

# RESTRUCTURING THE ECB

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# RESTRUCTURING THE ECB

## Abstract

Soon, euro area membership could more than double, with the vast majority of accession countries being quite different in economic terms compared with current members. Under the current decision-making system, this can lead to high decisionmaking costs and there is a risk that monetary policy could deviate from the targets specified in the Maastricht treaty. While centralization might be a “first-best” solution to these problems in many ways, there are possible disadvantages from a political economy perspective, including a potential conflict with the established voting rights of current euro area member countries. An alternative solution to ensure the European perspective of decision-making in the ECB Council is to match economic size and voting power. One way to implement this principle is a rotation scheme for national central bank governors that takes economic differences between the member countries into account. The paper discusses various rotation schemes, also with a view to the decision-making cost argument.

JEL Classification: D72, E58.

Keywords: European Central Bank, centralization of monetary policy, EMU, transition countries, accession countries.

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## 1. Introduction

On 1 January 1999 Europe entered a new era with the adoption of a single currency – the euro – by 11 of the European Union’s 15 member states. Greece joined the euro area in 2001. With the start of the Economic and Monetary Union (EMU), the European Central Bank (ECB) is responsible for monetary policy in the euro area. The ECB’s primary objective as laid down in the Maastricht Treaty is price stability, quantified by the ECB as inflation in the euro area below 2 per cent in the medium run. The ECB’s Governing Council, which decides about interest rates, consists of the Executive Board of the ECB - made up of the president, the vice-president and four other members - and the central-bank governors of the 12 euro countries (see Figure 1). When taking monetary policy decisions, the members of the Governing Council of the ECB should not act as national representatives, but in a fully independent personal capacity. This is reflected in the principle of “one person, one vote”.

Even though the ECB is a very young institution, there is already a debate going on about its reform in view of the upcoming enlargement of the European Union (EU). The European Council of Nice of December 2000 has asked the ECB Governing Council to prepare suggestions for a reform of its statute by the end of 2002.

There are basically two reasons why the issue of reform of the ECB is on the political agenda. First, ten Eastern European countries<sup>1</sup> and two Southern European countries (Malta and Cyprus) are expected to apply for euro area membership after accession to the EU.<sup>2</sup> Furthermore, three EU members, that are currently not members of the euro area, could adopt the euro in the near future (the United Kingdom, Sweden, and Denmark). So membership in the Eurosystem might increase from the current 12 to 27. In the absence of modification of the current ECB statute, this enlargement could have severe consequences for the efficiency of monetary policy-making in the euro area. A larger ECB Council would experience greater *difficulties in decision-making* than the smaller body governing monetary policy in the euro area

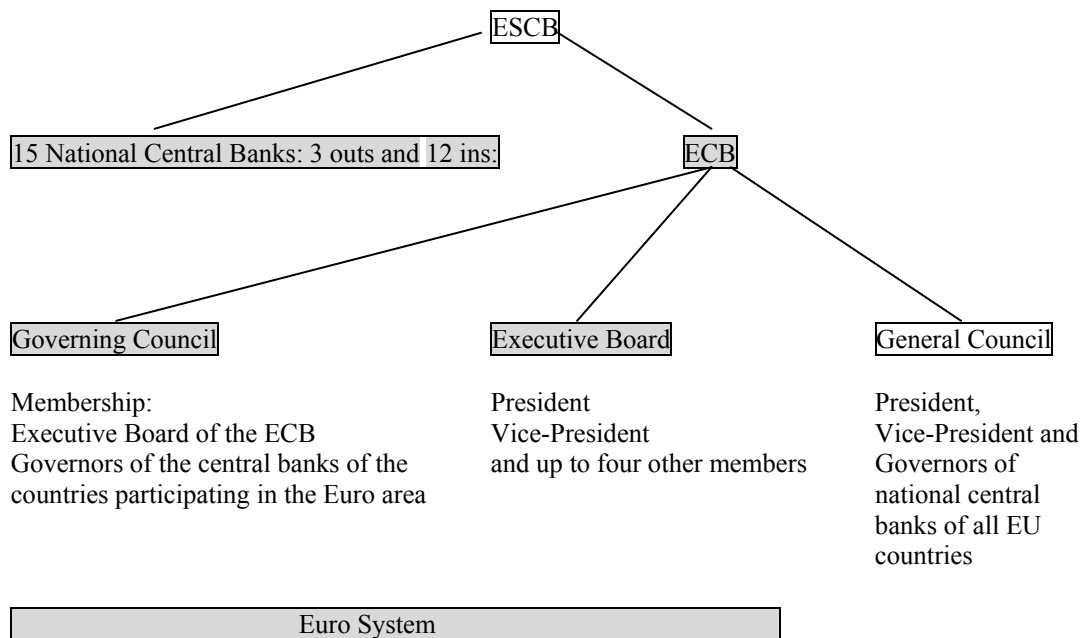
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<sup>1</sup> The countries are Slovenia, Czech Republic, Hungary, Poland, Estonia, Slovak Republic, Latvia, Lithuania, Bulgaria, and Romania.

<sup>2</sup> Since EMU membership is part of the *acquis communautaire* of the EU, accession countries will join EMU and the European System of Central Banks (ESCB) as they join the EU. However, EMU and ESCB membership do not necessarily imply euro area membership, as countries wanting to adopt the euro must fulfil the Maastricht criteria.

today. Without reform of the current ECB statute, the size of the ECB Council could increase from 18 to 33, making it by far the largest monetary policy-making institution among OECD countries. Due to this increase in membership, discussion and voting procedures would likely become more time-consuming and complicated. The central bank's tradition of consensus-based policy-making – said to play an important role in today's ECB decision-making process, too – could further amplify the ECB's "number problem" and increase decision-making costs.

**Figure 1. Structure of the European System of Central Banks**



Source: Eijffinger and De Haan (2000)

Second, an increase in euro area member states without reform would affect the *wedge between the economic and political weights* of EMU member countries within the ECB. Since almost all accession countries are small in economic terms relative to current euro area members, enlargement within the given institutional set-up would significantly increase the degree of over-representation of the area's smaller member countries in the Council in terms of relative economic size. For instance, in a monetary union with 27 members the current ECB statute implies that the representatives of its smallest 17 member states, representing only about 10 per cent

of the area's aggregated GDP, could determine monetary policy decisions in the euro area. Over-representation, while not necessarily a problem per se, has the potential to introduce an unwelcome bias into the ECB's decision-making, if country representatives put at least some weight on national economic developments and these developments deviated notably from the behavior of euro-area aggregates. Since the bulk of the accession countries are transition economies, they may be subject to idiosyncratic shocks and somewhat higher structural inflation than the core of the euro area. There is reason to believe that such asymmetries could have an impact on ECB policy-making.<sup>3</sup>

In this paper we discuss various ECB reform options. We argue that, while centralization might be a "first-best" solution to the problems potentially associated with enlargement in many ways, it might have disadvantages from a political economy perspective, including a potential conflict with the established voting rights of current euro area member countries. An alternative solution to ensure the European perspective of decision making in the ECB Council is to match economic size and voting power. When countries have voting power in proportion to their GDP share, it matters less if they behave according to national instead of euro-area-wide interests. One way to implement this principle – even if imperfect in practice – is to introduce a rotation scheme for national central bank governors that takes economic differences between the member countries into account.

The remainder of the paper is structured as follows. Section 2 discusses the two basic problems of an enlarged EMU in somewhat more detail. Section 3 reviews reform options, while section 4 focuses on one specific option: rotation. Various rotation schemes are discussed. Section 5 examines the reform proposal recently put forward by the ECB. The final section offers some concluding comments.

## **2. The main problems**

The upcoming enlargement of the euro area is likely to influence the effectiveness of the ECB's current policy-making framework through at least two channels: the

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<sup>3</sup> Indeed, some critics of the ECB argued that its decentralized nature was a design flaw right from the beginning. For instance, *The Economist* (1998, pp. 85-6) stated that: "The Governing Council is supposed to set interest rates according to conditions in the euro area as a whole, but there is a risk that national governors will be unduly influenced by conditions in their home country. Small countries may

increase in the number of decision-makers and the growing heterogeneity of member countries in economic terms.<sup>4</sup> Turning, first, to the implied increase in the number of decision-makers involved, Table 1 reveals that the number of Council members could increase from currently 18 members to up to 33 in the scenario that includes membership of the potential new EU countries as well as the U.K., Sweden, and Denmark. An increase in the number of Council members of this magnitude could complicate decision-making. Table 1 (fourth column) shows that the ECB Council, with its 6 Board members and 12 national central bank governors, is already relatively large compared to the decision making bodies of other federal central bank systems, like the Bundesbank's Zentralbankrat and the Fed's Federal Open Market Committee (FOMC). After enlargement, the number of voting members in the ECB Council could be almost three times higher than the number of FOMC members and twice as high as the number of Zentralbankrat members.

**Table 1. Distribution of voting power in selected central bank models**

	Board (1)	National Central Banks (2)	Council (1) + (2)	$\frac{(2)}{(1) + (2)}$ %
<i>Federal central bank models</i>				
Bundesbank pre-1957	1	9	10	90.0
Bundesbank pre-1992	7	11	18	61.1
<b>Bundesbank<sup>a)</sup></b>	<b>8</b>	<b>9</b>	<b>17</b>	<b>52.9</b>
<b>Fed<sup>b)</sup></b>	<b>7</b>	<b>5</b>	<b>12</b>	<b>41.7</b>
ECB 1999	6	11	17	64.7
<b>ECB 2001</b>	<b>6</b>	<b>12</b>	<b>18</b>	<b>66.7</b>
<b>ECB with 27 EMU members</b>	<b>6</b>	<b>27</b>	<b>33</b>	<b>81.8</b>

<sup>a)</sup> Since the 1992 Bundesbank reform, 9 regional central banks cover all 17 Länder. A further reform of the Bundesbank status is under discussion.

<sup>b)</sup> At any given time, only 5 out of the 12 regional central banks hold FOMC voting rights. The NY Fed is allocated a permanent seat in the FOMC, while the remaining 4 seats rotate among the remaining 11 regional central banks.

Source: Central banks, own calculations.

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also carry undue weight in the system.... A weak centre, combined with strong national interests, could create conflicts that undermine the whole system's credibility."

<sup>4</sup> See Berger (2002) for a somewhat more extensive treatment of the issues covered in Section 2.

Both the Bundesbank and the Fed have constrained the size of their decision-making bodies with a view to decision-making costs. For instance, Eichengreen (1992) argues that today's organizational framework of the Fed – which restricts the number of regional central banks voting in the FOMC to 5 out of 12 – was installed, among other reasons, to reduce inefficiencies stemming from the involvement of too many decision-makers. As far as the Bundesbank is concerned, it is interesting to note that the reform of 1992 prevented an increase in the number of Länder representatives in the Bundesbank Council after unification. Without a reform, the Council could have increased to 23 or more members, which, according to the Bundesbank, “would have greatly complicated that body's decision-making processes” (Deutsche Bundesbank 1992, p. 50). This echoes concerns raised by Friedman and Schwartz (1963). In their seminal study of American monetary policy, they attribute the severity of the depression of the 1930s to serious policy mistakes by the Federal Reserve, caused by its excessively decentralized decision-making structure:

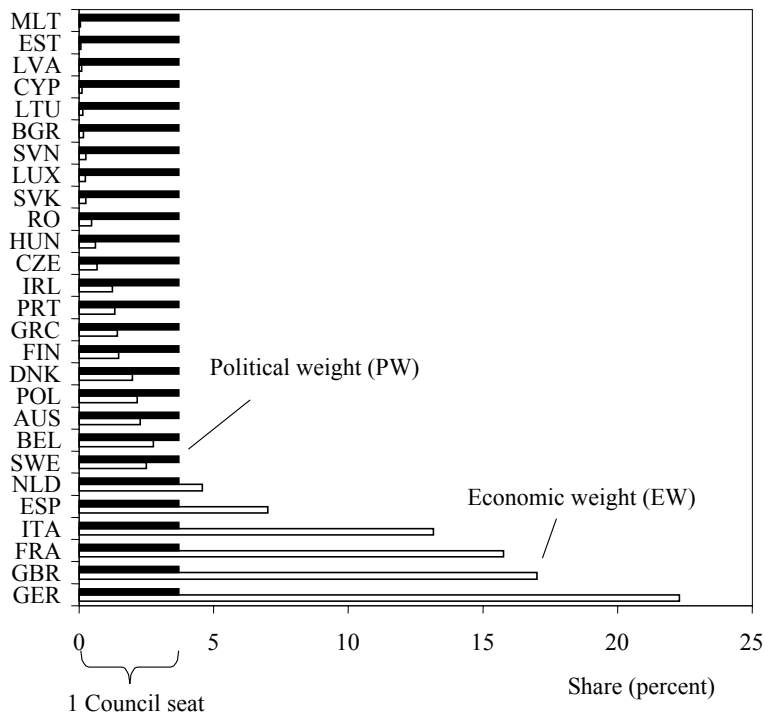
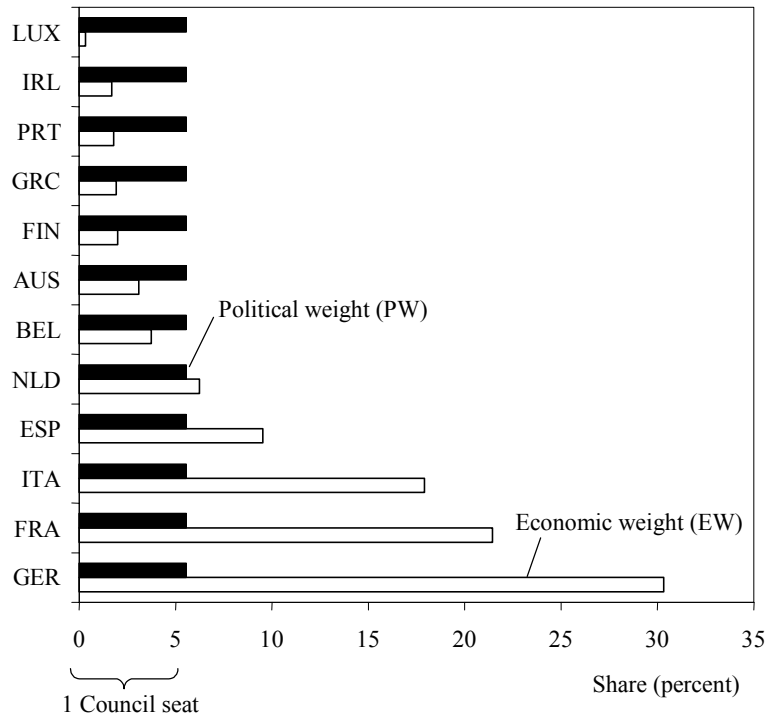
“There is more than a little element of truth in the jocular description of a committee as a group of people, no one of whom knows what should be done, who jointly decide that nothing can be done. And this is especially likely to be true of a group like the Open Market Policy Conference, consisting of independent persons from widely separated cities, who share none of that common outlook on detailed problems or responsibilities which evolves in the course of long-time daily collaboration.” (Friedman and Schwartz, 1963, pp. 415-16)

According to Friedman and Schwartz, the consequence of a weak center is that the decision-making process becomes too cumbersome and slow, possibly resulting in sub-optimal decisions. An ECB Council with more than 30 members is likely to need significantly more time than today's Council of 18 to discuss and evaluate the state of the economy and to prepare monetary policy decisions. Even though a more extensive use of explicit voting procedures might help to limit decision-making costs, the prevalent culture of consensus-based decision-making in the ECB Council might limit the use of voting practices. Baldwin and others (2001) argue that, in addition, the Board's leadership ability will be seriously reduced as the number of countries in the euro area increases and its relative voting power decreases.

A second insight provided by Table 1 (fifth column) is that the political weight attached to national or regional central bank representatives within the ECB framework is comparatively large. In many industrial countries, monetary policy decisions are delegated to central banks with smaller decision-making bodies in which all members are centrally appointed. Both the German Bundesbank and the U.S. Fed have systematically reduced the political weight of regional representatives in the Council (Eichengreen 1992, Berger and de Haan 1997). While, at an earlier stage, both institutions resembled unions of national central banks, over time, the central element in both central banks was strengthened. Today, the vote share of regional representatives is about 53 per cent of all votes in the case of the Bundesbank and about 42 per cent in case of the Fed's FOMC. The political weight of national central bank governors in the ECB Council at about 67 per cent of all votes is significantly higher; and this percentage could increase to as much as 82 per cent after enlargement.



Figure 2. Economic and Political Weights of Central Banks Before and After Enlargement



Under the current decision-making set-up of the ECB, small member countries carry a larger political than economic weight (Berger and de Haan 2002). The upper panel of Figure 2 shows the economic weight (defined as the share of a country in the euro area's GDP) and political weight (the vote share of the country's central bank governor in the ECB Council) of individual member countries in today's ECB.<sup>5</sup> On the one hand, countries like France or Germany produce about 1/5 and 1/3, respectively, of the euro area's GDP or more but hold only 1/18 of the overall votes. On the other hand, the political weight allocated by the present ECB framework to smaller countries such as Ireland clearly exceeds their economic weight. In fact, according to Figure 2, this is the case for more than half of all current euro area members.

The lower panel of Figure 2 shows that in a euro area of 27 members without a reform of the ECB nearly 80 per cent of the countries will have a larger political than economic weight. If the "one person, one vote" principle were strictly applied, all newcomers but the U.K. would be allocated a political weight surpassing their economic weight, in most cases by a significant margin.<sup>6</sup> As already mentioned, a coalition of the smallest euro area members with enough votes to command the majority of overall Council ECB seats would represent merely about 10 per cent of the euro area's total GDP. The equivalent figure in today's euro area is close to 50 percent.

The over-representation of smaller member states could introduce an unwelcome bias into the ECB's decision-making if: 1. national central bank governors put at least some weight on national economic developments, and 2. these developments deviate significantly from the behavior of euro area aggregates.<sup>7</sup> For instance, a decrease in euro area economic activity is probably more strongly felt in a country with relatively low per-capita income than in better-off regions. Likewise, countries with already a high level of inflation might be more sensitive to a euro-area-wide increase in inflation than low-inflation regions.

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<sup>5</sup> We assume that the nationality of members of the Executive Board does not influence the political weight of a country.

<sup>6</sup> See Berger (2002) for a more extensive analysis of the impact that enlargement has on the mismatch between economic and political weights.

<sup>7</sup> Gros and Hefeker (2002) analyze differences in monetary transmission in the context of monetary policy-making within the euro area.

Even though “members of the [Council] do not act as national representatives, but in a fully independent personal capacity” (ECB 1999, p. 55), it is certainly possible that national economic welfare plays at least some role in the (voting) behavior of regional representatives in the ECB Council. Indeed, if national background should not play any role in the ECB decision-making process, why then have the European governments not delegated monetary policy fully to the Executive Board in the first place? In fact, the hypothesis of regional influences in a federal central bank system is supported by recent studies on U.S. and German monetary policy. Berger and de Haan (2002) present evidence that regional differences in growth and inflation had a significant influence on the voting behavior of Zentralbankrat members. Similarly, Meade and Sheets (2002) find that Fed policy-makers do take developments in regional unemployment into account when deciding on monetary policy in the FOMC. They show that an increase in a region’s unemployment rate (for a given national rate and evaluated at sample means) by one percentage point reduced the probability that a FOMC member dissented from the majority vote by about 2 percentage points over the 1978-2000 period. While no direct evidence of such behavior exists for today’s ECB, Meade and Sheets (2002) argue that recent interest rate decisions by the ECB Council at least do not allow rejecting the hypothesis that national central bank governors vote with a regional bias in the euro area as well.<sup>8</sup>

As argued above, a too strong representation of new national central bank representatives in the ECB Council could introduce a bias into euro area policy-making after enlargement, if the behavior of their respective national economies deviates significantly from today’s euro area. But just how different are economic developments and what consequences might follow for monetary policy?

Probably the most important distinguishing feature of the majority of candidate countries is their status as *transition economies*. Real per capita income in most accession countries is very low compared to current euro area levels and the process of convergence is commonly thought to be slow. Fischer and others (1998a/b) estimate that it might take many Eastern European countries until the 2020s at the

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<sup>8</sup> Recently, Heinemann and Huefner (2002) have estimated reaction functions for the ECB. As there are no voting records for the ECB Governing Council, these authors had to rely on indirect ways to examine whether diverging economic developments in the euro area have affected ECB policy-making. In their ordered probit model, these authors find that the difference between euro area average and

minimum to catch up even with the less well-off countries in the current euro area. Slowly diminishing income differences could make real growth an attractive policy target for some of the governors representing accession countries in the ECB Council.

The data show that – as to be expected during real conversion – the *average growth rate* of accession countries during 1996-2001, while falling short of the rates achieved in some faster growing member countries such as Ireland and Finland, exceeded average growth in the euro area by about 1 percentage point (Berger 2002, Figure 3). Recent empirical work suggests that this trend is likely to continue, contributing to a considerable increase in the dispersion of growth rates within the euro area compared to the status quo.<sup>9</sup> One likely consequence of higher-than-average growth in the accession countries in the years ahead is higher *inflation* than in the current euro area. Indeed, the average inflation differential between the euro area and accession countries was around 8 percentage points during 1996-2001, even with Bulgaria and Romania – two high-inflation countries – excluded (ibid.).

It is often argued that due to the Balassa-Samuelson effect, transition countries have experienced a real appreciation of their real exchange rates. When productivity growth in the traded goods sector exceeds that in the non-traded goods sector, non-traded goods prices increase due to the wage equalization process between both sectors. When productivity growth in the transition countries exceeds productivity growth in the countries in the euro area, the transition countries will have a higher inflation rate. According to Eurostat (2001), the average labor productivity level in manufacturing in transition countries was only about 40 per cent of the EU average in 1998. A process of catch-up would imply high productivity growth in the future, and consequently, higher inflation rates relative to current euro area members.

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median of the inflation and output gap is significantly different from zero, albeit only at the 10 per cent level.

<sup>9</sup> Eichengreen and Ghironi (2001) use an empirical growth model based on data from the 1980s and 1990s to predict future growth for a set of accession countries that includes Turkey, but excludes Bulgaria, Cyprus, and Malta. In a panel study, Crespo-Cuaresma and others (2002) find the length of EU membership to have a significant positive effect on economic growth, which is relatively higher for poorer countries. Havrylyshyn (2001) provides a recent survey on the available empirical evidence on growth during transition.

**Table 2. Estimates of the inflation differentials (%) in the transition countries**

Study:	Countries:	Vis-à-vis (if relevant):	Size:
Jakab and Kovacs (1999)	Hungary		1.9
Pelkmans et al. (2000)	CEE 10	29 OECD countries	3.8
Rother (2000)	Slovenia		2.6 during 1993-98
Sinn and Reuter (2001)	Czech Rep. Hungary Poland Slovenia Estonia	Germany	2.88 6.86 4.16 3.38 4.06
Halpern and Wyplosz (2001)	Panel of 9 transition countries (incl. Russia)	Based on model for service-to- consumer goods price ratio	2.9-3.1 for the period 1991-99
Corizelli and Jazbec (2001)	Panel of 19 transition countries	Based on model for relative price of tradable goods	1 in the medium term (1990-98)
De Broeck and Sløk (2001)	Panel of transition countries		On average 1.5
Égert (2002a)	Czech Rep. Hungary Poland Slovakia Slovenia	Germany	0.648 <sup>a)</sup> 0.303 for 1991-2000 2.589 1.295 for 1991-2000 3.245 1.901 for 1991-2000 -0.154 -0.075 for 1993-2000 1.321 0.661 for 1993-2000
Égert (2002b)	Panel of Czech Rep., Hungary, Poland, Slovakia and Slovenia	Germany	With share of non-tradables as in GDP it ranges from 0.094 to 1.903 depending on time period and data. Estimates for 1996-2001 period range from 1.707 to 1.903. With share of non-tradables as in CPI the latter range from 0.810 to 1.059.
Backé et al. (2002)	Czech Rep. Hungary Poland Slovenia	Main trading partners <sup>b)</sup>	0.35 1995-2000 3.84 1995-2000 9.76 1995-2000 3.88 1995-2000

a) First column shows results using GDP deflator, second column shows results with CPI.

b) Under the assumption that there are no productivity-inflation differentials between tradable and non-tradable goods in the main trading partners, which seems unrealistic.

There is, however, no clear consensus in the literature on the magnitude of the Balassa-Samuelson effect in the transition countries. Table 2 provides a summary of various recent studies. Various estimates conclude that it contributes about 2-4 percentage points to headline inflation.<sup>10</sup> Still, the estimates vary widely. Whereas Pelkmans et al. (2000), for instance, estimate that the Balassa-Samuelson effect is likely to imply almost four additional percentage points of annual inflation in the accession economies, Ègert (2002a) finds little evidence of a higher inflation rate due to the Balassa-Samuelson effect in the Czech Republic and Slovakia.<sup>11</sup>

Part of these diverging outcomes is the result of differences in method. For instance, not all studies summarized in Table 2 restrict themselves to estimates of the Balassa-Samuelson effect. The literature has pointed out various other channels that can give rise to inflation differentials and some of the studies take these into account. For instance, Halpern and Wyplosz (2001), who estimate the Balassa-Samuelson effect for a panel of nine transition countries (including Russia) also include demand factors. The same is true for Corizelli and Jazbec (2001), who, in addition, add a variable that captures structural misalignments.<sup>12</sup>

Yet another distinguishing feature of the candidate countries might be the *business cycle*. Table 3 shows the correlation between the cyclical components of industrial production in the various (potential) member states with the cyclical part of industrial production in the euro area. Industrial production is decomposed into a trend and a cyclical component, using a Hodrick-Prescott filter (see also Artis and Zhang 1999 and Inklaar and De Haan 2001).<sup>13</sup> It follows that except for Slovenia and, to a lesser extent, Cyprus, the accession countries have business cycles, which are hardly synchronized with the business cycle in the euro area. Note, however, that this also holds true for some euro area countries, notably Greece and Portugal.

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<sup>10</sup> Most studies concede that Balassa-Samuelson effects, while being quantitatively important, cannot explain the entire difference in structural inflation between accession and euro area countries.

<sup>11</sup> The Balassa-Samuelson effect is often seen as argument why accession countries may find it difficult to meet simultaneously the Maastricht criteria on inflation and exchange rate stability. See, for instance, Szapary (2000).

<sup>12</sup> A very different estimation procedure has been followed by Pelkmans et al. (2000). These authors have based their estimation on relative price levels in accession countries compared to current EMU member countries rather than on productivity growth differentials. Their results show on average an inflation differential of 3.8 percentage points between the accession countries and the euro area average due to estimated differences in the price levels.

<sup>13</sup> See the Appendix 2 for further details and sources of the data used.

**Table 3. Business cycle correlation (with EU12) for the period 1990-2001**

Current EU members		Future EU members	
Austria	0.49	Bulgaria	n.a.
Belgium	0.36	Cyprus	0.32
Finland	0.36	Czech Rep.	0.11
France	0.76	Estonia	0.11
Germany	0.75	Hungary	0.20
Greece	0.18	Latvia	0.17
Ireland	0.26	Lithuania	-0.17
Italy	0.62	Malta	n.a.
Luxembourg	0.38	Poland	0.17
Netherlands	0.33	Romania	-0.04
Portugal	0.06	Slovakia	0.12
Spain	0.71	Slovenia	0.65
Denmark	0.52		
Sweden	0.36		
UK	0.31		

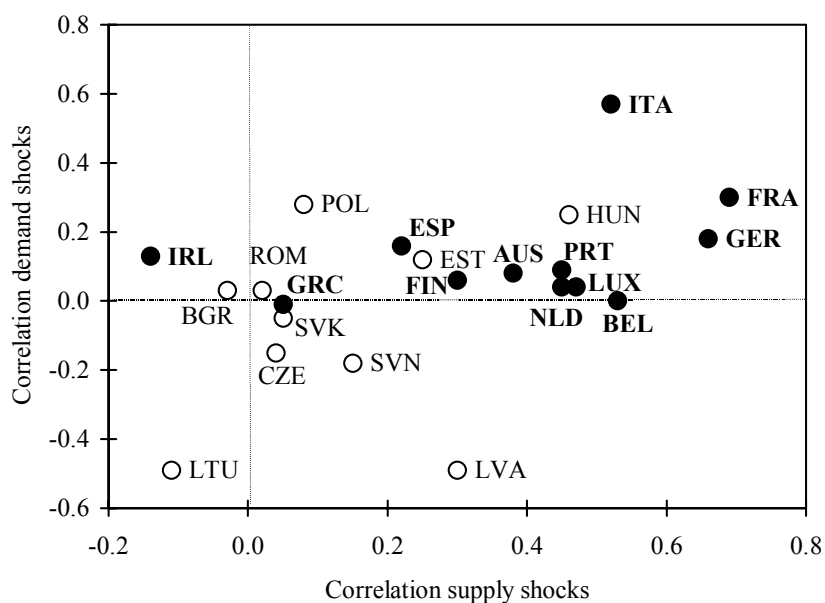
Note: see Appendix 2 for sources and methods.

Business cycles may differ across currency areas or regions within a currency area for various reasons. First, currency areas and regions may experience different shocks. Secondly, they may respond differently to common shocks. This may be caused by dissimilar reactions of policy-makers to a common shock, or because of differences in the currency area or regional composition of output. In addition, heterogeneity in financial and economic structure may lead to differences in the monetary policy transmission mechanism.

Figure 3 sheds further light on the correlation of shocks. It displays the correlation of demand shocks and supply shocks in quarterly real GDP between individual euro area and accession countries with demand and supply shocks in the euro area aggregate computed by Fidrmuc and Korhonen (2001). The sample period is 1991/92-2000 for most countries. Shocks are identified using two-variable VARs for output and prices and the Blanchard and Quah (1989) assumptions. The results suggest that, on average, demand and supply shocks are more closely correlated within the euro area. Most present euro area countries are located in the upper-right part of the figure, while the majority of accession countries can be found in the lower-

left, indicating non-significant or negative correlation.<sup>14</sup> Exceptions are two of the more advanced countries among the candidate countries, Estonia and Hungary. Greece, a late-comer to the euro area and still early in its real convergence process, and fast-growing Ireland look as loosely connected to the euro area as most accession countries.

**Figure 3. Demand and Supply Shocks in the Euro Area and in Accession Countries**



*Source:* Fidrmuc and Korhonen (2001), Table 2.

<sup>14</sup> The weighted average of the demand and supply shocks coefficients of correlation are 0.24 and 0.52 for the euro area countries and 0.13 and 0.11 for the accession countries (Malta and Cyprus excluded).



The main message stemming from the analysis thus far is that most accession countries are subject to different macroeconomic shocks – and thus a different business cycle – than the current euro area. While real convergence will probably work to reduce these idiosyncrasies in the long run, they will certainly remain in the short- and medium-term. In the absence of reform of the present ECB framework, this could have an impact on monetary policy-making in the euro area.

### **3. Reform Options**

The discussion above suggests that, possible reforms of the ECB should aim at: keeping the number of decision makers on the ECB Council within reasonable limits; strengthening the voting power of the Board; and aligning the economic and political weights of countries in the Council with one another.<sup>15</sup> A number of possible reform scenarios along these lines can be distinguished.

#### **3.1 Centralization**

A larger role for the Executive Board in ECB decision-making would go a long way limiting *decision-making costs* and preventing possibly diverging economic developments within a larger euro area to have an undue impact on monetary policy in the euro area.<sup>16</sup>

A pragmatic application of the centralization scenario would be to put actual policy-decisions into the hands of the existing ECB Board. This would limit the role of the Council to that of an informational forum in which the area's regional central banks would be informed of policy decisions and implementation issues would be discussed.<sup>17</sup> The EU Treaty states that the Board (including the President of the ECB, the Vice-President, and four additional members) is appointed by “the governments of

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<sup>15</sup> Berger (2002) provides a more formal discussion of these reform considerations. See Appendix 1 for a summary. See also Baldwin et al. (2000, 2001) and Eichengreen and Ghironi (2001) for papers dealing with ECB reform.

<sup>16</sup> The advantages of a stronger role for the centrally nominated ECB Board were also discussed in the literature on the optimal institutional design of the ECB before the (virtual) euro was introduced in 1999. See, among others, von Hagen and Süppel (1994) and Lohmann (1997, 1998). Also compare Bindseil (2001). In light of the enlargement discussion, Baldwin and others (2001) argue for full centralization, pointing to the increase in decision-making costs implied by euro area enlargement.

<sup>17</sup> This is akin to some of the functions the General Council of the European System of Central Banks performs today. The General Council will exist as long as some EU countries remain outside the euro area. See Figure 1.

the member states at the level of Heads of State or Government, on a recommendation from the Council, after it has consulted the European Parliament and the Governing Council of the ECB” (EU 1997, Article 112 2. (b)). A highly centralized political process on the European level like this should help support a *euro-area-wide perspective* of those selected for the Board. There are, however a number of arguments that suggest that national central banks should continue to play an important role in ECB decision-making (Berger 2002).

- A first argument concerns *information*. Efficient monetary policy requires the timely provision, aggregation, and processing of information originating on the regional level, especially in the case of a currency union that encompasses a large number of heterogeneous countries and regions. It might therefore be helpful to ensure that ECB Council members with a strong regional anchor such as national central bank governors are directly involved in actual monetary policy decision.
- A second argument is that the absence of national central bank governors from the ECB Council could have a negative effect on the ECB’s political *independence*. The participation of all euro area member states in the selection of ECB Council members (through the nomination of their respective national central bank governors) in the current ECB statute might help insulating the ECB from preference shocks at the government level, for instance, after elections.
- A third argument against allocating the complete decision-making power in the ECB Council to the Board, alludes to the *political feasibility* of centralization. As already mentioned, the ECB Statute clearly states, “Each member of the Governing Council, shall have one vote” (EU 1992, Article 10.2), which includes the national central bank governors. Thus, a reform of the ECB that fails to safeguard the established voting rights of current member countries’ central banks might not be politically acceptable. After all, an equal right to participate in ECB policy decision-making was an integral part of the Maastricht treaty that established the currency union. Some member governments could experience opposition to letting go the “last” bit of influence on ECB policy making after having exchanged monetary sovereignty for a seat at the ECB Council in 1999.

### **3.2 Matching economic size and political power**

If centralization is not a feasible (or desirable) reform option, a reform of the ECB Statute should aim at an institutional design in which economic size and political

voting power are in line.<sup>18</sup> When countries have as much voting power as GDP share, it is less problematic if they behave according to national instead of euro-area-wide interests. Decreasing the mismatch between economic and political weights would bring actual stabilization policy closer to the outcome under the first-best solution. In fact, fully matching political and economic weights is likely to guarantee that actual monetary policy is perfectly in line with the ideal policy of stabilizing the euro area business cycle based on a correctly weighted average of the underlying regional cycles. If the accession countries were politically over-represented in the absence of a reform of the current ECB decision-making framework, the second-best solution is also likely to reduce actual inflation, although it will probably remain higher than in the first-best solution (Berger 2002). The principal reform options include: vote-weighting, representation, extending regional central banks across national borders, and rotation.

Under **vote-weighting**, the votes of non-Board member of the ECB Council would be weighted when cast for monetary policy decisions, for instance by using member countries' share in euro area GDP. By definition, a reform along these lines would better align the *political and economic weights* of the national Council members. Vote-weighting has precedence in the qualified voting schemes of the EU Council, which the treaty of Nice has tentatively updated for the case of EU enlargement.<sup>19</sup> Another voting scheme that takes into account differences in economic size is the idea of a required "double majority" of votes and population. Under such a system, there is still an equal voting right for all Board members. Every decision requires a majority of the votes. In addition, however, it is also required that the votes in favor represent a majority of the population of the euro area. An alternative would be to require that these votes represent a majority of the euro area's GDP.

A problem with any vote-based reform scenarios is, however, that they do not necessarily address the problem of *decision-making costs*. Decision-making costs in the narrow sense of voting on, interest rate changes, say, need not to be particularly problematic. However, in all likelihood the Council's decision-making process will involve more than the simple aggregation of votes, but also, for example, a more or less extensive discussion of the views of all members. In this case, weighting votes

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<sup>18</sup> Obviously, if none of the Council members showed a regional bias in its decision-making to begin with, bringing political and economic weights of national central bank governors in line will not hurt the euro-area-wide perspective of the Council either.

does not necessarily solve the ECB's "large number problem". Finally, similar to the argument made regarding the centralization solution, it should be noted that a weighted voting scheme might be viewed as interfering too much with the "one person, one vote" principle embedded in the ECB Statute, although this may apply somewhat less to the "double majority" system.

An alternative reform scenario, **representation**, combines some of the characteristics of the centralization and the weighing approach. The principal idea would be to create groups of euro member countries with joint representation and joint voting rights in the ECB Council, integrating the concept of a strong regional anchor with the necessity of restricting the size of the ECB's main decision-making body after the enlargement. The representation scenario requires a number of specific institutional decisions, in particular on group selection. The selection principle could be based on the idea of common economic regions (taking into account similarities in business cycles or economic structure), economic size, or both. Related issues are the number of groups, the overall Council size, and the delegation of voting power from group members to their representative in the ECB Council. The alternative institutional designs range from a restricted or "imperative" mandate (votes in the Council are pre-determined at the group level) to an unrestricted mandate (group members delegate their full voting rights to their representatives).<sup>20</sup> However, since the latter arrangement could, in principle, deprive individual group members of their right to participate in the decision-making, there is a potential conflict with the idea of national representation and the "one person, one vote" principle. This makes a solution entailing some form of explicit involvement of national central banks at the group level before a Council decision, i.e. a restricted mandate for the group representatives in the Council, a likely part of any representation scenario. Such a restriction is likely to encompass contributions to Council discussions as well as formal voting. In this sense, it will alleviate the *decision-making costs* problem at the level of the ECB Governing Council. However, these costs will substantially increase at the level of the group. If the mandate of group representatives in the Council is restricted, in the sense that their actions require the explicit consent of group

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<sup>19</sup> See Berger (2002) for further details.

<sup>20</sup> The organization of the IMF Board is an example of unrestricted mandates. Even though all Directors de facto operate in close collaboration with their constituency, the IMF's Articles of Agreement do not de jure require them to consult them or seek their approval before casting a vote in the Board.

members, the overall time and effort needed for a Council decision will be of a similar magnitude, if not higher, as in the previously discussed scenario.

A variant of the representation idea is the **extension of central bank jurisdictions** across national borders. For instance, the regional central banks in the U.S. Federal Reserve System extend the borders of the States of the Union and some of the (post-1992) Landeszentralbanken in the Bundesbank Zentralbankrat represent more than one German Land. An application of this principle to the ECB after enlargement could help to reduce the number of decision-makers in the Council. If the design of central bank areas aimed at establishing regional banks with approximately similar economic weight, it would also contribute significantly to avoiding mismatches between voting power and economic size. However, as with the previous scenarios, there could be issues regarding the *political feasibility* of a reform that included abolishing the existing voting rights of current euro area member states. Furthermore, it would imply that one of the basic principles of the current ECB set-up, i.e. “representation” of countries would be given up.

An alternative reform scenario that, in principle, might also be able to address both the mismatch between political and economic weights and the decision-making problem associated with the enlargement of euro area membership (while avoiding some of the political constraints discussed above) could be (asymmetric) **rotation**. The basic idea is that national central bank governors would take turns sitting at the Council, with the frequency of their participation scaled to match the relative *economic weight* of their respective country. Rotation would thus work to weight the votes of national central bank governors in an implicit fashion. Arguably, therefore, rotation will pose less of a conflict with the “*one person, one vote*” principle than centralization, weighted voting, or the representation scenario. While not all governors would be participating in every Council meeting, those who participate would be casting a full vote. Rotation could also serve to limit the overall *size of the ECB Council* by allowing only a fraction of central bank governors to participate in meetings. The ability to address the potential problems posed by enlargement while avoiding part of the political feasibility problems associated with some of the other reform ideas make rotation schemes a likely candidate for ECB reform. In the following section we will discuss a number of more specific options for such an ECB reform scenario.

#### 4. Rotation schemes

Reflecting the *decision-making costs* argument, we will discuss a number of rotation schemes under the assumption of an ECB Council of 15, with 6 Board members joining 9 central bank governors drawn from the population of all euro area member countries. A characteristic, which the rotation scenario shares with the representation scheme, is the necessity to *pool countries*. We assume a situation in which all current 27 potential EU-countries have joined the euro area. Based on the discussion in section 2, we have constructed groups on the basis of three criteria:

- Size, i.e. constructing groups that are homogenous regarding the share of euro area GDP represented by each member to ensure that the ECB Council reflects the euro area to the greatest extent possible
- Inflation, i.e. minimize the average within-group standard deviation of inflation
- Correlation of business cycles with other members in the group, i.e. maximize the within-group business cycle correlation.

Table 4 shows the outcomes of the groupings and the probability that any country will occupy a seat in the ECB's Governing Council, while Table 5 reports the characteristics of the various rotation schemes. All calculations for correlation with EU-12 averages do not include the country itself.

**Table 4. Various rotation groups according to economic criteria**

	(1)	(2)	(3)	(4)	(5)
	<i>Size (1)</i>	<i>Size (2)</i>	<i>Size (3)</i>	<i>Inflation</i>	<i>Business cycle with other group members</i>
Group1	GER	GER, FRA, ITA,	GER, FRA, ITA	FRA, GER, SWE	FRA, SPA, GER
Group2	FRA	UK, SPA	UK, SPA, NET	AUT, FIN, LUX	POL, CZE, HUN
Group3	ITA		POL, BEL, SWE	BEL, DEN, UK	UK, FIN, SLN
Group4	UK		AUT, POR, GRE	ITA, NET, CYP	IRE, SLK, LAT
Group5	SPA	NET, POL, BEL, SWE	ROM, CZE, DEN	IRE, SPA, MAL	AUT, DEN, SWE
Group6	NET, POL		FIN, HUN, IRE	GRE, POR, CZE	ITA, LUX, EST
Group7	BEL, SWE, AUT	AUT, POR, GRE	SLK, BUL, SLN	LAT, LIT, SLK	CYP, BEL, GRE
Group8	POR, GRE, ROM, CZE	ROM, CZE, DEN, FIN	LIT, LAT, LUX	EST, POL, SLN	NET, LIT, ROM
Group9	DEN, FIN, HUN, IRE, SLK, BUL, SLN, LIT, LAT, LUX, CYP, EST, MAL	HUN, IRE, SLK, BUL, SLN, LIT, LAT, LUX, CYP, EST, MAL	CYP, EST, MAL	BUL, HUN, ROM	POR, BUL, MAL
<b>Probability of occupying a Council seat in any period: (%):</b>					
Austria (AUT)	30.36	38.70	33.3	33.3	33.3
Belgium (BEL)	38.61	44.50	33.3	33.3	33.3
Denmark (DEN)	21.27	25.40	33.3	33.3	33.3
Finland (FIN)	17.21	20.50	33.3	33.3	33.3
France (FRA)	100.00	80.00	33.3	33.3	33.3
Germany (GER)	100.00	80.00	33.3	33.3	33.3
Greece (GRE)	25.62	30.50	33.3	33.3	33.3
Ireland (IRE)	11.37	18.50	33.3	33.3	33.3
Italy (ITA)	100.00	80.00	33.3	33.3	33.3
Luxembourg (LUX)	2.52	4.10	33.3	33.3	33.3
Netherlands (NET)	55.11	66.00	33.3	33.3	33.3
Portugal (POR)	25.78	30.70	33.3	33.3	33.3
Spain (SPA)	100.00	80.00	33.3	33.3	33.3
Sweden (SWE)	31.03	35.80	33.3	33.3	33.3
UK (UK)	100.00	80.00	33.3	33.3	33.3
Bulgaria (BUL)	7.62	12.40	33.3	33.3	33.3
Cyprus (CYP)	1.79	2.90	33.3	33.3	33.3
Czech Rep. (CZE)	23.26	25.90	33.3	33.3	33.3
Estonia (EST)	1.71	2.80	33.3	33.3	33.3
Hungary (HUN)	16.83	20.10	33.3	33.3	33.3
Latvia (LAT)	2.60	4.20	33.3	33.3	33.3
Lithuania (LIT)	3.85	6.30	33.3	33.3	33.3
Malta (MAL)	0.67	1.10	33.3	33.3	33.3
Poland (POL)	44.89	53.70	33.3	33.3	33.3
Romania (ROM)	25.34	28.20	33.3	33.3	33.3
Slovakia (SLK)	8.04	13.10	33.3	33.3	33.3
Slovenia (SLN)	4.53	7.40	33.3	33.3	33.3

**Table 5. Characteristics the various rotation schemes**

<b>Grouping:</b>	(1) <b>Size (1)</b>	(2) <b>Size (2)</b>	(3) <b>Size (3)</b>	(4) <b>Inflation</b>	(5) <b>Within group business cycle</b>	(6) <b>ECB proposal <sup>d)</sup></b>
1. Average GDP share represented	<b>80.65</b>	68.48	33.33	33.33	33.33	73.21
2. Minimum and maximum GDP share represented	78.9 / 81.8	58.5 / 76.7	25.2 / 44.5	6.4 / 66.6	11.3 / 64.4	61.1/84.9
3. Mismatch between economic and political weight <sup>a)</sup>	7.77	10.27	17.18	17.18	17.18	17.63
		<i>Within-group unweighted averages</i>				
4. Average within-group standard deviation of inflation	3.31	6.86	7.94	<b>2.80</b>	7.64	9.69
5. Average standard deviation of correlation with EU12 <sup>b)</sup>	0.06	0.18	0.20	0.18	0.09	0.22
6. Average within-group business cycle correlation <sup>c)</sup>	0.62	0.29	0.19	0.23	<b>0.41</b>	0.26

<sup>a)</sup> Measured as the sum of the squared differences between economic and political weights.

<sup>b)</sup> Excludes Bulgaria and Malta.

<sup>c)</sup> Excluding the country itself.

<sup>d)</sup> As of December 2002.

Notes: see Appendix 2 for sources and methods. GDP shares are calculated as an average for the period 1990-2001. Average correlation is calculated over the period 1990-2001. Average inflation is for 1995-2001 to exclude the first transition years.



A good starting point is rotation on the basis of *size*. The groupings under this heading aim at selecting countries of similar GDP share. The reason is that otherwise a rotation scheme could (with some positive probability) accidentally select only smaller countries to represent their respective groups, which would run against the idea to ensure that the central bank governors present in the ECB Council mirrors the euro area as a whole. In other words, group selection by size can help to ensure a high “minimum” representation of euro area GDP. A crucial issue here is whether we can accept that a group consists of one country only. In *option Size 1* we assume that the ‘big five’ (France, Germany, Italy, Spain and the UK) have a permanent seat in the Council. The size of the other groups under this option ranges from 2 (the Netherlands and Poland) to 13 (see column 1 in Table 4). Within each of these groups, there is *unequal rotation*, depending on the size of the countries concerned. For instance, in the group of Poland and the Netherlands, the latter country has a higher chance of occupying a Council seat in each period (55.11 per cent) than Poland (44.89 per cent). Obviously, the advantage of having permanent Council membership for the large countries is that the area represented in the decision-making of the ECB is very high. So, from the perspective of minimizing the risk of distorted policy-making this is clearly an attractive option, as – on average – almost 81 per cent of the euro area GDP is represented (see column 1 of Table 5). Table 5 also shows the minimum and maximum of the area represented (row 2). The minimum is the share of the euro area represented if the smallest countries in any group would be in the Council at the same time. Likewise, the maximum is the area represented if the biggest countries of the nine groups were all in the Council. For our first rotation scheme the maximum and minimum figures are fairly similar (78.9 and 81.8 per cent, respectively).

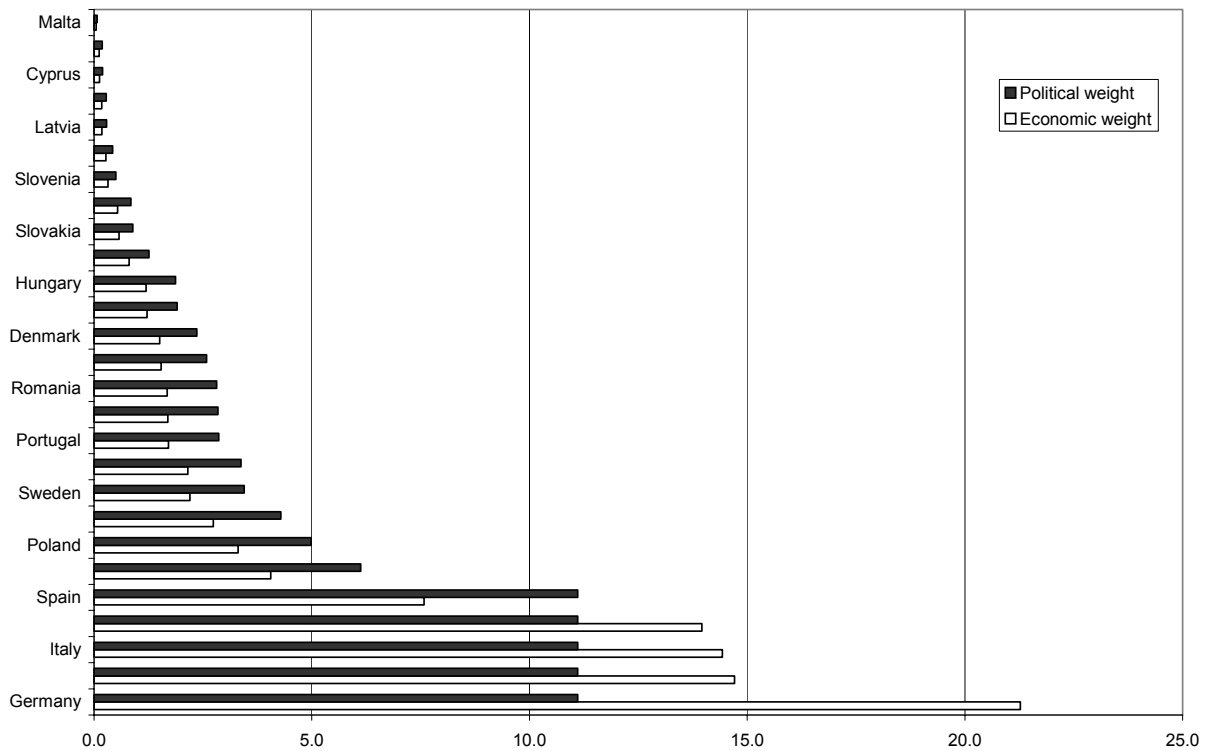
How does the example fare with regard to the ratio of *political and economic weights* of central bank governors?<sup>21</sup> As Figure 4 reveals, except for the largest four countries, all 27 central bank governors still hold a political weight (i.e. vote share) that exceeds the economic weight of their respective country in this rotation scenario. However, the mismatch is substantially lower in terms of magnitude (cf. the lower

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<sup>21</sup> Political weights have been computed by multiplying the rotation frequencies with the overall number of Council seats. Based on 9 selected governors and 6 Board members, the ECB Council would have 15 members. The rotation frequencies are defined in equivalents of a permanent Council seat. A frequency of 0.5, for example, indicates that a particular governor will participate in half of all ECB Council meetings—e.g., occupy a Council seat every second year or participate in every second meeting depending on the specific implementation of the scheme.

part of Figure 2). Another way to show the mismatch is the sum of the squared differences between the economic and political weights. In calculating this measure, we assume that the Board casts its votes based on a GDP-weighted average of the euro area. This means that a country's political weight is determined by its own vote share as well as the Board's vote share to the extent of the economic weight of that country in the euro area. The third row of Table 5 shows the outcomes of this measure under the various rotation schemes that we discuss. It is clear, that our first rotation scheme scores best, i.e. the mismatch is lowest.

**Figure 4. Economic and political weights with size-based grouping (option size 1)**



However, *group selection by size* may make groups heterogeneous along other dimensions. There is, for instance, reason to assume that *business cycles* are more closely correlated and *structural inflation* performance is more closely linked in some economic regions or within groups of countries of differing size. Indeed, the first column of Table 5 shows that the average within-group standard deviation of inflation is 3.31, which is relatively high in comparison to other rotation schemes despite the fact that 5 out of 9 groups feature a single member only.

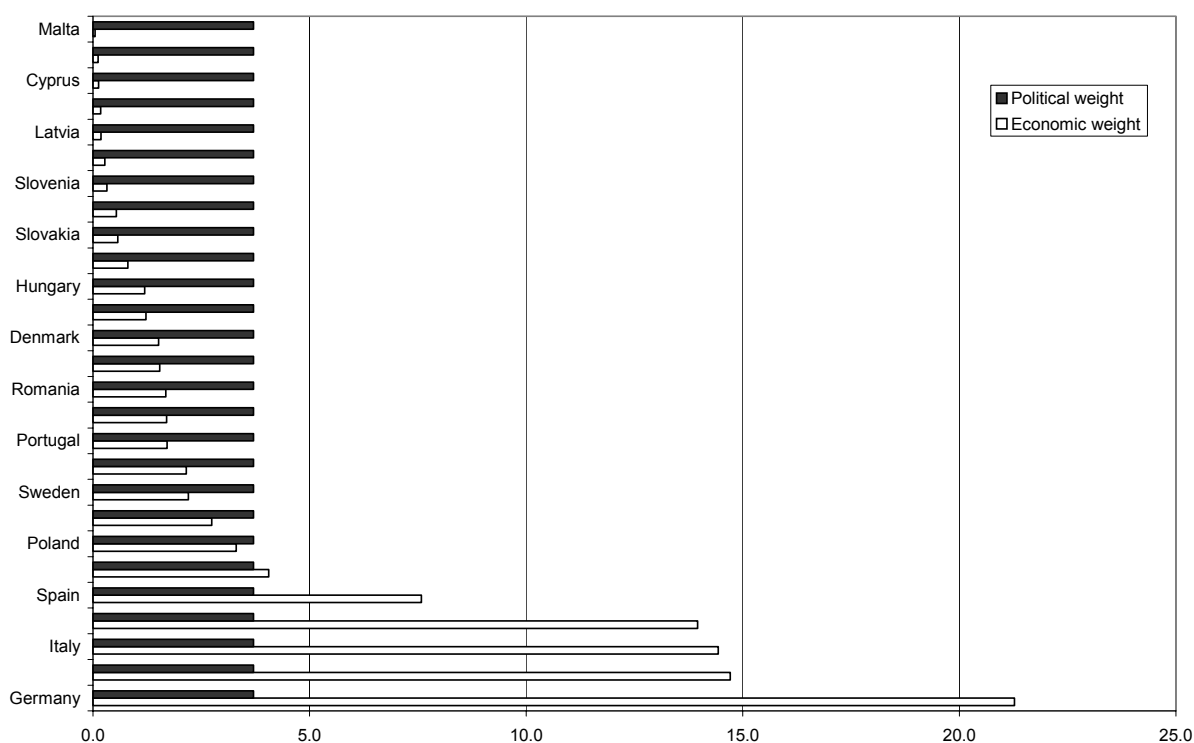
Furthermore, in order to maximize GDP representation, it is necessary to give a *permanent seat* to the ‘big five’. This is probably politically unacceptable for a majority of the current EU member states. In *option size 2*, we therefore try to take the political objections into account, while still securing sufficient representation of the euro area GDP in the Council. In this scenario, all countries have to rotate, including the ‘big five’. We assume that the latter have to share 4 seats, while the four next largest countries (Belgium, the Netherlands, Poland and Sweden) have to share two seats. The remaining three seats are occupied by groups of 3 (Austria, Greece, and Portugal), 4 (Czech Rep., Denmark, Finland and Romania) and 11 countries. Consequently, the area represented in the Council is somewhat lower (almost 69 per cent) than in the previous option, while the minimum and maximum share represented are 58.5 and 76.7 per cent, respectively (see column 2 of Table 5). The mismatch between economic and political weights is somewhat higher. Still, under this option the majority of the euro area is represented in the Council at any time. As was to be expected, abolishing single-member groups yields a higher average within-group standard deviation of inflation (5.41). Likewise, the within-group standard deviation of business cycle correlation with EU12 is higher (0.20), while the average within-group business cycle correlation is lower (0.29) than in the first option.

Although this scenario takes as its starting point that all countries have to rotate, the rotation is still asymmetric, which may be hard to accept by all EU members. After all, the current ECB set-up is based on *equal treatment* of all countries. In *option size 3*, we therefore assume equal rotation for all members. This leads to 9 groups of equal size. Germany, France and Italy are in one group, just like Spain, the Netherlands and the UK. As a result, in this scenario, on average every central bank has a probability of occupying a seat of 33.3 per cent. An obvious advantage of this approach is that all countries are treated in the same way. By the

same token, however, the average share of the euro area's GDP covered is, on average, only 33.33 per cent, while the minimum and maximum shares represented are 25.2 and 44.5 per cent, respectively. Thus, from the perspective of minimizing the risk of distorted policy-making, this is clearly not an attractive option. As Figure 5 illustrates, under all groupings with equal rotation, the match between economic and political weights is less than under the grouping with unequal rotation based on size (option size 1). The sum of squared differences between economic and political weights is substantially higher than under the previous rotation schemes.

In addition, the equal rotation option based on size – while ensuring that groups are homogenous regarding the share of euro area GDP represented by each group member and, thus, securing a high minimum representation of euro area GDP – implies a rather high average within-group standard deviation of inflation and low business cycle correlation within the groups (see Table 5). Heterogeneity along these lines could pose a number of problems for ECB decision making if country representatives paid at least some attention to national economic developments. The higher the within-group heterogeneity, the more likely it would be that the priorities of group representatives would change with each rotation of the group's voting right into new hands, possibly introducing unwelcome volatility in ECB decision-making. While this problem is present in size-based asymmetric rotation scenarios as well, it is amplified by the introduction of symmetric rotation. The reason is that symmetric rotation increases the number of rotations and, thus, the number of national central bank governors that is involved in ECB decision-making in any given period of time.

**Figure 5. Economic and political weights in groupings with equal rotation**



The final options we discuss also take equal rotation as its starting point, but try to improve upon the within-group characteristics. They are based on the minimization of the within-group standard deviation of inflation and maximization of the within-group business cycle correlation. In other words, we group countries on the basis of similar inflation rates and business cycles. As before, due to the equal rotation principle, rotation is based on 9 groups of 3 countries. It is interesting to note that the *inflation* rotation scheme results in groupings that – at first sight – could seem counter-intuitive to some. For instance, the Netherlands ends up in one group with Italy.<sup>22</sup> The average within-group business cycle correlation is somewhat higher than under option size 3, but still rather low (0.23), which suggests that factors in addition to business cycle synchronization contribute to inflation differentials within our group of countries. On the other hand, organizing groups on the basis of equal rotation with a view to maximization of the within-group *business cycle correlations*, while yielding a higher correlation (0.41), leads to higher within-group heterogeneity with regard to inflation.

<sup>22</sup> EU-commissioner Bolkenstein, who at the time of the decision of EMU membership was the leader of the liberal party in the Dutch parliament, argued that the Netherlands should not join EMU if Italy was allowed in, given the weak fundamentals in Italy.

As mentioned earlier, the result that the first two reform options yield relatively high within-group business cycle correlations is caused by the fact that these options allow for asymmetric group sizes. Also, note that the fifth rotation scheme yields a relatively low standard deviation of business cycle correlation with the EU12, which is probably caused by the fact that countries that have a diverging business cycle vis-à-vis the EU 12 are grouped together in this scheme. The final rotation options have very low minimum shares of the euro area represented (6.4 per cent under the inflation rotation scheme and 11.3 per cent under the business cycle correlation scheme).

To sum up, Table 5 suggests that the selection of countries into rotation-groups involves a number of decisions and tradeoffs. First, it is obvious that the *representation* of the euro area GDP suffers substantially if all countries are forced to rotate at an equal frequency. Equal rotation implies a higher mismatch between economic and political weights than unequal rotation. Second, while it would seem that asymmetric rotation in combination with group selection by size goes a long way to secure within-group homogeneity with regard to inflation and business cycle correlation, there are some costs as well. A comparison of the result for rotation schemes (3) to (5) shows that, holding rotation frequencies equal across countries and constant, group selection by size secures a relatively high minimum representation of euro area GDP in the ECB Council but also leads to relatively higher within-group volatility for business cycle correlation and inflation. Third, there is an additional tradeoff between selecting group members for rotation based on either of the latter categories: higher within-groups business cycle coherence comes at the price of higher inflation dispersion and vice versa. Fourth, looking at average correlation with the EU12 business cycle across groups in rows (3) to (5), we find that selecting countries either by size or inflation performance increases the similarity with the average business cycle.

The overall picture that emerges is broadly favorable for an asymmetric rotation scheme in the spirit of scheme (1). While not aiming at minimizing within-group inflation volatility or maximizing within-group business cycle correlation, an asymmetric rotation scenario that allows single-country groups fares almost as well regarding these criteria as rotation schemes (4) and (5). However, to the extent that political feasibility considerations would force all countries into rotation along the lines of scheme (2) – or even into fully symmetric rotation as in schemes (3) to (5) –, the reform of the ECB decision-making framework faces a three-way tradeoff

between securing a sufficient representation of euro area GDP in the ECB Council, the homogeneity of the inflation, and the business cycle performance of the selected rotation groups.

## **5. The ECB Proposal**

In late 2002 – after the initial draft of the paper was presented – the ECB published its proposals for reform of the ECB after enlargement of EMU. The proposal will be considered by the EU Council in the spring of 2003. Like in the rotation schemes considered above, the ECB proposal puts a limit on the number of central bank governors exercising a voting right. In contrast to reform options (1) to (3), however, the ECB puts this maximum at 15, instead of 9. From a *decision-making costs* perspective, this may be considered as a rather high number. It also reduces the voting weight of the Board from 40 to less than 30 percent.

The ECB proposes that, initially, there will be two groups with rotating voting rights. Once there are 22 euro area Member States, there will be three groups sharing Council seats by rotation. The ECB suggests basing the allocation of central banks to the groups on a ranking of their share in the euro area according to a so-called composite indicator of “representativeness”. The principal component of this composite indicator will be the Member State’s GDP. The second component will be the total assets of the aggregated balance sheet of monetary financial institutions (“TABS-MFI”) within the territory of the Member State concerned.<sup>23</sup> The relative weights of the two components are 5/6 for GDP and 1/6 for TABS-MFI.

In particular, the ECB proposes that the first group will include the central bank governors from the five largest euro area Member States according to the ranking of the representativeness indicator (the ‘big five’). This group will have four votes. The second group, with eight voting rights, will consist of half of all national central bank governors selected from the subsequent positions in the ranking. The third group will be composed of the remaining governors. They will share three voting rights.

For comparison purposes, we will focus on the outcomes of the ECB proposal under the situation with 27 members. Our calculations are based on a ranking of GDP

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<sup>23</sup> The measure is likely to favor member countries with a relatively large financial sector and a small GDP share, like Luxembourg.

only, as information on the second element of the “representativeness” indicator is not yet available. Based on the GDP component of the measure alone, the second group will encompass the following countries: Austria, Belgium, Czech Rep., Denmark, Finland, Greece, Hungary, Ireland, the Netherlands, Poland, Portugal, Romania, Slovakia, and Sweden.

The final column in Table 5 compares the ECB proposal with the size-based reform options (1) to (3) as presented in the previous section. Interestingly, the average share of GDP represented is quite high under the reform as proposed by the ECB, even somewhat higher than under reform option (2), which fared “second best” in the discussion in Section 4 under the constraint that all Council members rotate (73 versus 68 per cent). However, in terms of within-group characteristics, reform option (2) outperforms the ECB proposal. The reason for the higher volatility is that there is a smaller number of groups, so the within-group variability will be higher. Furthermore, the mismatch between the economic and political weight is larger under the ECB proposal than in option (2). In part, the mismatch measure reflects the fact that the Board has a smaller voting share than in our preferred option (40 versus less than 30 percent). As a result, the mismatch between economic and political weights under the ECB proposal is even bigger than under the ‘equal rotation’ scenario (3).

In conclusion, the ECB proposal shows a remarkable resemblance to reform option (2), our preferred option for reform. Both schemes are based on rotation and the principle of “one person one vote” applies to central banks with voting rights. In both proposals, the governors of the ‘big five’ have a considerably larger chance of having the right to vote than the other central bank governors. Under the ECB proposal for reform, the average share of GDP represented in the Governing Council of the ECB is slightly higher than in option (2). However, in terms of the mismatch between economic and political weight the preferred reform scheme performs better than the ECB proposal. This is largely due to the larger number of groups and the stronger position of the Board in the Governing Council suggested by scheme (2).

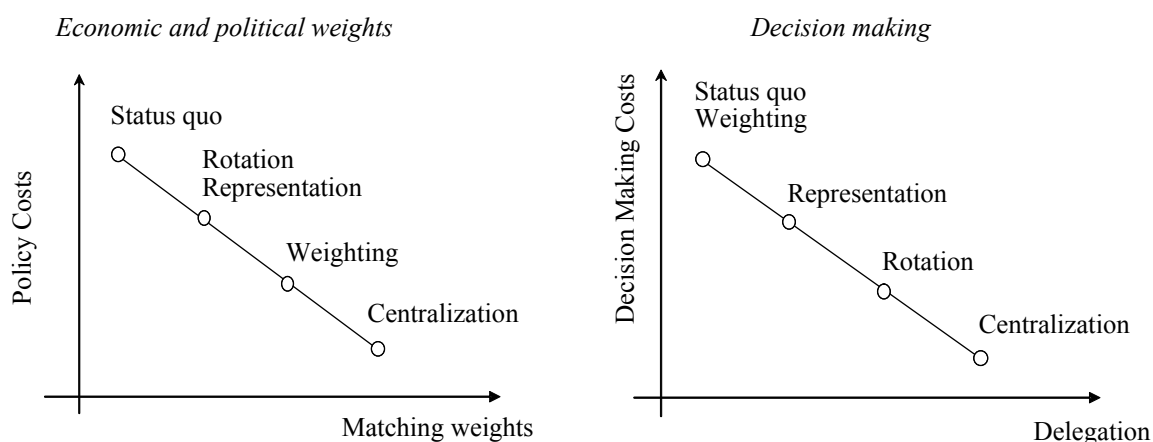
## **6. Concluding comments**

Enlargement will change the way monetary policy is made in the euro area. Within a few years, membership could more than double, with the majority of accession countries being small in economic terms compared with current members. In the



absence of a reform of the ECB, such a significant but asymmetric expansion is likely to increase decision making-costs and to lead to a mismatch between the economic and political weight of national central banks in the ECB Council. In this paper we have discussed various options for reform, including the ECB proposal of late 2002. We argue that, while centralization could be a “first best” solution in more than one way, a number of political-economic arguments speak against it. The “second-best” solution is to match economic size and voting power. One way to implement this principle – even if imperfect in practice – is to introduce a rotation scheme for national central bank governors, which takes economic differences between the member countries into account. Alternative reform options to improve the match between economic and political power include forms of representation (including the possibility of introducing regional central banks encompassing multiple national central banks) and weighted voting. But, while both vote-weighting and representation could ensure that ECB Council members carry a political weight roughly in proportion to economic size, the large number of policy-makers involved under these reform scenarios (directly or indirectly) is a reason for concern. Approaches that aim at the centralization of decision-making power or its reallocation by means of an asymmetric rotation scheme promise to address not only the possible wedge between the economic and political weights of Council members but also the issue of decision costs. Figure 6 illustrates these arguments by comparing the relative merits of the above-mentioned reform options with regard to decision-making costs and the possible problems stemming from the mismatch between political and economic power of euro area member countries.

**Figure 6. Costs of Status Quo and Reform Scenarios—A Stylized View**



Source: Berger (2002), Table 4.

*Notes:* Policy costs entail deviations from the “first best” policy due to a mismatch between the political and economic weights of central bank governors in the ECB Council, and *Matching weights* describes the reduction of this mismatch. *Decision making costs* are as defined in Section 2; *Delegation* describes the process of delegating voting power from central bank governors to (fewer) delegates through various institutional means. The assumed negative (but not necessarily linear) relations in both graphs have been explored in the previous sections. The specific positioning of the various reform scenarios is should be interpreted in qualitative terms.

To be sure, alternative reform scenarios might be imagined and many of the more detailed institutional design questions involved can be answered in more than one way. For instance, a crucial question is whether to base rotation on a symmetric or asymmetric (size-based) framework. In an equal rotation scheme, countries present in the ECB Council represent, on average, just 50 per cent of the euro area GDP; clearly not an attractive feature. We therefore prefer a system with unequal rotation, be it a system with a permanent seat for the five large countries, or a system in which all countries rotate, but where large countries rotate with a lower frequency than the small countries.

The reform proposal presented by the ECB in late 2002 also comprises an asymmetric rotation scheme. While the ECB proposal performs well with regard to many of the criteria discussed in the present paper, it is not without drawbacks. In

particular, the proposal foresees an enlargement of the Council, which is not attractive from a decision-making costs perspective. It also implies a reduction in voting power of the Board. Notwithstanding these caveats, the ECB proposal goes a long way in addressing the fundamental problems of euro-area enlargement.

## References

- Artis, M. J. and Zhang, W., 1999, Further evidence on the international business cycle and the ERM: Is there a European business cycle?, *Oxford Economic Papers*, 51, 120-132.
- Backé, P., J. Fidrmuc, T. Reininger and F. Schardax, 2002, Price dynamics in Central and Eastern European EU Accession Countries, Oesterreichische Nationalbank, Working Paper, No. 61.
- Baldwin, R., E. Berglof, F. Giavazzi, and M. Widgren, 2000, EU Reforms for Tomorrow's Europe, CEPR Discussion Paper, No. 2623.
- Baldwin, R., E. Berglof, F. Giavazzi, and M. Widgren, 2001, Preparing the ECB for Enlargement, CEPR Policy Paper, 6, CEPR, London.
- Berger, H., 2002, The ECB and Euro-Area Enlargement, IMF Working Paper, No. 02/175.
- Berger, H. and J. de Haan, 1999, A State Within a State? An Event Study on the Bundesbank, *Scottish Journal of Political Economy*, 46(1), 17-39.
- Berger, H. and J. de Haan, 2002, Are Small Countries too Powerful Within the ECB?, *Atlantic Economic Journal*, 30 (3), 1-20.
- Bindseil, U., 2001, A Coalition-Form Analysis of the "One Country-One Vote" Rule in the Governing Council of the European Central Bank", *International Economic Journal*, 15(1), 141-64.
- Blanchard, O. and D. Quah, 1989, The Dynamic Effects of Aggregate Demand and Supply Disturbances, *American Economic Review*, 79(4), 655-73.
- Coricelli, F. and B. Jazbec, 2001, Real Exchange Rate Dynamics in Transition Economics, CEPR Discussion Paper, No. 2869.
- Crespo-Cuaresma, J., M. Dimitz, and D. Ritzberger-Grünwaldz, 2002, Growth, Convergence and EU Membership, Mimeo, Austrian National Bank.
- De Broeck, M. and T. Sloek, 2001, Interpreting real exchange rate movements in transition countries, IMF Working Paper, No. 01/56.
- Deutsche Bundesbank, 1992, Monthly Report (August), Frankfurt.
- Égert, B., 2002a, Estimating the impact of the Balassa-Samuelson effect on inflation and the real exchange rate during the transition, *Economic Systems*, 26(1), 1-16.
- Égert, B., 2002b, Investigating the Balassa-Samuelson Hypothesis in the Transition. Do We Understand What We See? A Panel Study, *Economics of Transition*, 10(2), 273-309.
- Eichengreen, B. and F. Ghironi, 2001, EMU and Enlargement, University of Berkley, Mimeo, May.
- Eichengreen, B., 1992, Designing a Central Bank for Europe: A Cautionary Tale from the Early Years of the Federal Reserve System, in: M. Canzoneri, V. Grilli, and R. Masson (ed.), *Establishing a Central Bank in Europe and Lessons from the US*, Cambridge, Cambridge University Press, 13-40.
- Eijffinger, J. and J. de Haan, 2000, *European Monetary and Fiscal Policy*, Oxford, Oxford University Press.
- European Central Bank (ECB), 1999, The Institutional Framework of the European System of Central Banks, *Monthly Bulletin*, July, 55-63.
- Eurostat, 2001, Candidate countries: Labour productivity levels and remuneration levels just over 40% of EU average, News release 55.
- Fidrmuc, J. and I. Korhonen, 2001, Similarity of Supply and Demand Shocks Between the Euro Area and the CEECs, Bank of Finland, BOFIT Discussion Papers, No. 14.

- Fischer, S, R. Sahay, and C. Vegh, 1998a, From Transition to Market: Evidence and Growth Prospects, IMF Working Paper, No. WP/98/52.
- Fischer, S, R. Sahay, and C. Vegh, 1998b, How Far Is Eastern Europe from Brussels?, IMF Working Paper, No. WP/98/53.
- Friedman, M. and A.J. Schwartz, 1963, *A Monetary History of the United States, 1867-1960*, Princeton, Princeton University Press.
- Gros, D. and C. Hefeker, 2002, One Size Must Fit All: National Divergences in a Monetary Union, *German Economic Review*, 3 (3), 247-62.
- Havrylyshyn, O., 2001, Recovery and Growth in Transition: a Decade of Evidence, *IMF Staff Papers*, 48 (Special Issue), 53-87.
- Halpern, L. and C. Wyplosz, 2001, Economic Transformation and Real Exchange Rates in the 2000s: The Balassa-Samuelson Connection, mimeo, March.
- Heinemann, F. and F.P. Huefner, 2002, Is the View from the Eurotower Purely European? National Divergence and ECB Interest Rate Policy, mimeo, Centre for European Economic Research, Mannheim.
- IMF, International Financial Statistics, August 2002
- Inklaar, R. and De Haan, J., 2001, Is there really a European Business Cycle: A comment, *Oxford Economic Papers*, 53, 215-220.
- Lohmann, S., 1997, Partisan Control of the Money Supply and Decentralized Appointment Powers, *European Journal of Political Economy*, 13, 225-46.
- Lohmann, S., 1998, Federalism and Central Bank Independence: The Politics of German Monetary Policy, 1957-1992, *World Politics*, 50, 401-46.
- Meade, E. and D.N. Sheets, 2002, Regional Influences on U.S. Monetary Policy: Some Implications for Europe, London, LSE, Centre for Economic Performance Discussion Paper No. 523, .
- OECD (2002), Purchasing Power Parities and Real Expenditures, 1999 benchmark year, OECD: Paris.
- Pelkmans, J., D. Gros, and J. Ferrer, 2000, Long-Run Economic Aspects of the European Union's Eastern Enlargement, WRR Scientific Council for Government Policy Working Paper, No. 109.
- Rogers, J.H., 2001, Price Level Convergence, Relative Prices and Inflation in Europe, Board of Governors, Federal Reserve System, International Finance Discussion Paper No. 699.
- Rother, C.P. (2000), The Impact of Productivity Differentials on Inflation and the Real Exchange Rate: An Estimation of the Balassa-Samuelson Effect in Slovenia, IMF Country Report No. 00/56, 26-39.
- Szapary, G., 2000, Maastricht and the Choice of the Exchange Rate Regime in Transition Countries During the Run-up to EMU, NBH Working Paper, No. 7.
- Sinn, H.W. and M. Reutter, 2001, The Minimum Inflation for Euroland, NBER Working Paper, No. 8085.
- The Economist, 1998, Euro Towers or Fawltly Towers?, October 31, 85-6.
- University of Groningen and The Conference Board, GGDC Total Economy Database, 2002, [www.eco.rug.nl/ggdc](http://www.eco.rug.nl/ggdc)
- Von Hagen, J. and J. Süppel, 1994, Central Bank Constitutions for Federal Monetary Unions, *European Economic Review*, 38, 774-82.

## Appendix 1. A simple analytical framework

Berger (2002) develops a simple Barro-Gordon type model of monetary policy making within an enlarged euro area that illustrates some of the potential problems involved. Output in the “in” and “out” regions comprising the euro area after enlargement develops according to a Lucas-supply function

$$(1) \quad y_i = \pi_i - \pi_i^e + \varepsilon_i; \quad i = in, out,$$

where  $y$  measures output,  $\pi$  (headline) inflation,  $\pi^e$  (headline) inflation expectations, and  $\varepsilon$  is a regional output shock with zero mean and known variance. Natural output has been normalized to 0. Headline inflation is the sum of inflation in the tradable-goods sector,  $\tilde{\pi}$ , assumed to be under direct and full control of the ECB, and a region-specific structural (exogenous) component,  $\Delta_\pi$ :

$$(2) \quad \pi_i = \tilde{\pi} + \Delta_{\pi,i}; \quad i = in, out.$$

The simplest possible representation of decision-making within the ECB Council is a bargaining approach that abstracts from possible strategic interaction between Council members. Along this line, the ECB Council sets tradable-goods inflation in the euro area by weighing the preferred policies of the Board and the national central bank governors:

$$(3) \quad \tilde{\pi}_{ECB} = b\tilde{\pi}_{Board} + (1-b)\tilde{\pi}_{NB},$$

with  $b \in [0,1]$  measuring the political weight or, to be precise, the overall vote share of Board members in the Council and  $\tilde{\pi}_{Board}$  and  $\tilde{\pi}_{NB}$  representing the Board’s and the governor’s preferred tradable-goods inflation rate, respectively. Since the vote shares of the “in” and “out” region might differ, the preferred policy of the national central bank governors is equivalently described as

$$(4) \quad \tilde{\pi}_{NB} = \gamma\tilde{\pi}_{in} + (1-\gamma)\tilde{\pi}_{out},$$

where  $\gamma \in [0,1]$  measures the relative voting power of the “in” region. Thus the overall vote share or bargaining power, with which the interests of all parties involved enter into the ECB decision-making process, are: for the “in” region  $(1-b)\gamma$ ; for the “out” region  $(1-b)(1-\gamma)$ ; and for the Board  $b$ .

The “in” region’s central bank’s ideal monetary policy is assumed to follow from a standard quadratic loss function that increases in the deviations of the region’s headline inflation and output from targets set to 0.

$$(5) \quad L_{in} = \pi_{in}^2 + \lambda y_{in}^2.$$

The relative weight of the real target is  $\lambda > 0$ . It is assumed that the “out” region’s central bank follows a more ambitious output target,  $y_{out}^* > 0$ , while the weight associated with output losses,  $\lambda$ , as well as its inflation target is the same as in the “in” region:

$$(6) \quad L_{out} = \pi_{out}^2 + \lambda(y_{out} - y_{out}^*)^2.$$

Using equations (1), (2), (5), and (6), it is straightforward to derive the preferred policies of both regions. As Berger (2002) shows, the preferred policy of the “out” region differs from that of the “in” region in two respects. First, the more ambitious

output target implies a higher rate of inflation. Second, to compensate for the presence of structural inflation the “out” region’s central bank aims for lower tradable-goods inflation..

It is assumed that the *Board* chooses monetary policy to minimize a loss function based on economically weighted euro area averages of headline inflation and output—arguably in line with the policy targets specified in the Maastricht treaty:<sup>24</sup>

$$(7) \quad L_{Board} = [\chi\pi_{in} + (1-\chi)\pi_{out}]^2 + \lambda[\chi y_{in} + (1-\chi)y_{out}]^2,$$

where  $\chi \in [0,1]$  is the economic weight (e.g., the share in aggregate euro area GDP of the “in” region). Using again equations (1) and (2), it is easy to show that this implies that the higher the inflation in the “out” region is and the higher the region’s impact on euro area inflation, the lower the Board will set tradable-goods inflation to compensate the impact of structural inflation in the “out” region on the overall euro area inflation rate.

Berger (2002) shows that under this set-up and assuming rational expectations, *equilibrium inflation in the euro area* will be:

$$(8) \quad \begin{aligned} \tilde{\pi}_{ECB} = & -b(1-\chi)\Delta_{\pi,out} + (1-b)(1-\gamma)(\lambda y_{out}^* - \Delta_{\pi,out}) \\ & - \frac{\lambda}{1+\lambda} ([b\chi + (1-b)\gamma] \varepsilon_{in} + [b(1-\chi) + (1-b)(1-\gamma)] \varepsilon_{out}). \end{aligned}$$

The first part on the right hand side reflects the Board’s intention to compensate for the “out” region’s structural inflation by lowering tradable-goods inflation—weighted by  $b$ , the Board’s vote share in the ECB Council. The second element in (8) summarizes the conflicting policy objectives of the “out” region itself. On the one hand, the region’s central bank, too, aims at decreasing tradable-goods inflation to compensate for its higher structural inflation rate ( $-\Delta_{\pi,out}$ ), on the other, the presence of a more ambitious growth target gives rise to an inflationary bias ( $\lambda y_{out}^*$ ). The net effect of these competing forces on equilibrium inflation depends on the ambitiousness of the “out” region’s growth target, the importance of the output target in its loss function, and the size of its structural inflation problem. Finally, the third element on the right hand side of equation (8) shows that the ECB will shift tradable-goods inflation in the euro area to counter regional output shocks. The weight allocated to either region’s output shock is the sum of the weights attached to output stabilization in the relevant region by the respective central bank (i.e.,  $(1-b)(1-\gamma)$  for the “out” and  $(1-b)\gamma$  for the “in” region) and the Board (i.e.  $b\chi$  in case of the “in” and  $b(1-\chi)$  in case of the “out” region).

How does actual monetary policy in the euro area as described in equation (8) deviate from a benchmark policy that would be implemented if all Council members were solely interested in targets specified by the Maastricht treaty? A reasonable benchmark policy rule along this line is one that stabilizes economically-weighted euro area averages of output and inflation around zero, i.e., that—on average—keeps prices stable and output at its natural level:

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<sup>24</sup> This is *not* to imply that only national central bank governors might take into account “national” policy goals in addition to the targets specified in the Maastricht treaty. The basic results of the model only require a *more* European perspective on the side of the Board.

$$(9) \quad \tilde{\pi}^* \equiv \arg \min L^* = [\chi \pi_{in} + (1 - \chi) \pi_{out}]^2 + \lambda [\chi y_{in} + (1 - \chi) y_{out}]^2 \text{ s.t. (1) and (2).}$$

In words,  $\tilde{\pi}^*$  is the rate of tradables inflation that minimizes the loss function  $L^*$  subject to equations (1) and (2).<sup>25</sup> If monetary policy were conducted in line with this rule, introducing rational expectations would yield equilibrium tradables inflation of

$$(10) \quad \tilde{\pi}^* = -(1 - \chi) \Delta_{\pi, out} - \frac{\lambda}{1 + \lambda} (\chi \varepsilon_{in} + (1 - \chi) \varepsilon_{out}).$$

A comparison of the benchmark euro area policy with actual ECB policy as depicted by equation (8) reveals a number of crucial differences:

- average tradables *inflation* as described by equation (8) will, in general, deviate from the benchmark (10). This is always true as long as  $\lambda y_{out}^* \neq \Delta_{\pi, out}$ . In particular, inflation is likely to exceed the inflation rate achieved under the benchmark policy, if the inflationary bias introduced by the “out” region’s central bank is high relative to the region’s structural inflation problem, i.e.  $\lambda y_{out}^* > \Delta_{\pi, out}$ . Moreover, inflation in the euro area will be the higher, the higher is the political weight of the “out” region in the ECB Council.
- actual *stabilization policy* will, as a rule, not be optimal. In particular, it is straightforward to show that if the “out” region’s political weight in actual ECB decision making deviates from its economic weight and output shocks in the “in” and “out” region do not coincide, the ECB’s stabilization efforts will deviate from the “first best” benchmark.

One way to ensure that actual ECB policy adheres to the benchmark policy is to give the *Board sole authority setting monetary policy in the euro area*. This is a direct implication of the assumption that the Board follows the policy ideals of the Maastricht treaty, i.e. seeks to minimize a euro area loss function based on economically weighted averages. If the Board does not hold full authority over monetary policy, a “second best” solution to bring actual ECB policy closer to the benchmark is to ensure that the *political weight of the countries represented in Council is in line with their economic weight*. Decreasing the mismatch between economic and political weights would bring actual stabilization policy closer to the benchmark and, if the “out” region was politically over-represented before, reduce actual inflation. In fact, perfectly matching political and economic weights would even guarantee that actual stabilization policy is perfectly in line with the ideal policy of stabilizing the euro area business cycle based on a correctly weighted average of the underlying regional cycles. If perfect matching is not feasible, a “third best” solution would be bring the political weights of national central banks as closely as possible in line with their economic weight (see Berger 2002, for further details).

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<sup>25</sup> Note that, by construction, the loss function in the “first best” policy program is similar to the Board’s loss function (7).



## **Appendix 2. Data sources and methods of calculation**

The data-set we use in this paper comes from a variety of sources, but the main source is the IMF's International Financial Statistics (IFS, <http://imfStatistics.org>). From the IFS, we took data on industrial production and inflation for most countries. Another important source is the GGDC Total Economy Database ([www.eco.rug.nl/ggdc](http://www.eco.rug.nl/ggdc)).

For industrial production, we rely on monthly data for the period 1985-2001 for the current 15 EU members and the period 1990-2001 for the 12 accession countries. For a number of accession countries, no data were available in IFS, or only for a subset of the 1990-2001 period. Also, a number of these countries do not report seasonally adjusted figures. First of all, no data were available in IFS for Bulgaria, Estonia, Latvia, Malta and Slovakia, while for Poland, the data stop at the end of 1995. The Central Statistical Bureau of Latvia reports (seasonally adjusted) industrial production on a monthly basis from 1995 onwards. The Statistical Office of Estonia does not publish long time-series for industrial production, but industrial sales are available on a monthly basis from 1994 onwards. Using sales instead of production eliminates part of the cyclical behavior, since inventory adjustments are not taken into account, so the figures for Estonia should be regarded with caution. Finally, data for Slovakia and a longer time series for Poland were available from the Vienna Institute for International Economic Studies (WIIW). The WIIW also reports data for Bulgaria, but (visual) inspection of this series raised questions on the reliability. The very rapid inflation and the subsequent problems with deflating industrial production provide a further basis for doubting these data. We therefore dropped this series and do not report any business cycle correlations for Bulgaria, nor for Malta since we could not find any data on industrial production for this country.

Next, we seasonally adjusted the industrial production figures for Cyprus, the Czech Rep., Estonia, Hungary, Lithuania, Poland, Romania and Slovakia using the Census X12 procedure from the U.S. Census Bureau as reproduced in EVIEWS 4.0. In the case of Ireland, the IFS data revealed a large structural break around 1995. To solve this problem, we took the monthly industrial production figures from the Irish Central Statistics Office, which run from 1995 onwards and applied the growth rates from IFS to all the months before January 1995. Finally, Portugal showed anomalous industrial production figures and a gap in the series between July 1994 and February 1995. We interpolated these months linearly. This eliminates cyclical behavior, but since this is only for a short period, it is unlikely to pose large problems. The following table shows the beginning and end dates for our series:

**Table A2.1 Starting and end dates for monthly data on Industrial Production**

EU15 Members			Accession Members		
<i>Country</i>	<i>First month</i>	<i>Last month</i>	<i>Country</i>	<i>First month</i>	<i>Last month</i>
Austria	Jan-85	Feb-01	Bulgaria	n/a	n/a
Belgium	Jan-85	Dec-00	Cyprus	Jan-90	Dec-01
Denmark	Jan-85	Dec-01	Czech Rep.	Jan-90	Dec-01
Finland	Jan-85	Dec-01	Estonia <sup>a)</sup>	Jan-94	Dec-01
France	Jan-85	Dec-01	Hungary	Jan-90	Dec-01
Germany	Jan-85	Dec-01	Latvia	Jan-95	Dec-01
Greece	Jan-85	Jan-02	Lithuania	Jan-93	Dec-01
Ireland	Jan-85	Dec-02	Malta	n/a	n/a
Italy	Jan-85	May-02	Poland	Jan-90	Jun-01
Luxembourg	Jan-85	Jul-00	Romania	May-90	Dec-01
Netherlands	Jan-85	Dec-02	Slovakia	Jan-93	Dec-01
Portugal	Jan-85	Nov-00	Slovenia	Dec-91	Dec-01
Spain	Jan-85	Dec-02			
Sweden	Jan-85	Jan-00			
UK	Jan-85	Dec-02			

<sup>a)</sup> Data on industrial sales instead of industrial production.

We also form a weighted euro-area index where we choose June 1995 as 100 and extrapolate forwards and backwards using the GDP-weighted growth rates of the 12 euro-area countries. We chose to use this method for the whole period, since our method yields somewhat different results than the official series, which is published since January 1999 onwards. Possible reasons are the use of PPPs to weight the individual countries and the fact that we use GDP weights instead of value added in manufacturing weights. However, differences are not large and this ensures comparability with the EU12 indices we also calculate excluding each country consecutively.

To decompose these series into a trend and a cyclical component, we filtered them using a Hodrick-Prescott filter with smoothing factor  $\lambda=14400$  (the suggested value for monthly data). To minimize the end-point problems, which are present with all filters, we forecast the series for a full year assuming all series follow an AR(3) process. We use the trend series to calculate the cyclical component in each month as one plus the percentage deviation from trend in that month. Pair wise correlations for each country-couple (including the euro area) are then calculated. We also calculate a set of correlations for the euro area countries, where we exclude the country in question from the euro area index.

Inflation is derived as the annualized average monthly change in the Consumer Price Index (CPI). All data on the CPI are from the IFS. We follow a similar procedure as for industrial production to calculate euro area inflation before 1999 and EU15 and EU27 inflation for the whole period.

Our main source on GDP is the GGDC Total Economy Database. This database contains data on (real) GDP for a large number of countries converted at PPP to U.S. dollars. Since conversion to U.S. dollars using Purchasing-Power-Parities (PPPs) eliminates differences in the relative price level of countries, the resulting GDP levels can safely be compared. If we were to convert the GDP levels into a common currency using exchange rates, this would generally not be the case. The database does not cover

all countries in our sample, and in particular a number of the accession countries are not covered. For those countries, we take GDP in current and constant prices from the IFS. We convert these from national currency to U.S. dollars using PPPs as published by the OECD (2002). Since these PPPs are for 1999, while the PPPs for the other countries are for 1996, we use the change in the country's price level relative to that in the U.S. to calculate 1996 PPPs. These are then used to calculate GDP in U.S. dollars. We had to follow this procedure in the case of Luxembourg, Cyprus, Estonia, Latvia, Lithuania and Malta. GDP levels for the euro area, EU15 and the hypothetical EU27 are then calculated by summing the GDP levels of the relevant countries over each of the years. In constructing euro area, EU12 and EU15 industrial production and inflation, we use the GDP weight for a specific year for each month in that year.

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