Why Are Federal Central Bankers Less Conservative?

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Preliminary Version, not for citation

Abstract

This paper analyzes monetary policy making by a committee of regional representatives in a currency union with asymmetric shocks. By considering strategic delegation of monetary policy making, we show that regional representatives are less conservative than the average citizen in their district. The theoretical model in this paper can explain the recent empirical finding that FOMC members as a group on average are more expansionist than members of the board.
1 Introduction

Recent empirical research on the voting behavior of regional central bankers in the Federal Open Market Committee (FOMC) shows that their policy preferences differ from those of the Fed board. A first consistent finding is that regional FOMC members as a group are more expansionist than board members (Havrilesky and Gildea (1995), Meade and Sheets (2002), and Chappell et al. (2005)). In addition, for individual governors dissenting voting behavior from the board is explained when regional economic conditions systematically differ from the national situation. However, as local conditions add up to the overall economic situation, this last finding does not explain the group bias towards a more expansionist policy. For the Euro area, Heinemann and Hufner (2002) offer some preliminary evidence that the interest rate policy of the ECB is best explained by the economic conditions in the median member state and not by the output gap for the EMU members states as a whole. This may signal that ECB policies to some extend reflect bargaining among the national central banks.

In this paper, with the help of a theoretical model, we explain the systematic group bias of regional central bank governors towards a more expansionist monetary policy. Our starting point is De Grauwe (2000), who argues that federal monetary policy may from an ex ante perspective be too conservative for each region. The reason is that when there are asymmetric regional shocks, the variance of the federal output gap is lower than that of the weighted sum of the individual regions. Hence, when regional policy makers anticipate that the federal central bank will evaluate policy taking account only the aggregate economic situation in the monetary union, they have an incentive to delegate policy making to a person who cares more for output stabilization when compared to decentralized policy making.

To derive this result, we use a two-country Barro-Gordon model in which policy makers face a trade off between inflation stabilization and output stabilization. In case of a supply shock, the extend to which the policy maker uses unanticipated inflation to accommodate the supply shock depends on her preference for output stabilization relative to cre-
ating inflation. It is a well known result in the optimal currency area literature that centralizing monetary policy in this setting creates inefficiencies. In this literature, to form a currency union with other countries involves a trade off between on the one the one hand the efficiency gain from a common currency in conducting bilateral trade, and on the other hand larger output fluctuations in the presence of asymmetric shocks. However, when two countries have the same variance in output shocks, it is unclear whether monetary policy will be on average too restrictive for individual countries. The innovation of De Grauwe (2000) is that he shows that the covariance of the asymmetric shocks creates a bias towards a too conservative monetary policy from the perspective of the individual members of a monetary union.

The political economy part of our model describes strategic delegation by the median voter in each of the regions. Strategic delegation of monetary policy making is well-know phenomenon since Rogoff (1985). In his paper, citizens anticipate that there will be a future bargain between the policy maker and themselves over the optimal inflation rate, where they know that the policy maker will try to surprise them. The delegation decision for a median citizen involves a trade off between on the one hand the benefits of having a more conservative central banker that come in the form of a lower anticipated inflation, and on the other hand suboptimal low output stabilization in case of asymmetric shocks. In our paper there is no output stabilization bias, so there is no reason to expect inflation when the mean value of shocks is zero. Hence, in that case, the median voter would delegate policy making to himself. To our knowledge, this paper is the first that finds strategic delegation of monetary policy making in the absence of an output stabilization bias.

The regional commitment to a federal monetary policy stance serves to influence the decisions of a committee that decides on a common monetary policy. This set up is close to Besley and Coate (2003), where two regions bargain over the centralized supply of local public goods. They show that, in the presence of a common pool problem, the median voter has an incentive to delegate to a person which a higher preference for the local public good, so as to obtain a larger share of centralized spending.
In contrast to our paper, their result applies in the situation where local public goods can be differentiated across regions. With monetary policy there is no scope for differentiation, for a federal central bank decides on a common interest rate for the monetary union. The reason for delegation in our paper is that in the absence of an inflation bias, the median voter has an incentive to correct the conservative bias in the common average interest rate. In the symmetric equilibrium both countries delegate to a less conservative representative, which counterbalances the conservative stance of the centralized policy committee.\footnote{There is a increased interest in decision making in committees in general (see e.g. Swank and Visser (2005)) and monetary policy making committees in particular (Blinder (2004)). These authors analyze decision making when members care for their reputation. Our paper abstracts for these incentives to preserve or build reputation as well as from other obstacles to efficient decision making in committees.}

The paper proceeds as follows. In the next section, we set up the model and derive optimal decentralized and centralized policy when the median voters are policy makers. Then, in Section 3, we introduce strategic delegation under various decision making rules in the committee. In Section 4 we discuss some features of our model and its results for monetary policy making in the ECB.

2 The Model

We consider two countries $i = 1, 2$ in which citizens are indexed by $j$. With respect to monetary policy making, each citizen has a loss function:

$$U^j = -\lambda^j(y)^2 - (1 - \lambda^j)(\pi)^2$$ \hspace{1cm} (1)

where $\lambda$ is a parameter that measures the preference of output stabilization over inflation stabilization. This parameter has a uniform distribution over $[0, 1]$ so that the median citizen has $\lambda^m = 1/2$. In addition, $y$ is the output gap, and $\pi$ is actual inflation. The economy is described by an expectations augmented Phillips curve:

$$y = \pi - \pi^e + \varepsilon_i$$ \hspace{1cm} (2)
in which $\pi^e$ is expected inflation and $\varepsilon_i$ a supply shock. Shocks are normally distributed with mean zero. We abstract from an inflation bias so that expected inflation equals zero. This also means that when citizens can vote for a type of policy maker, then a person with the median preferences $\lambda^m$ will be selected as policy maker. Note that to keep the model as simple, we assume that the monetary authority sets the inflation rate directly. Further, in this simple set up, the Lucas supply curve that we use mirrors most recent neo-keynesian versions.

Following the literature we assume that the central banks learns the shock before the public. Hence, by creating surprise inflation/deflation the central bank is able to correct the shock. As preferences of the central bank are given when appointed, citizens are to predict the future policy stance of the central bank, for they realize that the central banker has a fixed trade of between output shocks and inflation. This trade oﬀ is described by a policy rule $\kappa$ so that:

$$\pi = \kappa \varepsilon_i$$

This optimal policy rule follows from loss minimalization by the policy maker. When we substitute $y = (1 - \kappa)\varepsilon_i$ and $\pi = \kappa \varepsilon_i$ into (1) and minimize to $\kappa$, for a person with median preferences $\lambda^m = 1/2$ we can show that $\kappa = 1/2$. Intuitively, as the policy maker at the margin cares equally for an increase in output as for a reduction in inflation, she only accommodates half of the supply shock. In expected welfare terms this means that:

$$y^2 = \left[\frac{1}{2}\varepsilon_i\right]^2 = \frac{1}{4}\sigma_i^2$$

$$\pi^2 = \left[\frac{1}{2}\varepsilon_i\right]^2 = \frac{1}{4}\sigma_i^2$$

(3)

Now, let the two countries form a monetary union with a committee of two policy makers. In addition, assume that these two policy makers have median preference and care about the output gap of the union $\varepsilon_m$. Certainly, when the policy makers are identical, this outcome mirrors the case of a single centralized policy maker, as in De Grauwe (2000).
Suppose that the countries are of equal size, so the objective function of the central bank equals (1). Further suppose that the optimal $\kappa$ now applies for the reaction to the average union-wide shock $\varepsilon_m = 1/2(\varepsilon_1 + \varepsilon_2)$. Hence, for country 1 the output gap and inflation will be:

$$y = -\frac{1}{2} \varepsilon_m + \varepsilon_1 = \frac{3}{4} \varepsilon_1 - \frac{1}{4} \varepsilon_2$$
$$\pi = \frac{1}{2} \varepsilon_m$$

When we concentrate on a positive output shock $\varepsilon_1 = 1$ we can see that that output will equal the decentralized case only when there is a perfectly symmetric shock in the other country. In welfare terms, suppose that ex ante the country variances $\sigma_i^2$ are equal. In that case:

$$\text{var}[y_i] = \frac{10}{16} \sigma_i^2 - \frac{6}{16} \text{cov}$$
$$\text{var}[\pi] = \frac{1}{4} \sigma_m^2$$

If the covariance of shocks is smaller than one, it follows that output variation will be larger in a monetary union, as shocks are to some extent asymmetric. In contrast, inflation variance will be lower than with decentralized policy making, for $\sigma_m^2 \leq \sigma_i^2$.

An alternative set up is when the median citizens in the federal committee only care for output stabilization in their own region. Suppose that the median voters decide on a policy rule $k$ at the centralized level. The optimal rule minimizes (5) so that each country would prefer the federal central bank only to consider its domestic situation. Clearly, when the regional policy makers then bargain over the rule, in the symmetric equilibrium it will be $\pi = \frac{1}{2}(\frac{1}{2} \varepsilon_1 + \frac{1}{2} \varepsilon_2) = \frac{1}{2} \varepsilon_m$ so that $\kappa = 1/2$.

In the two previous cases, a rule was not quite essential for decision making, for the median citizens could have picked their inflation rate directly each period. Suppose however, that the median voters are asked to agree on a monetary policy rule in advance that relates the federal output gap to the inflation rate: $\pi = \kappa \varepsilon_m$. When each median citizen
cares for his own output shock, joint welfare is:

\[
U_J = -\frac{1}{4} \left[ -\kappa \varepsilon_m + \varepsilon_1 \right]^2 - \frac{1}{4} \left[ -\kappa \varepsilon_m + \varepsilon_2 \right]^2 - \frac{1}{2} \left[ \kappa \varepsilon_m \right]^2
\]

Minimizing this to \( \kappa \) results in the following equilibrium policy rule:

\[
\kappa = \frac{1}{2} \frac{\varepsilon_m \varepsilon_i}{\sigma_i^2} = \frac{1}{2} \frac{\sigma_i^2}{\kappa \sigma_i^2}
\]

where the last equation sign follows when expected average output gap equals the country specific output gap. First start by noting that when shocks are perfectly symmetric, the policy rule will be \( \kappa = 1/2 \): when countries are identical there is no reason to change the decentralized policy making rule. However, when there are asymmetric shocks, in expected terms the response to shocks will be too low, as \( \sigma_i^2 < \sigma_i^2 \). Then, the median citizens desire a more expansive rule so as to accommodate this imbalance. In addition, note that when there is a very low correlation between the shocks, then \( \kappa = 1 \). In this case decision making based on the average output gap would result in a structural excessive conservativeness. Hence, each regional policy maker is prepared to accommodate this risk by selection a rather expansive rule at the cost of periods of too high inflation for local tastes.

3 Strategic delegation of monetary policy making

This section investigates the delegation decision by the median voter. The order of the events is as follows. In stage 1 the median voter selects a citizen to represent the region in the federal central bank. We assume that there is a set of candidates available to choose from and that the preferred candidate is among them. In general, we want to investigate whether the median citizen has an incentive to delegate policy to a person who has different policy preferences than that of her own. We are not interested in the question whether such a candidate is indeed available in a setting where entry of policy makers is endogenous, as in Besley and Coate (1997). Further, when multiple equilibria exist in this stage, we will consider which of them are coordination proof. The reason is that it
seems plausible that regional policy makers are able to coordinate their delegation. However, in some cases we will see that certain agreements between regional policy makers are not credible.

In stage 2, the citizens to whom policy is delegated decide on the monetary policy rule. In stage 3, which is purely technical once the rule has been decided upon, the federal central bank conducts monetary policy by choosing the inflation rate. However in this third stage, we differentiate between the case when the regional policy makers have federal preferences so that they will care for the union wide supply shock, or whether they care for the supply shock in their region. As we derive sub-game perfect equilibria by backward induction, we start with the first case where policy makers have federal preferences.

3.1 Federal policy preferences

At the federal level, each regional policy maker cares for the union-wide shock \( \varepsilon_m \) so that, when countries are of equal size, the joint loss function of the two delegates can be written as:

\[
U_f = -\frac{1}{2}(\lambda_1^p + \lambda_2^p)(y_f)^2 - \frac{1}{2}(2 - \lambda_1^p - \lambda_2^p)\pi^2
\]  

(5)

The federal output shock gap is \( y_f = (1 - \kappa)\varepsilon_m \), where \( \kappa \) is the optimal policy rule such that \( \pi = \kappa\varepsilon_m \). Substituting in (5) and minimizing the joint loss function gives the optimal policy rule:

\[
\kappa = \frac{1}{2}(\lambda_1^p + \lambda_2^p)
\]  

(6)

Clearly, the optimal response can be increased by delegation to a less conservative regional central banker. Using this we have the following results for output and inflation and their variance:

\[
y_1 = -\frac{1}{2}(\lambda_1^p + \lambda_2^p)e_m + e_1
\]

\[
\pi_1 = \frac{1}{2}(\lambda_1^p + \lambda_2^p)e_m
\]
To discuss incentives, we investigate how these variances change when the regional policy maker delegates to a more expansive regional central banker:

\[
\begin{align*}
\frac{dy_1^2}{d\lambda_1^P} &= \frac{1}{2}(\lambda_1^p + \lambda_2^p)\epsilon_m^2 - \epsilon_m \epsilon_1 \\
\frac{d\pi^2}{\lambda_1^P} &= \frac{1}{2}(\lambda_1^p + \lambda_2^p)\epsilon_m^2 > 0
\end{align*}
\]  

(7)  

(8)

Suppose for the moment that both median voters are monetary policy makers. In that case, the marginal cost of a higher output variance are lower than that of a higher inflation variance. Hence, this gives the median voter an incentive to delegate policy making. We can use (7) and (8) to solve the first-order conditions for the median citizens in the first stage:

\[
\frac{\partial U^m_i}{\partial \lambda_i^P} = -\frac{1}{2} \frac{dy_1^2}{d\lambda_1^P} - \frac{1}{2} \frac{d\pi^2}{\lambda_i^P} = 0
\]

By inserting (7) and (8) it follows that in the symmetric equilibrium the preferences of the policy maker are described by:

\[
\lambda_i^P = \frac{1}{2} \frac{\epsilon_m \epsilon_i}{\sigma_m^2}
\]

(9)

In the following we define the expected product of the average and the individual country shock as \( \theta = \epsilon_m \epsilon_i \). The condition under which the median voter delegates to a citizen who cares more for output shocks than herself is:

\[
\epsilon_m \epsilon_i > \sigma_m^2
\]

(10)

To discuss this result, let us start with the benchmark case of perfectly symmetric shocks. Then, \( \epsilon_m = \epsilon_i \) so that \( \lambda_i^P = 1/2 \): the policy maker delegates to a regional central banker with preferences similar to that of
her own. Clearly, national and region interests are perfectly aligned so there is no reason for delegation. When there are asymmetric shocks, $\sigma_m^2$ declines because of the covariance of the shocks. As there is no reason to think ex ante that the sum of $\varepsilon_m \varepsilon_i$ will fall, the policy maker delegates to a less conservative regional central banker. Even stronger, in expected terms the regional policy maker may consider the average and the region specific shock as identical so that $\theta = \varepsilon_m \varepsilon_i = \sigma_i^2$. The regional policy maker would like the federal central bank to be more expansive. The way to achieve this is to delegate to a regional central banker who is more expansionist than the average citizen.

### 3.2 Regional policy preferences

In this sub-section we consider the contrasting case where regional central bankers care only for local conditions. We start by assuming that the central bankers have to agree on a policy rule that takes into account the average output gap $\pi = \kappa (\varepsilon_1 + \varepsilon_2) / 2 = \kappa \varepsilon_m$. Alternatively, below we also analyze a pure fighting equilibrium where $p = \frac{1}{2} [\lambda_1^p \varepsilon_1 + \lambda_2^p \varepsilon_2]$ in each period. By choosing $\kappa$, the regional central bankers minimize their joint loss function

$$U^c = \frac{1}{2} \left[ -\lambda_1^p (y_1)^2 + (1 - \lambda_1^p) (\pi)^2 \right] + \frac{1}{2} \left[ -\lambda_2^p (y_2)^2 + (1 - \lambda_2^p) (\pi)^2 \right]$$  \(11\)

where $y_i = -\kappa \varepsilon_m + \varepsilon_i$. From the first-order condition it follows that:

$$\kappa(\lambda_1^p, \lambda_2^p) = \frac{\lambda_1^p + \lambda_2^p}{2} \frac{\sigma_i^2}{\sigma_m^2}$$  \(12\)

Note that when the delegate has stronger preferences for output stabilization, this increases the reaction $\kappa$. However, as the delegate then cares more for federal output stabilization, she also react stronger to a shock in the other country.

In the first stage the median citizen anticipates this decision rule. She maximizes:

$$U^m_i = -\frac{1}{2} y_i^2 - \frac{1}{2} \pi^2$$  \(13\)
where given the rule adopted by the policy makers the variances of output and inflation in country 1 are:

\[ y_1^2 = \left[ -\frac{\lambda_1^p + \lambda_2^p \sigma_i^2}{2} \sigma_m^2 e_m + e_1 \right]^2 \]

\[ \pi^2 = \left[ -\frac{\lambda_1^p + \lambda_2^p \sigma_i^2}{2} \sigma_m^2 e_m \right]^2 \]

From the first-order conditions of in both regions we derive that for the average citizen:

\[ \frac{\partial U^m_i}{\partial \lambda_i^p} = \lambda_1^p + \lambda_2^p = 1 \]

In this case, multiple equilibria exist. When distinguishing between them, one may ask which would be selected when median citizens coordinate their action, hence, which one is coordination proof. Certainly, all combinations are, because each of the citizens is indifferent which of the two policy makers is the ‘dove’ and which is the ‘hawk’. However, the truthful delegation equilibrium where both median citizens delegates to a regional policy maker with similar preferences to that of her own is among them. Hence, when countries decide that regional policy makers have to formulate a monetary policy rule based on the national output gap, delegation will result in the first-best policy rule. Notice at this point by contrast the result of the previous section where regional policy makers have federal preferences. In that case, monetary policy is too restrictive.

Lastly, consider the situation where there is no rule, and each period bargaining among the delegates results in \( p = \frac{1}{2} [\lambda_1^p \varepsilon_1 + \lambda_2^p \varepsilon_2] \) and \( y = -p + e_i \). When we substitute this in (13) this results in:

\[ \frac{\partial U_i^m}{\partial \lambda_i^p} = (\lambda_i^p - 1) \sigma_1^2 + \lambda_2^p \varepsilon_1 \varepsilon_2 = 0 \]

which is strictly increasing in \( \lambda_i^p \). Again, symmetric truthful delegation is among the possible candidates. However, in this case symmetric truthful delegation is no Nash-equilibrium. The reason is that when the other
country delegates to the median citizen, welfare can be improve by delegating to a person who cares more for the regional output gap. In each round of bargaining this would improve regional welfare, as—in contrast to federal preferences—the rule can be biased towards one of the countries. This results in delegation to policy makers who care excessively for the regional output gap.

In conclusion, when regional policy makers in the federal bank adopt federal preferences, the median citizen in each region has an incentive to appoint a more expansive regional delegate to the federal central bank. This delegation is efficient in the sense that it correct the downward bias in federal policies. Second, we have shown that when the median citizens voters would set the policy rule themselves this would result in the same outcome. Hence, goal independence of the federal central bank comes at the cost of strategic delegation. In addition, when regional central bankers care for local conditions but do have to formulate a monetary strategy based on the federal output gap (as is the case for most federal central banks), there will be no strategic delegation and the rule will be efficient. In this case cultivating the federal preferences of regional presidents is inefficient.

4 Implications for the European Central Bank

The previous sections have uncovered two mechanisms that explain the expansive bias of regional central bankers. First, when regional central bankers care much for local economic conditions when compared to the national situation, the national monetary rule that they will support will be more expansionary than the one preferred by the board. Second, when regional central bankers at the federal level indeed care about the national aggregate figures, this may be anticipated by regional policy makers. Hence, in that case they will delegate policy making to less conservative central bankers.

The ECB is similar to the Federal Reserve System in the sense that its Governing Council consists of the Governing board of permanent members appointed by the Council of Ministers and of central bankers who
are the governors of the national central banks. The ECB is highly independent and the ECB website quotes the intention of the relevant Treaty articles: "Neither the ECB nor the national central banks (NCBs), nor any member of their decision-making bodies, are allowed to seek or take instructions from European Community institutions or bodies, from any government of an EU Member State or from any other body. Community institutions and bodies and the governments of the Member States must respect this principle and not seek to influence the members of the decision-making bodies of the ECB (Article 108 of the Treaty)."

National central bankers often state that indeed there high degree of conformity to the European interest in the Governing Council. Moreover, after a wobbling start, there now is consensus among commentators that the ECB speaks its one voice. Whether this conformity is indeed present behind closed doors is difficult to assess, for the Governing Council does not publish minutes of its discussions. Further, observers note that in ECB meetings voting is a rare occasion, which may be explained by pre-meetings. When difficult monetary decisions are to be made, there is a habit of coming to Frankfurt the evening before the meeting to discuss in private the policy stance. These meetings may reflect the desire of the Governing Council members to keep disagreement from showing up in the formal meeting. The reason is that these formal meetings are sometimes attended by the Commission or by the chair of the Council of Ministers.

There is some outside impression that the ECB should focus exclusively on price stability. However, the Treaty objectives state that: "The primary objective of the ESCB shall be to maintain price stability.....Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community as laid down in Article 2." (Treaty article 105.1). These objectives of the Union (Article 2 of the Treaty on European Union) are a high level of employment and sustainable growth. In addition, recently the ECB objective has moved somewhat towards inflation targeting, which gives the ECB more room to take the overall economic situation into
account in its monetary policy strategy.

Whether the ECB indeed has some Barro-Gordon preference structure at the back of its head is hard to assess. Estimating Taylor rules for the ECB offers some clues. Aksoy et al. (2002) evaluate Taylor rules for the ECB and conclude that the governing council does attach weight to output stabilization. Moreover, Kool (2005) shows that the ECB policy stance is relatively expansive when compared to the historical records of its member states. Both studies have difficulty to come to grips with extreme events such as 9/11 and the high volatility of the Euro/Dollar exchange rate. However, given the desire for reputation building, one would expect the opposite result in the early years of EMU. Based informally on the argument developed in this paper, Heinemann and Hufner (2002) shows that the implicit policy rule of the ECB favors the median country in the Euro Area. This suggests that ECB policy indeed is a bargain among its members, where the median state is pivotal. However, Aksoy et al. (2002) do not find support for the claim that ECB policy is maximizing joint the welfare of its members states when compared to a rule that takes account only of the average shock. They argue that this is because of the strong role of the ECB board in between the regional central bankers.

When taking account of the results of this paper, one may wonder whether European preferences of the ECB unambiguously is a good thing. We argue that when governors develop a truly European view, national government may start to become nervous whether the ECB policy will be too restrictive. Certainly, for member states that have a structurally low output gap when compared to the EMU average, the ECB policy will ex ante be too activist. Based on the HP output gap for the years 1991-2004 we have calculated that this only is the case for Germany and Austria. All other countries have an output gap higher than the EMU average.

Insert Table 1

To discuss the policy preferences of the members of the Governing Council of the ECB, to check whether there is indeed a expansionist bias
in the behavior of national central bankers, a problem is that there are no minutes of the meetings available. To accommodate this problem, we resort to the study of the professional history of the members. In Table 2 and 3 we show the scores of current national central bank presidents and the Board of the ECB for characteristics that are often associated with the degree of conservativeness (see e.g. Adolf (2003) and Eijffinger et al. 2000). These data are provided by national central banks on request.\(^2\) The figures \(<90\) give the average score for the variable in the 1960-1990 period, the details are available on request. Age is the age at which the central banker was appointed; then there are the percentages of working life spent in the financial/private sector, public sector (including politics and university) and the central bank; the last column shows whether the central banker has a Ph.D. in economics.

Insert Table 2 and 3

First, as there is no clear trend, we can not conclude that EMU dramatically altered the delegation decision of national governments – although the German case springs to mind. In addition, two features of the data stand out. First, present regional central bankers have a longer history in bureaucracy and especially the national central bank itself. This may respect the increased technical complexity of central banking. Second, the governing board is split between two ‘conservative’ senior members (Trichet en Issing), and three relatively dovish members. Gonzales and Papademos both have a long history in academia and Smaghi is young (but holds a Ph.D. from Chicago...).

In conclusion, for revealed preferences in the form of Taylor rules there is some weak evidence that the ECB does take account of the output condition in the Euro area, at least that its reaction to output fluctuations is not too restrictive. The analysis of national central bank officials shows no clear delegation effect because of EMU. However, members of the governing council score low on anti-inflationary credentials, mostly because many of them have a history in government and academia. Moreover, recent delegations to the governing board by the

\(^2\)The Italian and Greek central bank did not cooperate, so we have excluded them.
Council of Ministers have been rather activist, suggesting that there is a reduced need for national hawks.

References


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<th>Country</th>
<th>Output gap</th>
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Source: DSI database, with own calculations.
## Table 2: Board of the ECB

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