a loss of flexibility to respond shocks, may be mitigated by more goal transparency.

In a note Jensen (2000) analyzes a variant of the aforementioned model. Having examined monetary shocks in Jensen (2002), he now considers the case where the central bank has private information on cost-push shocks, i.e., real shocks, prior to the setting of monetary policy. The publication of this private information leads to excess sensitivity of expectations making shock stabilization less efficient. It may, however, be questionable whether central banks have superior information on cost-push shocks. The author notes that firms may be well-informed about their own costs but less informed about aggregate cost-push shocks. It nevertheless seems more likely that central banks have superior information about monetary disturbances than about real shocks.

Several papers find that knowledge transparency helps central banks to overcome the time-inconsistency problem, because transparency makes inflation more predictable and thus a policy aiming at low inflation rates more credible. The paper by Geraats (2000) has already been studied in subsection II.1. since it also deals with goal transparency. The public is unsure about the inflation target and about the size of monetary shocks but observes money growth before forming inflation expectations. If the central bank releases its information about the velocity shock completely, then the public knows exactly how high inflation will be. Since knowledge transparency enables the central bank to commit itself to zero inflation, it is socially optimal.[16]

The same argument, namely that knowledge transparency alleviates the time-inconsistency problem, is also provided by Geraats (2001) who studies a standard two-period model with losses which are linear in output. There are demand shocks and supply shocks, which the public cannot observe but the central bank can observe perfectly. Under transparency, the central bank reveals the size of

[16] The result of this model is also one of the conclusions in *Gersbach* and *Hahn* (1999).

the shocks to the public. The central bank's inflation target is static and private information of the central bank. Information about first-period inflation and output is not available to the public when it forms expectations about second-period inflation. Under opacity, the monetary-policy instrument is used for conferring information both about the central bank's inflation target and about the economic shocks. The public's inflation expectations are therefore less responsive to interest-rate changes. This makes reputation-building less attractive and the inflation bias is higher compared to transparency. Opacity is beneficial to weak central banks since it obfuscates their preferences, making inflationary surprises possible, but it is detrimental for hard central banks. Overall social losses, understood to be determined by inflation and output, are always lower under transparency.

Knowledge transparency may anchor the public's inflation expectations, thus providing the central bank with more flexibility to respond to shocks. Then, as it prevents the central bank from cushioning these shocks efficiently, opacity may be harmful. This scenario is discussed by Geraats (2001) in a second version of the above-mentioned model, in which the central bank wants to stabilize output, but does not want to push output above the level that is sustainable in the long run. Under transparency, the public can infer the central bank's inflation target from the data on demand shocks and supply shocks published by the central bank. In contrast, under opacity interest rates, i.e., the central bank's instruments, are also used for signaling the inflation target, because the central bank is interested in accurate expectations of the public about its inflation target. Thus opacity hinders the central bank from optimal stabilization of shocks and is detrimental to welfare. But Geraats (2001) also argues that greater variations in interest rates might be a disadvantage of transparency, which would be especially severe if the financial sector were structurally weak. This argument is not entirely convincing since the costs of interest-rate variations could be considered by the central bank and incorporated into the central-bank loss function. Then socially inefficiently high interest rate changes would not occur.

Let us now turn to a potential drawback of knowledge transparency. While in the model that we have just discussed transparency provides the central bank with more flexibility to respond to shocks, transparency may also have the opposite effect if only unanticipated monetary policy measures affect output. Generally speaking, it is rather plausible that information may be harmful if it renders the insurance against bad outcomes impossible for agents. In fact, this general argument can also be applied to transparency in monetary policy, which is shown by Gersbach (1998) in a standard one-period model. The central bank may possess private knowledge on monetary shocks affecting the relation between money growth and inflation or real shocks to the Phillips' curve respectively. The author shows that the central bank always stabilizes monetary shocks perfectly. Hence these shocks do not affect inflation and the publication of forecasts of monetary shocks has no impact on inflation expectations and in turn does not change social losses. The case is different with real shocks. A negative real shock moves output away from its target which, due to increasing marginal costs of deviations of output from its target, makes surprise inflation very attractive. A positive shock moves output ceteris paribus closer to its target, which renders surprise inflation comparably unattractive. If the central bank's

information on real shocks is not published, the central bank can create surprise inflation when the real shock is negative and create surprise deflation when the real shock is positive. On average, inflation expectations are correct, and consequently the assumption of rational expectations is not violated. Since at times when shocks move output away from its target the central bank cannot counteract by inflationary surprises, transparency may be detrimental.

There is one drawback of the approach mentioned in the paper, which applies to many other models as well. It may be possible that real shocks influence the output objective as well. E.g., in Real-Business-Cycle models, varying output represents the Pareto-efficient allocation. Then output stabilization would not be beneficial. Another point is that uncertainty about inflation may be bad since it lowers investment. Then less public uncertainty about inflation would be an advantage of transparency. In a recent paper Cukierman (2001) presents two models in which the desirability of the publication of central-bank forecasts is evaluated. The first model is almost identical to the model in Gersbach (1998) and the author obtains the result that transparency may be harmful.[17] The second model considered by Cukierman (2001) is of the New Keynesian type. The central bank cares about multiple objectives, namely stabilizing inflation and output around their targets and minimizing interest-rate variability. Inflation depends on lagged output and a velocity shock, while output depends on the expected future real rate of interest and on a non-monetary shock to aggregate demand. Within this model it is shown that the publication of central-bank forecasts is detrimental to welfare as it leads to larger changes in interest rates, which are assumed to cause costs, e.g., because they endanger the stability of financial institutions. Again, it would be interesting to assess the costs of large interest changes which are foreseen by market participants.

As we have already mentioned, transparency improves the quality of the public's inflation expectations, which potentially increases welfare. In the model presented by Tarkka and Mayes (1999) the central bank has only one objective – an inflation target that is not known to the public. The economy is characterized by a standard Lucas supply curve and a quantity equation. Under transparency, the central bank releases its private information on shocks to the velocity of money in the quantity equation. Because the central bank is not able to observe the public's inflation expectations, its expectation of the public's inflation expectation and the public's inflation expectation are usually different. The authors, however, do not state clearly why the central bank cannot compute the public's inflation forecast. This should always be possible if all information available to the public is also available to the central bank. Most likely, the authors have in mind that the public's estimate of the central bank's inflation target is unknown to the central bank.

Their findings are the following: The structure of the model implies that the central bank reveals both its inflation target and its estimate of private-sector inflation expectations indirectly by publishing its output forecast and by setting

[17] Since monetary shocks are assumed to have a direct effect on output, *Cukierman* (2001), in contrast to *Gersbach* (1998), also obtains that transparency about monetary shocks is bad.

money growth.[18] The improved information set reduces the public's error in predicting inflation. Therefore, since output in the Lucas' supply function depends on the private sector's prediction error for inflation, output volatility is reduced under transparency. As the central bank has no incentive to misrepresent its information, the disclosed information is always credible.

The model hinges on the assumption that the central bank cannot observe private-sector inflation forecasts. This may, however, be doubtful. Usually inflation forecasts are assumed to have an effect on monetary-policy outcomes because they are incorporated into nominal contracts such as wage contracts. It is hard to think of a reason why central banks should not be able to observe wages or similar variables. Many inflation forecasts formed outside the central bank stem from research institutes which make their predictions publicly available. Hence, the validity of the results of Tarkka and Mayes (1999) seems restricted.

If a central bank is not completely independent and an inflation-prone government might interfere with its decisions, then opacity might be a useful means to protect the central bank from being overruled by the government. This is the intuition for Geraats (2002b). She assumes that the government can override the decisions of the central bank at some fixed cost.[19] If the central bank does not publish private information on velocity shocks, the government, which would like to boost output above the natural level, does not know when to intervene. This increases the effective independence of the central bank, which means that the central bank can choose its instrument from a larger range without government interference. Consequently, secrecy may lower the inflation bias and thus in turn social losses.

Apart from the reasoning given by formal models, there are also some verbal arguments in favor of or against the publication of inflation forecasts which I will briefly review. Buiter (1999) suggested that the publication of inflation forecasts would allow market participants a more informed view about the performance of the ECB council. At that time, the ECB was not ready to fulfill the request to regularly publish inflation forecasts.[20] The decision was justified by the following arguments: As Issing (1999) notes, the Eurosystem should not be judged on the accuracy of its internal forecasts. He points out that the role of forecasts is quite different and less ambitious in the ECB compared to inflation-targeting central banks. Therefore, a publication would be misleading since the public would attach a significance to the forecast which would not conform with the minor role it plays in the monetary-policy-making process.

Remsperger and Worms (1999) are of a view similar to Issing (1999), claiming that especially in the start-up phase of the Euro, discretional intervention is inevitable in the economic models of the ECB to incorporate expected structural

[18] Alternatively the central bank can publish its inflation target.

[19] The idea of central-bank decisions being overridden by the government at some costs can also be found in *Eijffinger* and *Hoeberichts* (2000). They obtain similar conclusions like *Geraats* (2002b). In their paper, transparency is identified with the variance of the normal distribution from which the inflation target of the central bank is drawn.

[20] Now the ECB publishes this information on a biannual basis.

changes. Assumptions being necessary regarding exogenous variables, the forecasts are inherently opaque and their relevance for monetary policy is constrained. The public could also misinterpret the inflation forecast since it may not understand the contingency on an assumption about future monetary-policy interventions.[21] It may, however, seem doubtful whether the public actually cannot grasp the contingency of forecasts, especially when the central bank carefully explains under which assumptions the forecasts are formed. In addition, the relevant public in this case comprises mainly financial-market participants, who are familiar with highly sophisticated financial-market instruments having a complex contingent structure of payments. But the argument that there is no need to publicize an inflation forecast which does not play an important role in decision-making has some merits. After all, I (along with other authors) have associated transparency with the dissemination of information *relevant* to the policy-making process.[22]

I now attempt an overall conclusion about the merits of knowledge transparency. Some models predict that, by making it easier for the public to identify intended policy outcomes, knowledge transparency can help central banks to commit to low inflation if the central banks are tempted to boost output above the long-run sustainable level.[23] This effect is rather robust across different models and might be a reason why central banks without a very good performance of low-inflation history would be well-advised to adopt more knowledge transparency. Examples might include the Bank of England or the Reserve Bank of New Zealand; both had an unsatisfactory history of comparably high inflation and adopted inflation targeting and a high degree of transparency in order to commit the central bank to low inflation. This seems to be in line with empirical investigations by Chortareas, Stasavage, and Sterne (2001) and Cecchetti and Krause (2002), who show that central banks that publish more forward-looking information enjoy lower inflation rates.

Another strand of the literature concludes that transparency may be bad for the central bank or for society when it is desirable that the central bank can influence output through monetary policy surprises.[24] Although this literature is certainly interesting, there are also some possible objections. First, surprises are beneficial to society if the central bank has superior information about real shocks (Gersbach 1998; Cukierman 2001), which, however, seems less likely than superior information about monetary shocks. Moreover, one has to take into account that in order for inflationary surprises to be beneficial, the central

[21] E.g., the Bank of England publishes the inflation forecast assuming constant short-term interest rates. If the inflation forecast is above target, economic agents might expect high inflation rates. This may not be correct since the central bank will react with increases in short-term interest rates and thus will reduce future inflation below the forecasted value.

[22] Obviously, some critics assume implicitly that the ECB's inflation forecasts do play an important role. This describes a dilemma for central banks. If the observers believes that relevant information is withheld, the central bank can hardly prove the opposite.

[23] This effect occurs in *Faust* and *Svensson* (2001); *Jensen* (2002); *Geraats* (2000; 2001).

[24] This effect occurs in *Cukierman* and *Meltzer* (1986) and *Lewis* (1991) where the society's or central bank's preferences for the employment goal change. In *Gersbach* (1998) and *Cukierman* (2001), shocks may move output away from its target.

bank needs information approximately one year in advance, the period which roughly represents the lags with which monetary policy is usually thought to have an effect on output. Alternatively, surprises may be beneficial if the central bank knows that the public would like to be surprised but the public is unaware of it.[25] This does not seem very plausible. Second, one might wonder whether output stabilization is indeed beneficial. In Real-Business Cycles models, e.g., it would be clearly detrimental as the Pareto-efficient output varies over time. Third, one might doubt whether the Phillips-curve mechanism is an appropriate description of the monetary transmission mechanism or the only way the central bank can affect output.

Another aspect is that knowledge transparency may foster the dialogue between outside academics and the central bank, thereby improving models and forecasts used inside the central bank. This might in the long run lead to more efficient monetary-policy making. A potential drawback of knowledge transparency occurs in New Keynesian frameworks, where transparency may lead to inefficient output stabilization (Jensen 2000; 2002) or large interest-rate changes (Cukierman 2001). By contrast, in a more conventional model Geraats (2001) obtains that transparency leads to *improved* stabilization of shocks and thus more flexibility but at the same time causes higher interest rate variability. To conclude, the costs of short-term interest rate variability should be examined more carefully in order to be able to evaluate the importance of these effects. Whether transparency hinders or improves the flexibility to respond optimally to shocks seems not satisfactorily clarified yet.

Overall, one might advocate knowledge transparency if building a reputation for low-inflation policy is an important issue. When the time-inconsistency problem plays no major role, transparency about economic data may be less important from an economic viewpoint but nevertheless may be desirable for political reasons.[26] With respect to the ECB, it may be recommendable to issue forecasts of inflation and other economic variables and publish details about the models used to generate these forecasts. Recently the ECB moved gradually in this direction as it started to publish macroeconomic projections on a biannual basis in December 2000. These macroeconomic projections include forecasts of real GDP growth and inflation over a two-year horizon. Nevertheless, the forecasts have been criticized for being too imprecise to be of any use and for being the staff's forecast and not the Governing Council's forecast (Blinder et al. 2001).

[25] See *Lewis* (1991). *Cukierman* and *Meltzer* (1986) do not reach a normative conclusion.

[26] Nevertheless there are sometimes limits to transparency if information is confidential, e.g., information from private communications with other central banks, governments or international institutions such as the IMF (see *Blinder* et al. 2001). Also information from banking supervision that is available to some central banks must be kept secret.

## 3. Operational Transparency

### *Short-term Interest Rate Targets*

Decisions of the central bank council may take several forms, two of them are discussed in the literature about transparency of central banks, namely decisions on short-term interest rate targets or money growth targets and foreign exchange market interventions. The literature on the publication of short-term interest rate targets is dominated by the discussion about the behavior of the Fed. This discussion was ignited by a court trial, which forced the Federal Open Market Committee (FOMC) to justify the delay of 90 days for the publication of the Directive, which included short-term objectives for FFR[27] tolerance ranges and money-stock growth. The FOMC refused to publicize the Directive immediately and ultimately won the case. One of the main reasons for concern about transparency was that it would lead to an increase in interest rate variability as markets would react sharply to announcements of short-run targets.[28] With hindsight, it is interesting to note that in 1994, the FOMC decided voluntarily to publish the FFR target directly after the meetings, which represents a complete reversal of opinion. Since the literature on this aspect of transparency tried to describe the monetary framework used by the Fed at that time, it is difficult to draw any conclusions for other central banks from the discussion. The discussion on the publication of short-term interest rate objectives and money growth targets is interesting in its own right, but less relevant for central banks today.

In a classic paper Goodfriend (1986) surveys the literature on transparency available at that time and reviews the arguments given by the FOMC in support of secrecy. He dismisses several arguments of the FOMC as implausible and requires further research about the validity of some arguments. As mentioned above, one controversial topic of the debate on the publication of the Directive was the question of whether transparency would lead to more variability in interest rates. To answer this, Dotsey (1987) proposes a model where the Fed is assumed to follow a feedback rule that links the supply of non-borrowed reserves with the deviation of money demand from a monetary target. The monetary target is private information of the Fed and affected by policy shocks. The Fed's monetary target is published under transparency, but remains secret under opacity. He shows that the conditional variance, i.e., the forecasting error of banks for the future FFR given their knowledge of all past variables and the present FFR, decreases if the short-term monetary target is publicized. This is rather plausible as better informed banks should produce better forecasts. For banks the disclosure of the Fed's monetary target is beneficial for two reasons. First, it reduces the costs of information collection. Second, it improves the banks' information set, leading to better decisions.

The unconditional, i.e., ex ante variance of the FFR, however, is generally higher under transparency. The unconditional variance is affected through two

[27] The Federal Funds Rate (FFR) is the over-night interest rate for reserves on the US inter-bank market.

[28] As *Greenspan* (2002) notes policy-makers were also concerned that being too explicit about short-term targets would make it more difficult to achieve the target rate.

channels. First, under transparency, the FFR responds more vigorously to changes in the monetary target, because the public is better informed about these changes. The second channel involves that borrowing responds less to policy shocks when banks are better informed. This reduces the variability of borrowing, which lowers the FFR variance. Overall, the unconditional variance of the FFR will most likely be increased by the publication of information about policy shocks for reasonable parameter values. However, it has not been satisfactorily clarified what the benefits of a low interest rate variance are if simultaneously the forecasting error of financial intermediaries, i.e., the conditional variance, is comparably large. Thus, it is hard to draw a normative conclusion from Dotsey (1987). It would also be interesting to know how results would be affected by different operating procedures. Perhaps the Fed could change to a better procedure if it had to release private information since the optimal procedure may depend on the level of transparency.

Rudin (1988) examines a model that is very similar to Dotsey (1987), but considers different degrees of transparency associated with different costs of Fed watching. The lower the fixed costs of Fed watching are, the larger is the fraction of market participants that invest in Fed watching. For the polar cases where all banks are informed or all banks are uninformed, the same results hold as in Dotsey (1987). For marginal increases of the fraction of informed banks, i.e., marginal decreases of the costs of Fed watching, the banks already informed are worse off since they do not gain new information and are harmed by the larger unconditional variance of interest rates. The larger variability of interest rates also affects uninformed banks, but they profit from the more precise information that can be derived from the FFR. Whether the overall effect for uninformed banks is positive or negative is unclear, yet for marginal increases of transparency all market participants including the central bank may be worse off. Another paper in the spirit of Dotsey (1987) has been written by Cosimano and van Huyck (1993). It reaches very similar conclusions.

Tabellini (1987) presents a model that deserves attention, since he contradicts the aforementioned papers when concluding that the variability of interest rates is lower under transparency. The model is similar to Dotsey (1987) and Rudin (1988), but the monetary objective is constant over the period of time between FOMC meetings. Then, for the interim periods, monetary-policy actions under secrecy give rise to parameter learning, i.e., Bayesian updating. If the present FFR is positively affected by expectations of future FFR, which results from increasing marginal costs of discount-window borrowing[29], then the variability of interest rates is higher under opacity. The author gives the following intuition for this result. Assume a positive shock to the demand for reserves raises the FFR, then banks will assume that the central bank possibly has a lower target for nonborrowed reserves than they previously thought and therefore they will expect future FFRs to increase as well. Then they reduce borrowed reserves today due

[29] Banks can borrow limited amounts of reserves from the Fed at the discount window. The associated interest rate is the discount rate. There are implicit costs of discount-window borrowing for banks, often associated with ‘oral suasion’ by the Fed, implying that the FFR is usually larger than the interest rate charged on discount-window borrowing (*Woodford* 2000).

to increasing marginal costs of discount-window borrowing, which puts further upward pressure on the current equilibrium value of the FFR.

Overall one might conclude from the theoretical literature on the relation between transparency and the variability of interest rates we have discussed in this section that secrecy reduces interest-rate variability if the monetary target changes very often. But secrecy lowers interest-rate variability if the objective does not vary for some time and banks constantly update their beliefs about the monetary target. As we have already discussed, it is hard to draw a normative conclusion from these models since the relative size of the costs and benefits of the potentially larger interest-rate variability and of the costs and benefits of the reduced forecasting error of financial-market participants are not clear.

### *Foreign Exchange Market Interventions*

Many academics and central bankers argue that some degree of secrecy is desirable in exchange-rate interventions (Blinder et al. 2001). According to this conviction, foreign exchange market interventions are more effective if the central bank sometimes catches market participants by surprise, which enables the central bank to inflict losses on them. Duisenberg has been criticized harshly by financial-market analysts for saying too much when he admitted that he thought it unlikely that central banks including the ECB would engage in strengthening the Euro exchange rate if it should continue to fall.[30]

To my knowledge, the only paper justifying secrecy in the foreign exchange market is Ghosh (2002). The following assumptions are crucial to his findings. First, the central bank is assumed to have superior knowledge on monetary shocks. If this assumption did not hold, the public could always foresee the central bank' actions from the size of economic variables and the central bank's loss function. Second, prices are sticky and are determined one period ahead. Third, the central bank wants to economize on foreign exchange market interventions, as massive interventions could create large losses. Fourth, the central bank cannot use money supply to stabilize money demand shocks, since money supply is used to target some other objective. Fifth, sterilized interventions affect the exchange rate through a portfolio balance channel.

The central bank faces a trade-off with respect to the revelation of its private information on money demand. If it releases too much information, then the exchange rate will adjust promptly (adjustment cannot work through the price level as prices are sticky). This stabilizes next period's output at the expense of an increased variance of today's output. If, in contrast, the central bank could entirely withhold information on money demand shocks, then today's output would be stable, but future output would vary greatly. The optimal solution to this trade-off corresponds to a partial dissemination of information, which can be achieved by secret interventions. Since, in addition to the central bank, there are noise-traders operating in the foreign exchange market and the public can only observe the total amount traded, the public receives only a noisy signal of the se-

[30] See The Financial Times, October 17, 2000.

cret interventions which the central bank has carried out. Thus, by using secret exchange market interventions, the central bank can commit to a mechanism of disseminating private information only partially.[31] To summarize, foreign exchange-market interventions seem to be one of the few areas where some degree of secrecy seems desirable. However, empirical research indicates that sterilized interventions usually do not have a strong impact (or even no impact at all) (Dominguez and Frankel 1993).

### *Voting Records*

The debate by Buiter (1999) and Issing (1999) on the transparency of the ECB has stirred the question of whether the voting records of the Governing Council, which is the highest decision-making body of the ECB and sets the ECB's instruments, should be published.[32] In principle, the publication of voting records could be beneficial if voting records contain information relevant to financial markets or the public in general, e.g. on the future course of monetary policy (Buiter 1999). But if financial markets cannot use this information efficiently, then voting records may be confusing and, e.g., raise the volatility of interest rates or other asset prices.[33] Whether one favors the publication of voting records, thus inter alia depends on one's conviction about the efficiency of information processing of economic agents. However, the publication of voting records may not only reveal information to the public, but may also influence the behavior of central bankers or of those who appoint them.[34] As we will see it is unclear whether these effects are desirable.

It is the concern of Issing (1999) that national political authorities would be able to put more pressure on the members of the Governing Council if voting records were published.[35] Buiter (1999) strongly disagrees. He even thinks that national political authorities are able to put more pressure on members if voting records are not published, arguing that due to unavoidable leaks the national political authorities will know the voting behavior of central bankers no matter

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[31] The model could also be used to establish the desirability of secrecy with respect to money demand shocks. The beneficial impact of opaque interventions in the foreign exchange market would disappear if the public were aware of the size of the money demand shock. In particular, it could be possible for market participants to infer this information from the central bank's setting of the money supply, which would make the mechanism identified by the article ineffective.

[32] Most of our discussion can also be applied to other central banks. However, the arguments presented here are of course irrelevant for central banks where only one individual is responsible for monetary policy, e.g., the Reserve Bank of New Zealand where the governor alone is responsible for setting interest rates.

[33] *Issing* (1999) claims that the excessive focus on personalities complicates the public's signal extraction problem.

[34] According to *Buiter* (1999), individual responsibility implies that individual competence can be assessed. This is important for re-appointments and for further employment of former central bankers outside the central bank. The models presented in *Gersbach* and *Hahn* (2001b) and *Gersbach* and *Hahn* (2001a) take this into account.

[35] *Remsperger* and *Worms* (1999) have a similar view, expressing their concerns that the publication of voting records would reduce the efficiency of monetary policy.

whether it is published officially or not. But this information will not be formally available to bodies charged with supervising the ESCB. However, I do not think that this argument by Buiter (1999) is very plausible, since it relies on the assumption that bodies charged with supervising the ECB, which have no legal possibility of sanctioning central bankers, need formally available and verifiable information to put pressure on the ECB, whereas it is sufficient for national political authorities to have informal information to put pressure on central bankers.

As noted by Cukierman (2001), the publication of voting records does not necessarily induce members to vote more strongly in the interest of their countries. It could equally well be possible that central bankers do not wish to be detected pursuing a nationally oriented monetary policy. Whether the publication of voting records leads to more "European" oriented voting behavior or not depends on whether the position central bankers aspire after their office at the central bank is in a European institution or in a national institution.[36]

While it is less likely that the six members of the Executive Board, who are in addition part of the Governing Council, face serious national political pressure, since they are not accountable to any national institution and their term in office is not renewable, it is well conceivable for the twelve governors of the NCBs, who are also members of the Governing Council, that the case is different.[37] Governors of the NCBs are highly independent as it is forbidden for national or European institutions to seek to influence them, their term in office must be at least five years and they cannot be relieved under usual circumstances. Nevertheless, they may face national pressure under transparency if economic conditions or preferences about monetary policy are very different across countries. In particular at the end of their office, national governors may try to satisfy national authorities in order to be re-appointed or in order to get other prestigious positions.

Whilst he thinks that costs of voting transparency are likely, Issing (1999) also asserts that the potential benefits from publishing voting records are rather small. The publication of the voting records is not sufficient for substantive individual accountability without the publication of arguments, underlying assumptions et cetera. And the validity of dissenting views cannot be assessed even ex post. Empirical literature, however, seems to indicate that the release of voting records (and minutes) by the Bank of England has an informational value for financial markets and thus might involve benefits (Clare and Courtenay 2000; Gerlach-Kristen 2001).

This seems to support Buiter (1999), who states that voting transparency is important because it reveals to the public the amount of disagreement in the central-bank council. Why could the amount of disagreement be of significance to public? First, if the amount of disagreement is correlated with the amount of

[36] *Cukierman* (2001) nevertheless expresses his concerns that, when votes are published, decisions depend more on political and personal considerations and less on professional considerations. The model presented *Gersbach* and *Hahn* (2001a) allows similar conclusions.

[37] *Meade* and *Sheets* (2002) show that the voting behavior of FOMC members seems to be regionally biased. Astonishingly, this regional bias is stronger for central bankers without explicit regional affiliation, which would correspond to the members of the Executive Board.

uncertainty central bankers expect for economic conditions, then financial-market participants may learn something about the riskiness of economic conditions from the voting records. Second, if the majority for a certain proposal is rather small, the interest rate that a large minority has voted for may be comparably likely to be adopted in the next meeting of the council (also Gerlach-Kristen 2001). E.g., if a large minority is in favor of interest-rate cuts, but the majority wants to leave interest rates unchanged at the present state, then interest-rate cuts may be more likely than increases in interest rates in the near future. As a consequence, the publication of voting records may inform the public about likely future interest rate changes, thus making monetary policy more predictable. However, one might doubt whether the publication of voting records is the only way to reveal the above-mentioned pieces of information to the public. E.g., the likely stance of future monetary policy could also be revealed in the form of a "monetary policy bias", which is a procedure that has been adopted by the Fed.

It is well-known that central banks can alleviate the time-inconsistency problem by building a reputation for keeping inflation low. Then, central bankers refrain from choosing expansionary policy as this would involve large losses from losing their reputation. If one recognizes that in many central banks decisions are made by a committee, one might ask how the publication of individual voting records changes the incentives for building reputation. This question is tackled by Sibert (1999), who presents a model of overlapping generations of central bankers. In each period, the central-bank council comprises one old and one young central banker. Central bankers can either be hawks or doves; their type is private information. Hawks, in contrast to doves, do not want to surprise-inflate. The author shows the following: In their second term in office, doves always choose a high inflation rate, no matter whether votes are published or not. However, it may be profitable for doves in their first period in office to appear as hawks by voting for low inflation. This reduces inflation expectations for the next period and enables doves to boost output in the next period. The incentives for doves to vote for low-inflation policy when they are young are larger under transparency since the public can more easily assess how the young central banker has voted. Under opacity, these incentives are lower since there is a chance that a young central banker's vote for a low interest rate is attributed to the old central banker. Hence transparency increases incentives for doves to vote for low inflation in their first period in office, which is beneficial as it yields a lower inflation bias.[38]

While according to Sibert (1999) the publication of individual votes has an impact on the public's inflation expectations and on the voting behavior of central

[38] The formal analysis has two formal problems, which, however, probably could be remedied without changing the conclusions of the paper. The assumption that hawks always vote for low inflation is not motivated by their loss function but simply assumed as hawks vote for low inflation even if this makes them worse-off. Another problem stems from the assumption that the average of the two interest rates for which the central bankers have voted is adopted. Given this assumption and dissenting interests in the central-bank council, it is definitely not optimal for both central bankers to vote for the interest rate that they individually estimate to be optimal. In this model with incentives to vote strategically even the existence of an equilibrium cannot be guaranteed.

bankers, transparency may also have a significant impact on the re-appointment process and thus in turn on the behavior of central bankers aspiring re-election. In this case, transparency may change both the average composition of the council and the voting behavior of its members. In this context, Gersbach and Hahn (2001b) and Gersbach and Hahn (2001a) present formal models to assess whether voting transparency or the opacity of voting records yield lower social losses. Gersbach and Hahn (2001b) show that transparency may be harmful if central bankers differ in their efficiency to identify shocks in the economy. Their individual voting behavior being published, less efficient central bankers try to imitate highly efficient central bankers under transparency in order to appear efficient and thus be re-elected. This is socially inefficient and reduces the likelihood of beneficial monetary policy. Overall, despite the advantage of transparency of revealing inefficiencies a bit more successfully than opacity, transparency may yield higher social losses.

Gersbach and Hahn (2001a) assume that central bankers differ in preferences. It is shown that voting strategically in order to be re-elected and to be able to influence future monetary policy is not optimal for central bankers with preferences differing from those of the public. Enabling the government to re-elect only individuals with favorable voting behavior, transparency increases the likelihood of the central bank choosing monetary policy that conforms with social preferences.

There are some complementary arguments in favor of or against the publication of voting records. If the central bankers' competence is endogenous and central bankers can affect their probability of being informed by choosing more or less effort, then transparency is most likely to be beneficial, because the individual competence of single members can be assessed more easily. This should increase incentives to invest in effort, thereby increasing the competence of central bankers. Under opacity, there are incentives to free-ride on other central bankers' effort. This should be especially significant if the council is very large as with the ECB, where the Governing Council at the moment comprises 18 members.

Although being not very competent, central bankers may be appointed for political reasons. Politicians may be tempted to nominate friends or members of their own political party. If the central bankers' individual competence could be assessed, appointments of less efficient candidates would occur more seldom since politicians would dislike being detected as appointing candidates merely due to personal relationships. It is also conceivable that less efficient candidates might not strive for a position on the central bank council, since they want to avoid the embarrassment of being detected as less efficient. Hence the transparency of voting records could have a beneficial impact.

Under transparency the desire of central bankers to appear competent in every decision and in every topic might deter socially beneficial specialization. E.g., a central banker who could specialize in lender-of-last-resort policy might be concerned to appear as less competent if his special knowledge were not needed at the moment. The deterioration of specialization could be detrimental to welfare.

Overall, balancing the positive and negative effects of voting transparency, one might cautiously advocate the publication of attributed voting records. Voting transparency is beneficial if central bankers may have preferences differing from those of the public. In addition, transparency may increase incentives to appoint highly efficient central bankers. And finally, it may also induce central bankers to invest more effort into becoming more competent. Nevertheless there remains a significant concern that under voting transparency central bankers focus too much on appearing as competent individuals and less on the overall outcome. It is interesting to note that in the last years many influential central banks decided to publish voting records. E.g., the Federal Reserve, the Bank of Japan, and the Bank of England publish voting records after several weeks, providing full details of individuals' votes (Blinder et al. 2001). Thus the traditional reservations of central bankers about operational transparency seem to be shrinking.

For the time being, voting transparency cannot be advised for the ECB since the danger that governors of NCBs face political heat from their nations seems severe. However, it appears rather likely that at some point in time the composition of the Governing Council will be changed. As more countries become members of the EMU (European Monetary Union), the size of the council is constantly increasing since all governors of the NCBs are members of the Governing Council. Since its initial meeting it has already grown from 17 to 18 members as Greece joined the EMU at the beginning of 2001. If, in the future, a restructuring takes place such that national governors are no longer part of the Governing Council, then the issue of publishing voting records should be reconsidered.

### *Minutes of the Meeting*

Another aspect of the debate about operational transparency concerns the publication of the minutes of the meetings of the decision-making bodies. Buiter (1999) demands the ECB to make the minutes available on a non-attributed basis, as attributed opinions would prevent open-minded discussions. In his view the minutes should be published because all information should automatically be in the public domain. Issing[39] claims that to publish as much as possible does not necessarily improve the public's understanding. The public can never be sure that no information is withheld and no motives are hidden (also Remsperger and Worms 1999). Issing (1999) argues that the ECB President's monthly press conferences immediately after the meetings come very close to providing "summary minutes".

Overall, one might advocate the publication of a summary of the meetings in the future. This may be similar to the introductory statement given at the press conference held by the President of the ECB immediately after the meetings, but should be more detailed and should also refer to dissenting opinions. An immediate non-edited publication of the minutes on an attributed basis might deter open-minded discussion in the central-bank council and might lead to costly

[39] Quoted in *Buiter* (1999).

substitution when central-bankers circumvent transparency requirements. If voting records are published (which, however, as detailed above does not seem recommendable for the ECB at the present state), then one could also publish statements of individual council members, giving them a forum for justifying their decisions. This may enhance the public's understanding of dissenting views as well as make it easier to evaluate their validity ex post. It also may foster the debate between central bankers and economists outside the central bank. However, it does not seem altogether unreasonable that the ECB as a relatively new institution under the conditions of a multi-national monetary union prioritizes the development of a common culture and common view on monetary policy and thus is reticent about the publication of individual views for the time being (Issing 1999).

## III. Summary and Open Issues

Traditionally, central banks were relatively secretive, releasing information only if they thought this would enhance policy-making. The new paradigm of transparency in monetary policy lays down the premise that all information should be in the public domain, unless there are important reasons to withhold it (Buiter 1999; Blinder et al. 2001). If we adopt this starting-point, we still find some areas where we can rejoice transparency on good grounds. These exceptions to the general rule of transparency include information on banking supervision and on the likelihood of financial distress, which could create self-fulfilling expectations and might precipitate a crisis. While for many central banks the publication of voting records can be cautiously encouraged, this step cannot be recommended for the ECB Council due to its special structure. Moreover, with respect to other central banks one has to keep in mind that the publication of voting records might change the voting behavior of central bankers who may be tempted to use their votes as signals of certain preferences or degrees of competence. The immediate publication of verbatim minutes would deter open-minded discussion and induce central bankers to present prepared statements only. Thus minutes should be released in an edited and more stylized form. Verbatim minutes with attributed statements of central bankers should only be published with a delay of several years, which is current practice of several central banks.

An aspect of transparency that has not received much attention concerns foreign exchange rate interventions. Many academics and policy-makers hold that sterilized interventions may be more effective if they are pursued in secret. As there is only one theoretical model elucidating welfare implications of secrecy in the foreign exchange market, more effort in this direction is clearly desirable. For the time being, one might recommend that central banks should be reticent about such interventions. While in the past policy-makers and academics had reservations about the announcement of short-run targets of the FOMC, these concerns seem to have proved unsubstantial as the FOMC decided to publish its decisions several years ago without the expected detrimental effects.

Knowledge transparency is a useful means of building credibility for central banks without a track record of low inflation. This view is supported by empirical research which shows that on average central banks that publish more forward-

looking data appear to be more successful in achieving low inflation rates. The benefits of knowledge transparency for central banks that already enjoy low inflation rates and a high degree of credibility are less clear. Potential drawbacks of transparency identified by the theoretical literature include a larger variability of interest rates and the inability to respond to shocks, because surprises are thought necessary to influence output. These findings are highly model-specific and more research in this direction seems advisable in order to obtain more robust conclusions. Since transparency works through the public's expectations, the role of expectations for the monetary transmission process is of crucial importance for the impact of transparency on macroeconomic variables and thereby also for our conclusions about the merits or disadvantages of transparency from a social perspective. Since present economic variables depend more strongly on expectations in forward-looking New Keynesian models, it is not surprising that forward-looking models arrive at different conclusions compared to more conventional models where the expectations play a less dominant role. In forward-looking models, transparency may be detrimental since policy intentions for the future influence expectations and thus in turn distort present economic variables. Without a consensus about the monetary transmission mechanism, in particular about the role of expectations in this process, theoretical models can give no clear answer about the desirability of knowledge transparency. Thus, more empirical research on the consequences of transparency for the variance of interest rates[40] and output stability is advisable. Nevertheless, the consensus view is that knowledge transparency is beneficial or at least not detrimental. Empirical research seems to support the view that knowledge transparency does not lead to a larger variance of output (Chortareas, Stasavage, and Sterne 2001), but more data must become available in order to get an accurate picture of the potential consequences of knowledge transparency for output variance.

The case for goal transparency is rather clear in practice. According to the consensus view central banks should aim at price stability. Many central banks have also specified numerical targets for inflation.[41] The theoretical literature on goal transparency is a rather new branch of the transparency literature. Although some papers find that transparency may be beneficial, e.g., because more transparency leads to more accurate inflation expectations and thus a more stable output, there are also some papers arguing that the secrecy of objectives might involve some benefits, e.g., since it deters excessive wage setting of unions, and thus leads to higher employment and lower inflation. Again, the choice of the model and the exact specification of the information asymmetries seem to be crucial to the welfare implications.

Present papers mainly consider single aspects of transparency in isolation. An ambitious but promising task would be to model the interaction between different dimensions of transparency simultaneously. It is well conceivable, e.g., that transparency in one field affects the impact of transparency with respect to other

[40] *Chadha* and *Nolan* (2001) show that the volatility of the interest-rate process has increased in the UK since the Bank of England was made independent. But they argue this cannot be attributed to increased transparency.

[41] We do not consider central banks with fixed exchange rates in this survey.

variables. One might also require more models with a solid microeconomic foundation, since the structural equations of macro models may not be invariant to different transparency regimes.

Nowadays, most central banks strive for more transparency. However, transparency cannot be achieved by publishing information only. An important prerequisite for transparency is understanding on behalf of the public. To some extent, this explains why the ECB is perceived as opaque by some commentators, although the ECB arguably publishes more information than e.g. the Bundesbank published before the introduction of the Euro.[42] The ECB's observers simply do not have enough experience with this relatively new institution to interpret its behavior accurately (Bini-Smaghi and Gros 2001). This illustrates why central banks which cannot be judged from experience about their monetary policy must put more effort into becoming transparent than renowned institutions.

## Summary

In this paper we provide an overview over the literature on transparency in monetary policy. We distinguish between three types of transparency, namely goal transparency, knowledge transparency and operational transparency. Goal transparency may seem desirable from a political viewpoint and there are also some economic arguments in favor of it. Knowledge transparency seems to be especially important if the central bank does not have a very good reputation for being tough on inflation since it deters central banks' attempts to surprise-inflate. The conclusions about operational transparency are mixed and further research is desirable. Nevertheless, in a multi-national environment such as the ESCB, it seems not unreasonable to withhold voting records at the present time.

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[42] Another problem is that the ECB Council's members differ extremely in their experience and background. This complicates communication in a multi-national institution.

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