ECB Governance in an Enlarged Eurozone

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Abstract

We study the rotation rule decided by the European Council for the functioning of the ECB Governing Council after EMU enlargement. Desired interest rates by each member of the Governing Council are calculated on the basis of Fisher, truncated Taylor and Taylor rules successively, and on the basis of a convergence of both GDP per capita and price levels within the EU in 30 years. Then, various decision rules are simulated. We show that moving from the "old" rule (where each member of the Governing Council has a vote at each meeting) to the "new" one (where, at a given meeting, only 15 national governors have a vote) does not have much impact on the decisions made by the Governing Council in an enlarged Eurozone. However, should rotations be relatively infrequent, the system could end up close to a constituency system. In this case, core Euro12 countries could be better off in a Euro25 than in the Euro12, because they would be in the position of imposing lower interest rates. But core Euro12 would be worse off in a Euro22 (EU25 less Denmark, Sweden and the UK) compared to a Euro12 because high inflation countries would be able to impose higher interest rates. The results obtained with fast rotations are less dependent on the perimeter of the Eurozone, and closer to the Executive Board's desired rate, than those obtained with a constituency system.

Keywords: ECB Governing Council, EMU enlargement, monetary policy, voting.

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1. Introduction

By joining the European Union in May 2004, the ten new Member states (NMS hereafter) also committed themselves to join the Eurozone when appropriate. The opting-out clause, that allows the United Kingdom, Denmark and Sweden to remain outside the monetary union, does not apply to them. In June 2004, three NMS (Estonia, Lithuania and Slovenia) joined ERM2; in April 2005, three others (Latvia, Malta and Cyprus) joined; in November 2005, Slovakia joined. These countries are likely to be part of the Eurozone by 2007-2008. Poland, Hungary and the Czech Republic, which are not yet part of ERM2, generally mention 2009-2010 as the target date for entering the Eurozone.

The question of monetary policy-making in an enlarged Eurozone was tackled by the European Council of March 21, 2003, which modified Article 10.2 of the statutes of the Eurosystem.[1] A system of rotation was adopted in order to limit to 21 the number of votes at the Governing Council (GC hereafter) which is the decision body of the Eurosystem concerning monetary policy. Although the ECB has been claiming that the decisions of the GC are made by consensus without use of any formal voting, reaching a consensus will become more difficult with enlargement, and the use of formal voting may become necessary (Berger and de Haan, 2002). With six members of the Executive Board still being always entitled to vote, this would leave 15 votes to be distributed among the governors of national central banks (NCBs), hence among 25 national governors when the Eurozone reaches the frontiers of the present European Union. The European Council adopted a system of rotation of the votes within two or three groups of countries, depending on the total number of Member States in the Eurozone.

This limitation in the number of votes when a decision is under way aims at (i) allowing manageability of the decision-making despite the growing number of Member states, and (ii) ensuring that the decision meets the interest of the Eurozone as a whole despite the growing proportion of "small" member states, which necessarily have a small effect on Eurozone aggregate inflation. The present paper tries to assess the advantages of the new rules as far as the latter point is concerned. It also studies the implications of the new decision rules for individual member states.

The literature on Eurozone decision-making after EMU enlargement is rooted in researches on the balance of power between the "centre" (the Executive Board of the Eurosystem, the Board of Governors of the US FOMC) and the "periphery" (the national governors of the Eurosystem, the rotating presidents of US Federal Reserve district banks). For instance, von Hagen and Süppel (1994) show that decentralization of monetary policy-making leads to inefficient monetary stabilisation; in addition, long-run inflation is shown to be higher if decentralization of monetary policy coincides with a weak political centre, which is likely to be the case in a multi-country monetary union. Consistently, several papers[2] have noted that the US FOMC is more centralized than the European GC. The high weight of national governors in the GC is not harmful if national governors embrace a euro-wide view, as claimed by the ECB. However, there is some (debated) evidence that US regional governors are at least partly influenced by regional considerations (Havrylesky and Gildea, 1995). Although similar behaviour cannot be examined for the European

[1] See *Official Journal of the European Union*, 1.4.2003, (2003/223/EC).
[2] Dornbusch et al. (1998), Wynne (1999), Heinsohn and Steiger (2002, 2003), for instance.

GC (since the minutes of the meetings are not published), the heterogeneity and multi-national features of the Eurozone are likely to increase the risk that national governors will be influenced by national considerations. Furthermore, the risk is likely to increase with EMU enlargement.

Decentralization of decision-making is benign in a homogenous monetary union, since regional and federal interests are likely to coincide, which, again, is less the case in the Eurozone than in the United States. Askoy, de Grauwe, and Dewachter (2002) consider a model where asymmetrical shocks on production and inflation, as well as asymmetric economic structures, are potential sources of tension on the single monetary policy. Various voting rules are then compared in terms of their capacity to bring the interest rate to its desired level for the Eurozone as a whole. They conclude that the decision-making rule with a Eurozone 12, in which each governor plays a part in the decision process, is efficient. Indeed, the decision almost always follows the desired rate of the Executive Board (which is assumed to have a euro-wide view, whereas national governors are assumed to follow national views). This results from the median position of the Executive Board regarding desired interest rates. Moreover, the correlations between the interest rates wished and decided are more important for large countries, which is consistent with their weight in the aggregate of the zone.

With more national governors allowed to vote on monetary decisions, however, the weight of the Executive Board and of large, core countries is reduced. More specifically, enlarging the Eurozone to NMS carries the risk that a group of small, high-inflation countries form a winning coalition against the interests of the countries forming the bulk of Eurozone's GDP (Baldwin et al., 2000). Here we explore this possibility by simulating various voting procedures with various Eurozone perimeters.

Berger (2002) has already studied the implications of Eurozone enlargement for the balance of power in the GC. He considers the decisions of the GC to be the result of a bargaining process between (i) old EMU members and new ones, and (ii) the Executive Board and the group of all national governors. To the extent that new members have a higher inflation bias (stemming from higher output target), he concludes that centralization is preferable to close the gap between economic and political weights, and that a weighted voting scheme or a rotation system performs better than the *status quo*. Still, the whole analysis focuses on the discrepancy between political weight and economic weight, with no regard for the outcome of monetary policy. Specifically, Berger does not account for the interest rate decided by the GC being the same as the Executive Board's choice despite low power of the Executive Board. Depending on the characteristics of newcomers, the Executive Board and core EMU countries could *de facto* obtain the monetary policy they wish, despite the drop in their voting weight.

In turn, Fahrholz and Mohl (2004) study EMU enlargement through a voting-power analysis where the power of a player depends on his ability to move a losing coalition into a winning coalition. They find that the power of the Executive Board shrinks from 59% in the Euro12 to 17% in the Euro25, applying the rotation system proposed by the ECB. Fahrholz and Mohl conclude that "fears of considerable loss of current EMU-members' influence on European monetary policy are well-founded" (p. 19). Again, the analysis does not account for the proximity of the players in terms of monetary policy needs: in Fahrholz and Mohl, Slovakia has the same probability of forming a coalition with Hungary as with Germany. In reality, high inflation countries will more likely form a coalition within themselves than with low inflation countries, as

mentioned by Baldwin et al. (2000). This could sustain the power of core EMU countries and of the Executive Board, provided they have enough votes to counterbalance high inflation countries. In brief, the nature of newcomers (in terms of desired interest rates) is as important as their voting rights when analysing the impact of EMU enlargement.

Here we simulate various decision rules within four Eurozone perimeters: Euro12, Euro18 (Euro12 plus Baltic countries, Slovenia, Cyprus and Malta), Euro22 (Euro18 plus Hungary, Czech Republic, Poland and Slovakia) and Euro25 (Euro22 plus Denmark, Sweden and the UK). We first calculate desired interest rates on the basis of Fisher, truncated Taylor and Taylor rules successively, and on the basis of a real and price convergence of all Euro25 countries towards the Euro12 aggregate within 30 years. Consistent with the literature, national governors are assumed to adopt nationalist views, whereas the Executive Board embraces a euro-wide view. The decided rate is then calculated as the median of all voting members of the GC. We compare the rotation rule with the "old" rule (where all national governors are entitled to vote) and with a system of constituencies (i.e. a two-step vote).

The new decision system is described in Section 2. Section 3 presents the methodology used to simulate the decisions of the GC. The various decision rules are compared in Section 4. Section 5 details the impact of Eurozone enlargement for Euro12 countries. Conclusions are presented in Section 6.

2. The new decision scheme

With 12 members in the Eurozone and 6 members in the Executive board (EB), the Governing Council (GC) totals 18 members. The new decision system will apply when this number exceeds 21. The EB staying unchanged, this means that the new system will apply when there are more than 15 members in the Eurozone. From 16 to 21 governors, the votes for national governors will be fixed at 15, and these votes will rotate within two groups of countries: the group of the five largest countries, and the group of N-5 smaller countries, where N denotes the number of Euro members. Over 21 members, the number of votes for national governors will stay fixed at 15 but the rotation will then be organised within three groups of countries: the group of the five largest countries, the group of average-size countries totalling half the total number of governors (hence N/2), and the group of smaller countries (N-5-N/2 smallest countries).[3]

The size of each country will be assessed on the basis of a mix between GDP (5/6 of total weight), and total assets of monetary and financial institutions (1/6 of total weight). The classification of the countries in groups will be revised every five years. Based on 2002 data, the distribution of member states in the two or three groups is detailed in Table 1 for 18, 22 and 25 Member states.

The voting rights of each group of countries will be distributed in the following way. From 16 to 21 countries in the Eurozone, the first group (five largest countries) will have 4 votes and the second one (smaller countries) will have 11 votes. Votes will rotate within each group, provided that the frequency of votes within the second group does not exceed that of the first group. In practice, this means that the system of rotation may be postponed (upon a two-thirds majority of

[3] N/2 will be rounded up when necessary.

the GC, irrespective of whether members hold a voting right or not) until the number of countries in the Eurozone reaches 19. From 22 members in the Eurozone, the voting rights will rotate within the first group (4 votes for 5 members), within the second one (8 votes rights), and within the third one (3 votes).

In any case, the EB will retain six voting rights. In case of a division of the votes, the President, also a member of the EB, would have the decision vote. In practice, consensus will still be sought, and the decisions will be made unanimously when possible. Hence the system will apply mainly in the case of large divergences of views within the GC.

Table 1: distribution of member states in the three pools of voting rights, based on 2002 data

	Euro-18*		Euro-22	Euro-25
	Euro12 + Baltic countries + Cyprus + Malta + Slovenia		Euro12 + 10 NMS (UK, Sweden, and Denmark out)	EU25
Group 1	Germany	**Group 1**	Germany	Germany
4 voting rights	France	4 voting rights	France	United Kingdom
	Italy		Italy	France
	Spain		Spain	Italy
	Netherlands		Netherlands	Spain
Group 2	Belgium	**Group 2**	Belgium	Netherlands
11 voting rights	Austria	8 voting rights	Austria	Belgium
	Ireland		Ireland	Sweden
	Portugal		Poland	Austria
	Greece		Portugal	Denmark
	Luxembourg		Greece	Ireland
	Finland		Luxembourg	Poland
	Slovenia		Finland	Portugal
	Lithuania		Czech Republic	Greece
	Cyprus		Hungary	Luxembourg
	Latvia		Slovakia	Finland
	Estonia			Czech Republic
	Malta			Hungary
		Group 3		Slovakia
		3 voting rights	Slovenia	Slovenia
			Lithuania	Lithuania
			Cyprus	Cyprus
			Latvia	Latvia
			Estonia	Estonia
			Malta	Malta

* In the Euro18 case, voting rights rationing will likely not apply in practice, see the text.

Source: ECB, own calculations.

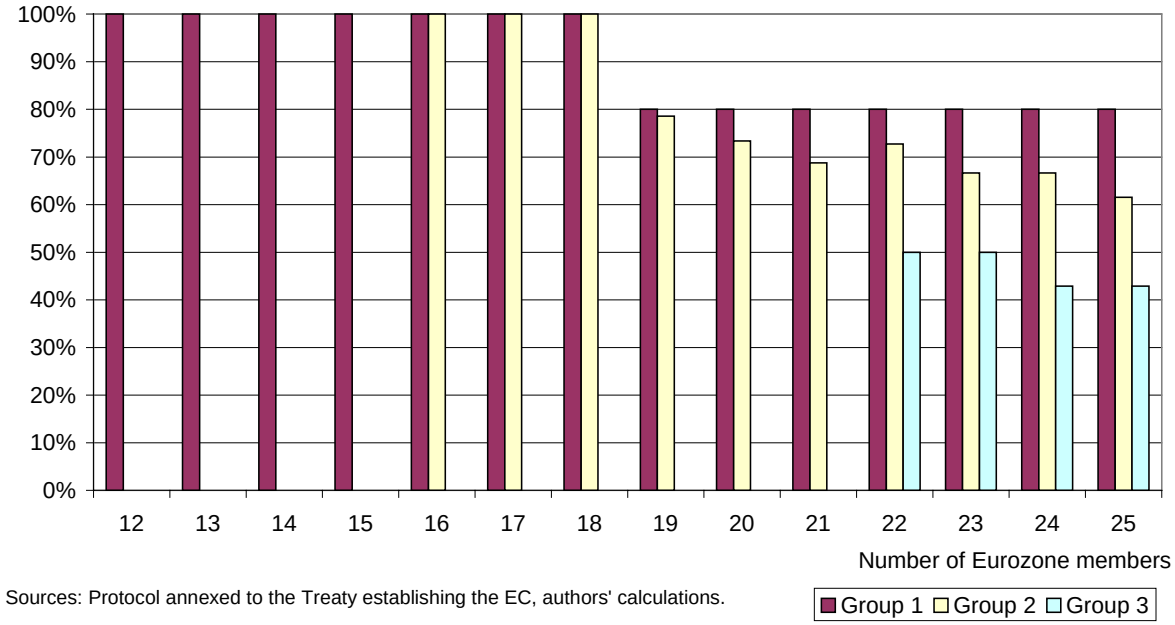
It should be noted that all national governors will still attend the meetings of the GC, but some of them will no longer be entitled to vote. The rotation system aims at allowing large economies to preserve their weight despite the enlargement which will mainly concern “small” countries, and

despite the principle of one person-one vote. The frequency of vote for each NCB is obtained by dividing the number of voting rights of the corresponding group by the number of governors (see Graph 1). The frequency is higher for large countries (Group 1), for which it remains constant around 80% when the number of members rises from 19 to 25. From 16 to 18 Member States, the theoretical frequency of the votes in Group 2 is 11/11, 11/12 and 11/13 respectively for 16, 17 and 18 Member States, whereas it stable at 4/5 in Group 1. Hence the frequency is lower for Group 1 than for Group 2, and the rotation system will likely be postponed until the Eurozone reaches 19 member states. This is the assumption made in Graph 1.

Finally, the sequences of rotation are left to the latitude of the ECB.

Graph 1

Frequency of the votes in each group of NCBs



Sources: Protocol annexed to the Treaty establishing the EC, authors' calculations.

Note: from 16 to 18 Member States, the “old” system is assumed to apply.

This new decision scheme, which was initially suggested by the ECB, was first rejected by the European Parliament on March 13, 2002, before being adopted by the European Council on March 21, 2003. At the Parliament, the Friedrich report (2003) considered that the new voting system would be less transparent and less accountable, and not more efficient than the old one, since all governors would still take part in the debates, even without a voting right. The report recommended that operational decisions be delegated to an enlarged EB while keeping the one-member-one-vote principle for institutional/strategic decisions within the GC, conditional on a demographic threshold (double-majority requirement).

Three other solutions for a reform of the decision scheme had been contemplated:[4] (i) weighted votes, (ii) centralization, or (iii) a system of constituencies, such as that used at the International Monetary Fund.

(i) *Weighting* the votes of national governors would have required a modification of Article 10.2 of the Maastricht treaty (one-member-one-vote principle), which appeared politically complicated.

(ii) A system of *centralization* would have attributed to the EB more power or even all power concerning monetary policy. Again, this would have required a revision of the Maastricht treaty. In addition, such a solution would have made the already-existing problem of accountability even more acute. One suggestion (Baldwin et al. 2000) was to centralize the conduct of monetary policy in the hands of the EB but leave the Ecofin council with the task of defining the inflation target. Another suggestion, made by Gros (2003), was that the plenary GC meet only every quarter for strategic decisions, leaving the EB the responsibility for week-to-week monetary tuning. This proposal was close to the European Parliament (2003) one (see above).

(iii) Finally, a system of *constituencies* similar to that of the International Monetary Fund was also considered. Voting rights would have been distributed across several groups of countries, and only one representative of each group would have been entitled to vote (with a specific weight) at the GC, after consulting the members of his group. This system appeared relatively cumbersome since it would have implied pre-negotiations within each group (see, for instance, Eichengreen and Ghironi, 2001; Berger, 2002).

The solution which was adopted is thus intermediate, and seems to account for the multiple constraints. Its resilience remains to be proven once confronted with the risks related to enlargement.

3. Methodology

Here we assume that, when allowed to vote, each NCB adopts a nationalist view, whereas the EB always takes an euro-wide view. This may appear an extreme assumption, since so far the GC has always been claiming that its members were all adopting a euro-wide view of monetary policy. However, as argued in the introduction, EMU enlargement will likely raise nationalist concerns within the GC. Conversely, there is no doubt that enlarging the GC produces little change in decision-making if each NCB member adopts a euro-wide view, except for possible non-nationalistic divergences of views such as different views on the functioning of the Eurozone economy as a whole.

[4] See Eichengreen and Ghironi (2001), Berger (2002).

3.1. Desired interest rates

To simulate the votes, a model of "desired" interest rates is needed. Here we use a basic Taylor rule:[5]

$$i_k = r_k + \pi_k + 0.5(\pi_k - 2\%) + 0.5\, og_k \qquad \text{k = 1 to 25} \qquad (1)$$

where i_k denotes the desired short term interest rate of country k, r_k its "neutral" real interest rate, π_k its inflation rate, og_k its output gap (defined as the discrepancy between GDP and potential GDP). The desired rate of the EB is defined the same way but with euro-wide aggregates instead of national ones. A 2% inflation target is assumed for every member of the GC.

We must account for desired interest rates being dependent on real and nominal convergence, the latter being a pre-condition for euro membership. Here we assume that both GDP per capita and price levels converge in 30 years; hence, this convergence will still be under way when the Eurozone is enlarged. Following the golden rule, the "neutral" level of the real interest rate is equal to the growth rate, which itself results from the catching-up process. In a similar way, average inflation for each country can be calculated by assuming that remaining price discrepancies across euro members progressively disappear in 30 years. Before joining ERM2, nominal exchange-rate appreciation can bear part of the convergence; this is no longer the case in ERM2, and of course no longer the case either in EMU.

Here we proceed in three steps. Firstly, we apply only the first half of the Taylor rule which reduces to a Fisher equation:

$$i_k = r_k + \pi_k \qquad \text{(Fisher)} \qquad (2)$$

Secondly, we assume that countries with higher inflation will call for higher real interest rates, as represented by a truncated Taylor rule:

$$i_k = r_k + \pi_k + 0.5(\pi_k - 2\%) \qquad \text{(truncated Taylor)} \qquad (3)$$

In a final step, we introduce output-gap asymmetries into the analysis, as in the original Taylor rule:

$$i_k = r_k + \pi_k + 0.5(\pi_k - 2\%) + 0.5\, og_k \qquad \text{(Taylor)} \qquad (4)$$

In each case, we compare four decision rules:

1. **Centralization**: the GC follows the EB view, i.e. everyone adopts a euro-wide view (no vote is required in this case);

[5] Taylor (1993). Of course, the Taylor rule may not correctly describe desired interest rates of EMU members. However national desired rates in EMU are unobservable, and observed interest rates before EMU are useless due to the structural change when joining the monetary union. Using the same rule for all countries and for the EB allows us to catch the pure impact of enlargement, as opposed to a change in preferences.

2. **Old rule**: all NCBs have a voting right and vote according to their nationalist interest;
3. **New rule**: only 15 NCBs have a voting right and vote according to their nationalist interest;
4. **Constituencies**: the desired rate of each group of NCBs is assumed to be the median of the desired rates within the group; then, the decided rate of the GC is the weighted median of the three (or two) groups of NCBs and of the EB. Although this last decision rule was discarded in 2003, we believe a slow rotation of the votes (say, once a year) could show up close to it in practice.

We now turn to the assumptions used to calculate desired interest rates on the basis of equations (2), (3) and (4).

3.2. Neutral real interest rates

Consistent with the golden rule, the neutral real interest rate is assumed to be equal to the long-run real GDP growth rate. A linear convergence of GDP per capita to the Euro12 level in 30 years is used to recover average growth rates of GDP per capita. Then, United Nations long-run forecasts concerning labour force growth are introduced. Hence the long-run growth rate of GDP in each country, g_k, is the following:

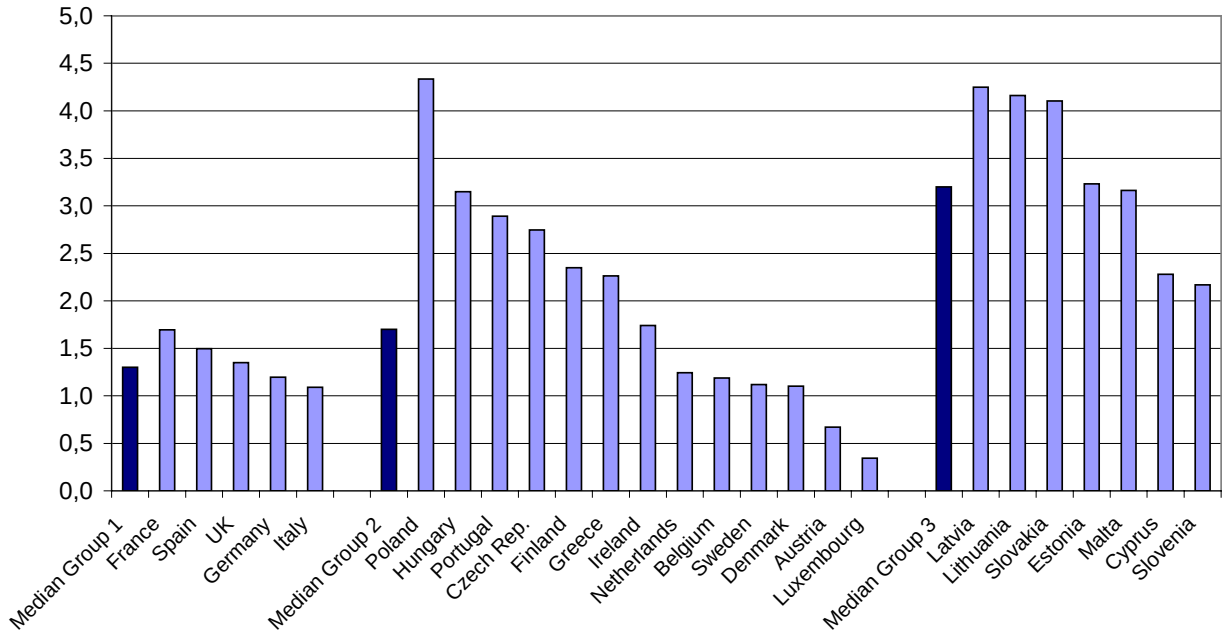
$$g_k = \left(\left(\frac{Y_{euro,2004}}{Y_{k,2004}} \right)^{\frac{1}{30}} \times 1.02 - 1 \right) + n_k \qquad (5)$$

where n_k is the average yearly growth of the labour force in country k between 2004 and 2034, the growth rate of GDP per capita in the Euro12 is assumed to be 2% per year, $Y_{euro,2004}$ denotes the level of GDP per capita of the Eurozone in 2004, $Y_{k,2004}$ the level of GDP per capita of country k the same year, both in purchasing power parity.[6] The resulting growth rates are displayed in Graph 2. Growth rates are generally higher in Group 2 than in Group 1, and much higher in Group 3 than in Group 2. However Group 2 is more heterogeneous than the two other groups, with a number of countries displaying very low growth rates (less than 1.5% a year).

[6] The use of PPP levels is consistent with price convergence being accounted for as a separate effect. ECB data are used (see Appendix A).

Graph 2

Growth rates of EU Member states, avg 2004-2034



Sources: ECB and authors' calculations.

3.3. Inflation rates

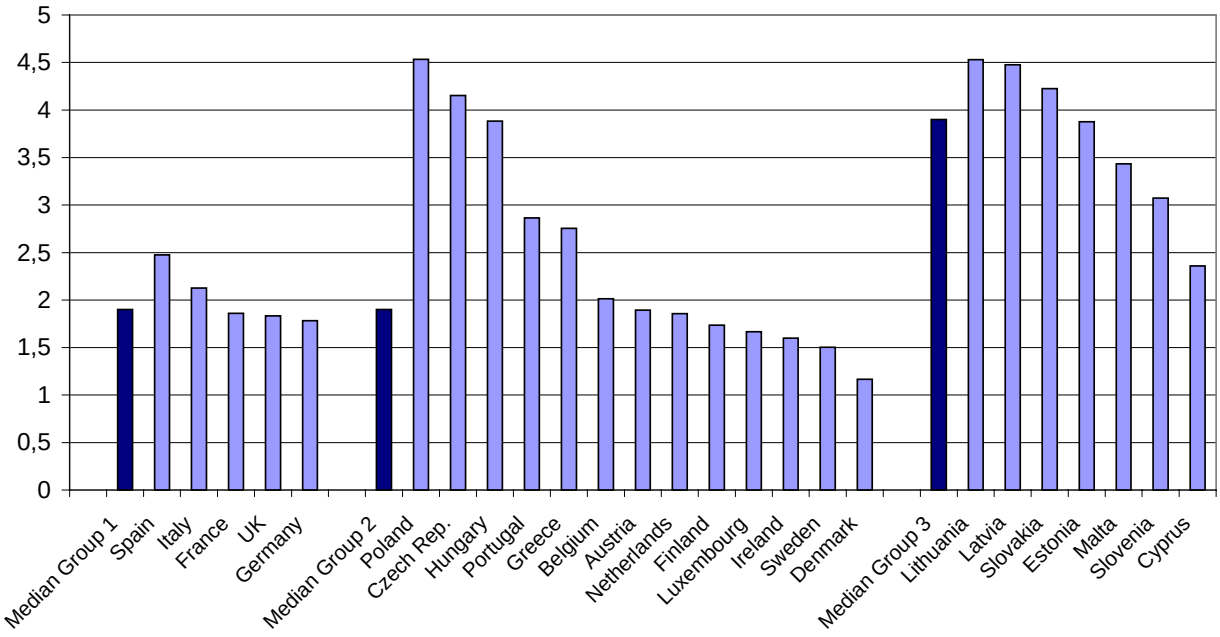
Concerning inflation, we assume a complete, linear convergence of price levels towards the Euro12 level in 30 years, Euro12 aggregate inflation being 2% on average. Hence the average inflation rate of country *k* over 2004-2034 is given by:

$$\pi_k = \left(\left(\frac{P_{Euro,2004}}{P_{k,2004}} \right)^{\frac{1}{30}} \times 1.02 - 1 \right) \qquad (6)$$

where $P_{\text{euro},2004}$ denotes the price level of the Euro in 2004 and $P_{k,2004}$ the price level of country *k* in 2004 (calculated on the basis of ECB data on GDP per capita in purchasing power parity and in current euros, see Appendix A). The resulting inflation rates are reported in Graph 3. Like for growth rates, average inflation is higher for Group 3 than for Group 2. However Median inflation rates are the same in Groups 2 and 1, although there is much heterogeneity within Group 2, with three large NMSs displaying high inflation rates (over 3.5%).

Graph 3

Inflation rates of EU Member states, avg 2004-2034



Sources: ECB and authors' calculations.

3.4. Output gaps

By construction, the average output gap of each member state is zero. Hence, output gaps cannot impact on NCBs' desired interest rates on average. However, to the extent that business cycles are asymmetric within the Eurozone, at each point of time differences in output gaps translate into differences in desired interest rates by NCBs. Here we successively consider a positive and a negative shock of one standard deviation on the EU25 aggregate output gap. On the basis of the variance-covariance matrix of output gaps between each Member state and the EU25 aggregate, we recover the "typical" output gap of each Member state when the EU25 is hit by a positive or negative shock. For instance, if the correlation between the Austrian output gap and the EU25 output gap is 0.70, it will be assumed that, when the output gap of the EU25 is $+\sigma_{EU25}$, then the Austrian output gap is $0.70\sigma_{Austria}$ where σ_{EU25} and $\sigma_{Austria}$ denote the standard deviations of the EU25 and Austrian output gaps, respectively. The general formula is the following, where $CORR_{EU25,k}$ denotes the correlation between the cyclical component of industrial production of each country and that of the EU25 aggregate, calculated over 1995-2004[7], and α is a dummy variable which is equal to +1 in the case of a positive shock, -1 in the case of a negative one:[8]

[7] Deseasonalised industrial production is used together with a Hodrick Prescott filter with a 500,000 smoothing parameter.

[8] Differentiating positive and negative shocks is useful since, depending on the direction of the shocks, NCB desired interest rates will either converge or diverge.

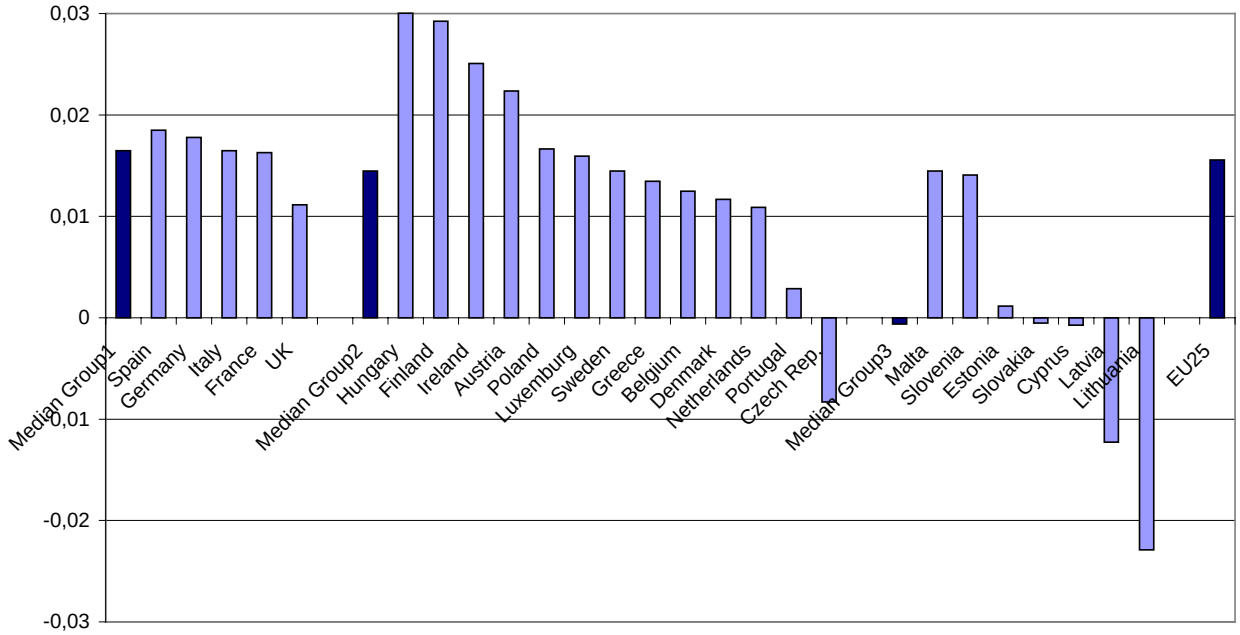
$$og_k = \alpha \sigma_k CORR_{EU\,25,k} \qquad (7)$$

The resulting output gaps are displayed in Graph 4 in the case of a positive shock on the EU25 aggregate ($\alpha = +1$). The output gap of Group 1 countries (including the UK) is close to that of the EU25 aggregate, which is hardly surprising given the weight of these countries in the aggregate. Most Group 2 countries (with the exception of Portugal and the Czech Republic) also display positive output gaps. However, Hungary, Finland and Ireland will call for relatively higher rates because their output gaps are more volatile. Finally, the situation is contrasted in Group 3 where only in Malta and Slovenia is the shock asymmetric compared to the EU25 aggregate.

The inclusion of output gaps in the analysis is questionable because it is based on the variance-covariance matrix of national output gaps over the past. If national business cycles are to converge over time due to EU membership and later to Euro membership, then our methodology tends to overplay the heterogeneity of desired interest rates stemming from business-cycle asymmetry. However, there is no simple way of forecasting business-cycle convergence over the 2004-2034 period. This is the reason for using both a Taylor rule (based on past business cycles) and a truncated Taylor rule (which excludes business cycles from desired rates) in the analysis.

Graph 4

Output gaps, positive shock on EU25



Sources: Eurostat, authors' calculations.

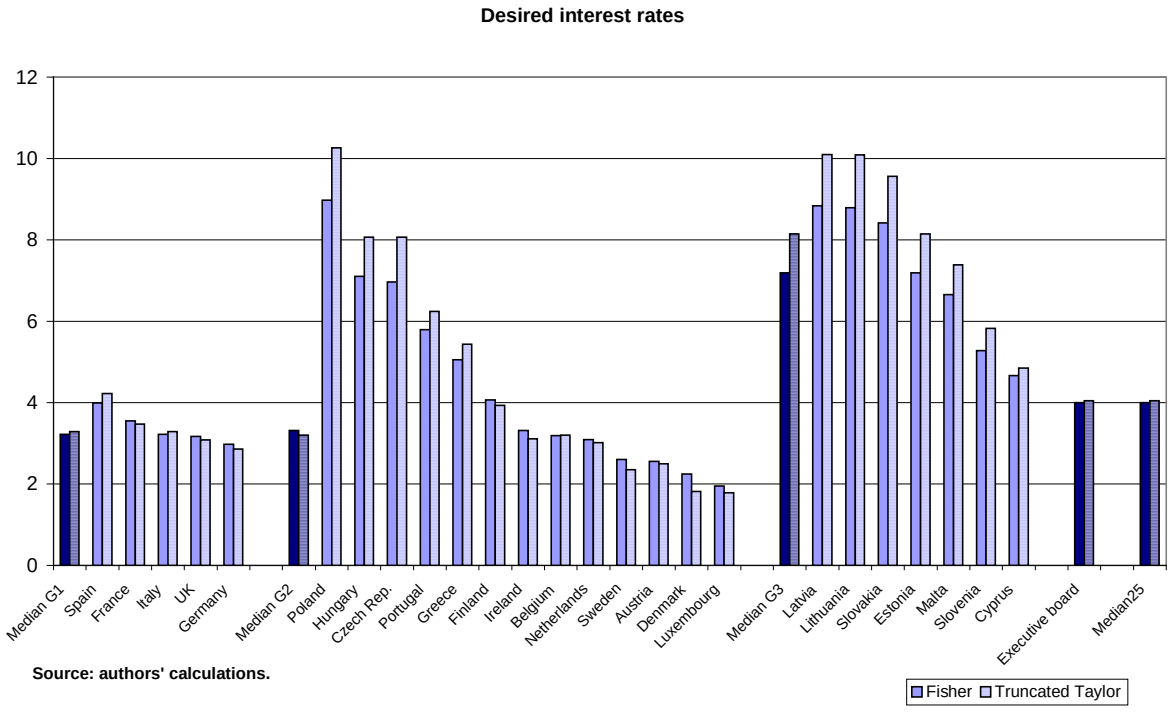
3.5. Desired interest rates again

Desired interest rates can now be recovered following the three models listed in Section 3.1: Fisher, truncated Taylor, and Taylor. The desired rates for each country is displayed in Graphs 5 and 6, together with the median of each group. Not surprisingly, desired rates are higher in Group 3 than in Group 1. Interestingly, though, the median of Group 2 is very close to that of Group 1. This is due to the large heterogeneity in Group 2: the number of countries calling for high interest rates is not large enough to bring the median of this group higher than that of Group 1.

Accounting for output gap asymmetries does not change this broad picture. In the case of a negative shock on the EU25, Latvia, Lithuania and the Czech Republic ask for higher rates (because they face a positive shock) whereas a number of countries ask for no change in the interest rate (because they do not face any shock). Contrasting with Groups 1 and 2, the median of Group 3 does not decline, but Group 3 alone cannot have a strong impact on the final decision of the GC, as will be shown in the following.

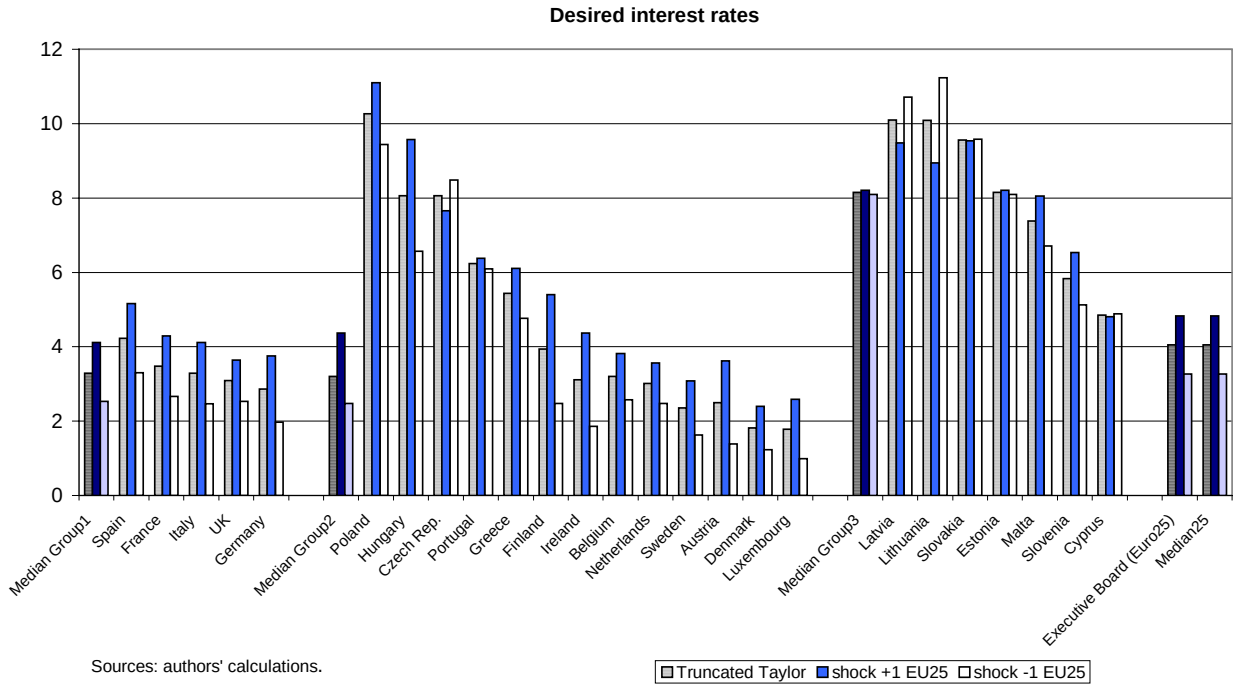
The desired rate of the EB (which here embraces a Euro25-wide view) is also reproduced in the graphs. It lies in-between the choices of Groups 1-2 and of Group 3. Finally, the median of the GC with 31 members (6 members of the EB plus 25 national governors) is displayed ("Median25"). The latter median represents the choice of the whole GC if all members have a vote, assuming there are no strategic votes. Strikingly, the choice of the GC if all members have a voting right is the choice of the EB. Using a Fisher rule, a truncated Taylor or a full Taylor rule does not change the picture.

Graph 5: desired interest rates, Fisher /truncated Taylor



Source: authors' calculations.

Graph 6: desired interest rates: Truncated Taylor/Taylor, shock on EU25



Sources: authors' calculations.

4. Comparing decision rules

Here we compare the outcome of various decision rules at the Governing Council. We start with benchmark simulations which cover the centralization case (where the interest rate is decided by the EB or by a euro-wide consensus) and the old rule (where all NCBs are allowed to vote). For the sake of comparison, we add two hypothetical rules: a "Euro12" rule where only "old" Eurozone members are allowed to take part in the vote (along with the EB), and a "weighted average" rule where the decided rate is a weighted average of all desired rates, the weights being in line with voting rights.[9] The latter case could correspond to a decision made by consensus after discussion where the influence of each national governor would be in line with the frequency of his voting right.

Then, the "new" rule is simulated. Since the sequence of rotations has not yet been decided, we simulate two polar scenarios. In the first one ("Median15 high"), voting NCBs happen to be those asking for the highest interest rates in each group; in the second one ("Median15 low") they happen to be those asking for the lowest rates in each group. Finally, we argue that a system of slow rotations (say once a year) could end up close to a constituency system where there would be preliminary votes within each group. We explore this last possibility.

In each case, we start with a Euro25 and then show what happens in the case of a Euro18 (Euro12

[9] Note that our results cannot directly be compared to Berger (2002) where the weights used are the shares of member countries in GDP. For instance, the weights of NMS is higher in our analysis than in Berger's.

+ Baltic countries + Slovenia + Cyprus + Malta) and in the case of a Euro22 (Euro12 + NMS10).

4.1 Benchmark simulations

Here we compare four decision rules: (i) centralization ("Executive Board"), (ii) old rule ("Median25"), (iii) Euro12-centered rule ("Median12"), (iv) weighted average. In all cases, the EB votes using EU25-wide aggregates (or EU22, or EU18, in the Euro22 and Euro18 scenarios, respectively) . In the fourth rule, the decided rate is a weighted average of desired rates, the weights being based on voting frequencies within each group, i.e. 4/5 for countries in Group 1, 8/13 for those in Group 2 and 3/7 for those in Group 3 countries, each member of the EB being weighted 1.[10] None of these four rules corresponds to the new voting system. They are used as benchmarks in the following.

Euro25

The results for a Euro25 are reported in Graphs 7 and 8. They show that enabling new national governors to take part in the vote (Median25 rule) does not change the result of the vote compared to leaving the choice to the EB (centralization rule). This is because half of the countries have desired rates close or inferior to the desired rate of the EB: in the case of a Fisher rule, for instance, the five members of Group 1 plus seven members of Group 2 wish interest rates that are lower than the EB desired rate. This makes 12 national governors voting for rates below the EB's preferred rate, the remainder (13 national governors) voting for rates above the EB's choice. Hence the Board represents the median for a GC with 25 member states.

This situation contrasts with the result of a weighted vote. In this case, the interest rate shows up much higher than the EB's preference. This is because some small countries ask for very high interest rates (see Graphs 5 and 6). Although their weight is limited, their impact on the weighted average is sizeable.

Finally, when only Euro12 members are entitled to vote (along with the EB), the decided rate is slightly lower than the EB's preference, especially when inflation differentials are accounted for (truncated Taylor, Taylor). The difference between Median25 (or EB) and Euro12 rules is negligible in the Fisher case; it amounts to 0.06 percentage point in the truncated Taylor case, and rises to 0.3 percentage point in the case of a Taylor rule with a negative shock on the EU25.

In the case of a positive shock on the Euro25 output gap, the desired rate of the EB increases less than the Median12 one because the Euro25 output gap is less reactive than the Euro12 one (see Graph 4); hence enlarged Eurozone decision making leads the desired rate of Euro12 countries, which is lower than that of other countries, to slightly converge towards the EB's choice, which is the same as the decided rate of the Euro25. Conversely, in the case of a negative shock on the Euro25 output gap, a majority of Euro12 countries want a larger rate cut than the EB's choice because their output gap is more reactive than that of the aggregate Euro25. Since their desired rate already lies below the EB's choice, the gap between Euro12 preferred rate and the decided rate rises.[11]

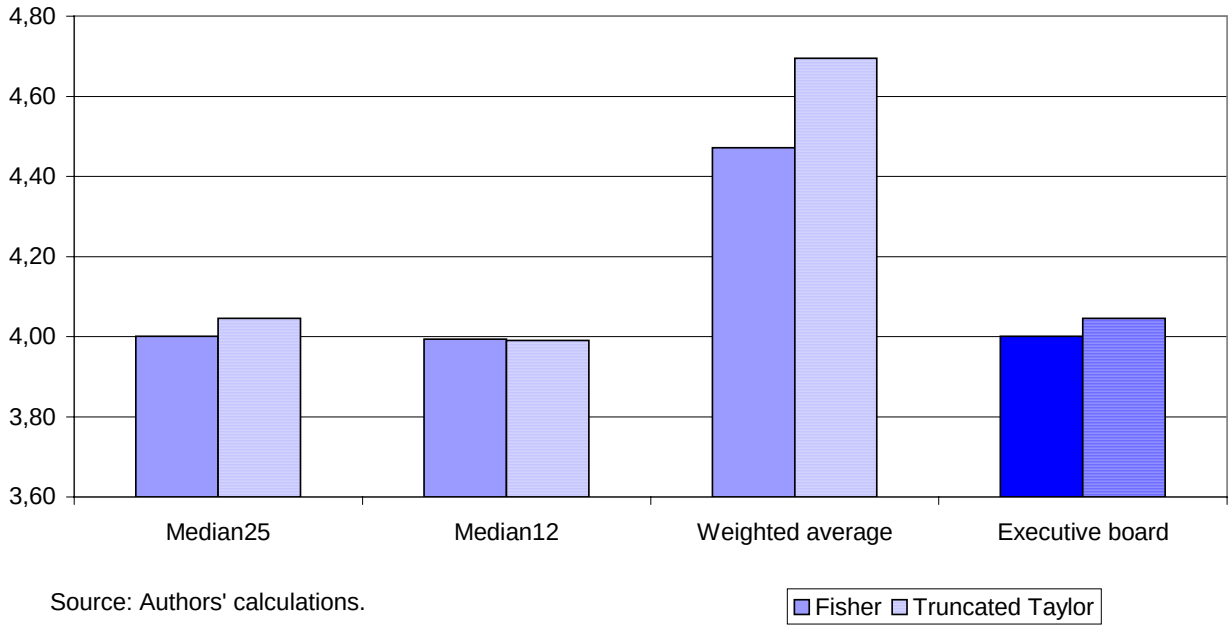
[10] The weights are normalised so as to sum to unity.

[11] In the case of a shock on NMS' output gaps (not shown here), the reverse picture applies. Specifically, the gap

This varying gap between the desired rate of the EB and that of the Euro12 (Euro12 countries + EB) is one building block of the cost suffered by Euro12 countries when the Eurozone is enlarged to 25 countries. The second building block is the rise in the desired rate of the EB which amounts to 0.3-0.4 percentage point when moving from Euro12 to Euro25. Hence in the worst case (negative shock on the Euro25), Euro12 countries would suffer from a rise in the gap between their desired rate and the decided rate by 0.7 (0.3 + 0. 4) percentage point.

Graph 7: benchmark simulations, EU25, Fisher/truncated Taylor

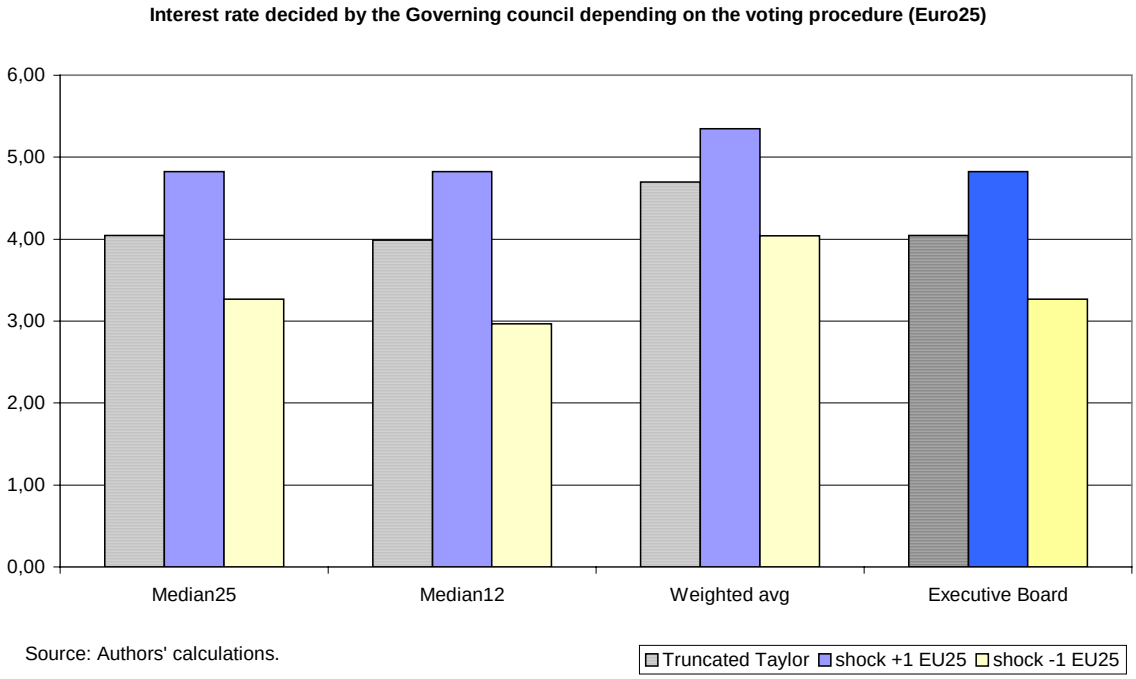
Interest rate decided by the Governing council depending on the voting procedure (Euro25)



Source: Authors' calculations.

between the decided rate of the Euro25 and the desired rate of the Euro12 rises in the case of a positive shock on NMS and falls in the case of a negative shock on NMS. In the latter case, for instance, the fall in the Euro12 desired rate is smaller than the fall in the EB's desired rate. See Bénassy-Quéré and Turkisch (2005).

Graph 8: benchmark simulations, EU25, truncated Taylor/Taylor, shock on EU25



Source: Authors' calculations.

Euro22 and Euro18

These conclusions remain qualitatively unchanged when a Euro22 or Euro18 is contemplated. As shown in Appendices B and C, the result of a vote where all 22 or all 18 NCBs have a vote is exactly the same as the EB's choice (accounting for the fact that the desired rate of the EB is now calculated on a Euro22 or Euro18 aggregate rather than on a Euro25 aggregate).

Again, the Euro12 suffers from enlargement, since the Median22 (i.e. the decided rate of the Euro22 within the "old" decision rule) and the Median18 (i.e. the decided rate of the Euro18 within the "old" rule) are always higher than the Median12. Interestingly, the gap between the Euro22 decided rate and the desired rate of Euro12 countries (the cost of enlargement for Euro12 countries) is larger than in the Euro25 case. It reaches 1 percentage point in the case of a negative shock on the Euro25. Indeed, the cost of enlargement appears larger for Euro12 countries when the Eurozone is enlarged to 22 countries compared to either 25 or 18. This is because the Euro22 includes four high-growth, high-inflation countries (Poland, Hungary, Czech Rep., Slovakia) which happen to have more impact on decided rates within a Euro22 than within a Euro25, where the three additional countries (UK, Sweden, Denmark) have low desired rates and a large weight (UK). Consistently, a Euro25 appears less costly for Euro12 countries than a Euro18 scenario, thanks to the inclusion of Sweden, Denmark and, especially, the UK which have a sizeable impact on the desired rate of EB.

4.2. Rotating votes

We now consider rotating votes. In order to gauge the risk of GC's decisions being twisted towards higher or lower interest rates, we consider two polar scenarios. In the first one (Median15 high), the voting rights are allocated by chance to the members of each group displaying the highest desired interest rates; in the second one (Median15 low), they are allocated to the members of each group displaying the lowest desired interest rates. The selection of countries is detailed in Table 2, for a Euro25 and a Euro22. In the case of a Euro18, following a provision of the protocol annexed to the Treaty, the rotation system will likely be postponed because Group 1 would suffer from lower frequency than Group 2 (see Section 2). Hence, the old rule still applies and all 18 national governors have a vote. We nevertheless explore two scenarios where only 15 national governors have a vote, but there are no rotations in Group 1 (hence all five members have a vote), whereas Group 2 is attributed only 10 votes (for 13 NCBs).[12] Finally, we also consider a system of constituencies where the decided rate is the weighted median of four rates: the median of each NCBs group, and the desired rate of the EB.

Table 2: two polar scenarios (Fisher or truncated Taylor rule)*

	Euro25			**Euro22**		
	Group 1 (4 countries)	**Group 2 (8 countries)**	**Group 3 (3 countries)**	**Group 1 (4 countries)**	**Group 2 (8 countries)**	**Group 3 (3 countries)**
High rates	Spain France Italy UK	Poland Hungary Czech Rep. Portugal Greece Finland Ireland Belgium	Latvia Lithuania Slovakia	Spain France Italy Netherlands	Poland Slovakia Hungary Czech Rep. Portugal Greece Finland Ireland**	Latvia Lithuania Estonia
Low rates	France Italy UK Germany	Finland Ireland Belgium Netherlands Sweden Austria Denmark Luxembourg	Malta Slovenia Cyprus	France Italy Netherlands Germany	Czech Rep. Portugal Greece Finland Ireland Belgium Austria Luxembourg	Malta Slovenia Cyprus

* the groupings do not change much with a Taylor rule, see Bénassy-Quéré and Turkisch (2005).

** Fisher case. For a truncated Taylor rule, Ireland is replaced by Belgium.

Source: Graph 5.

Euro25

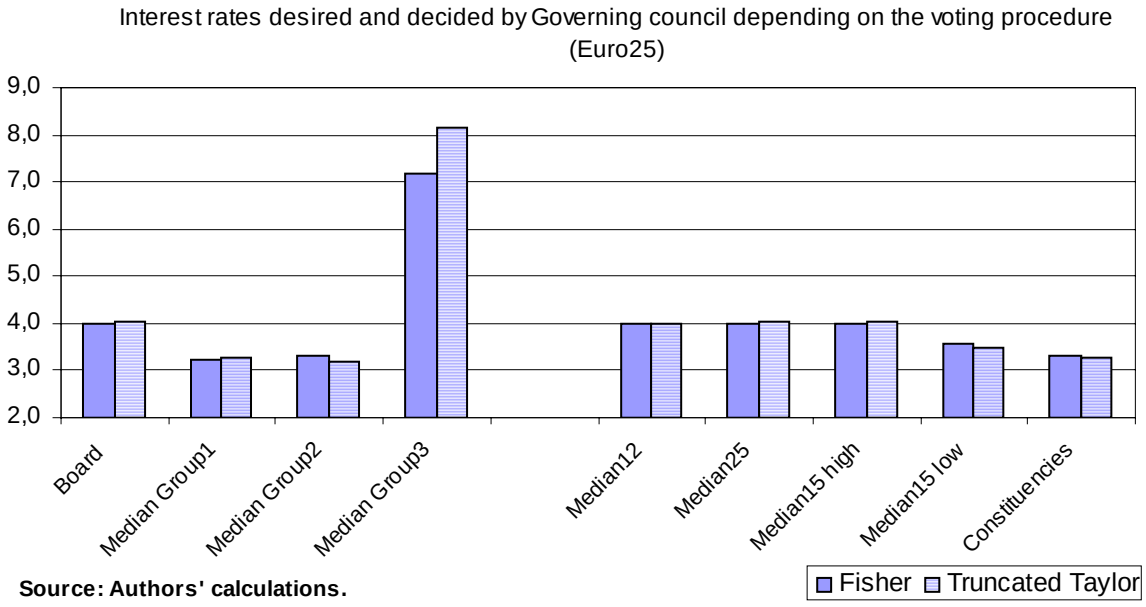
The results for a Euro25 are displayed in Graphs 9 and 10. In the case in which the NCBs entitled to vote are those of each group calling for the highest rates (Median15 high), the results are exactly the same as when all governors have a vote (Median25) and close to the results with only Euro12 governors having a vote (Median12). However, in the case in which only countries with

[12] The selection of the countries is not reproduced in Table 2 because all simulations lead to the same result in the Euro18 case, see below.

the lowest desired votes have a voting right (Median15 low), the interest rate chosen by the GC is much lower. This means that the risk for the rotation system is more of a low interest rate than of a high one. However this risk has a very small probability (basically, only very few drawings correspond to this scenario).

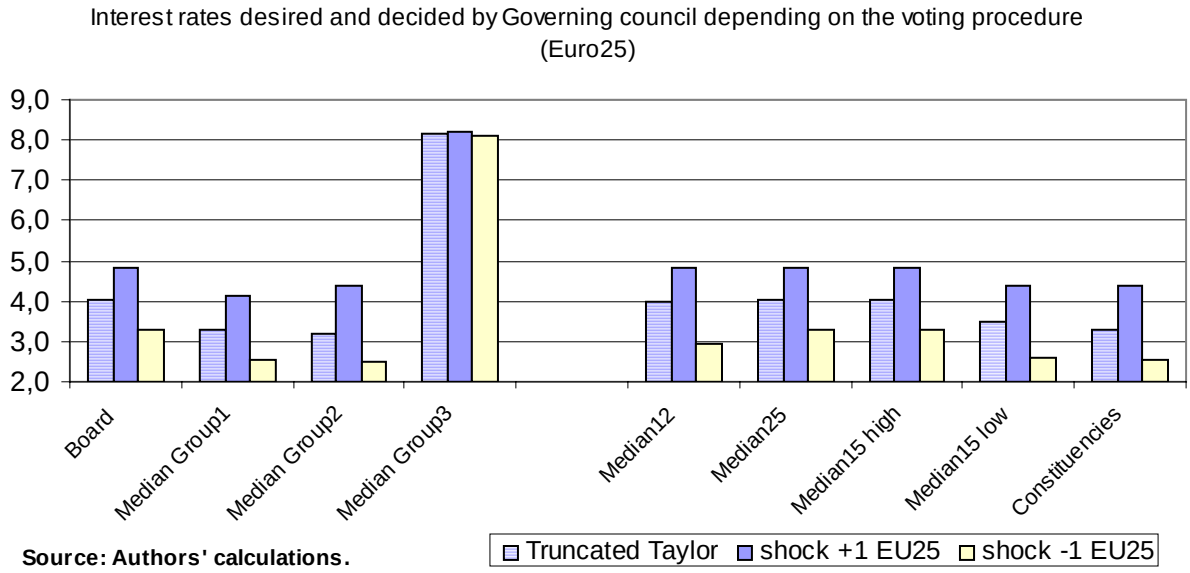
Interestingly, the constituency case can lead to decided rates that are even lower than the Median15 low outcome. This is because the desired rate of the EB is higher than both the median of Group 1 and that of Group 2. Hence Groups 1 and 2 can together have the majority against the Board, despite the fact that some countries in Group 2 disagree with this choice. This situation can significantly favour large, core countries (Group 1) and the majority of Group 2 countries. For Euro12 countries as a whole, this fall in the decided rate (-0.4 to -0.7 percentage point compared to Median12) can usefully compensate for the rise in the desired rate of the EB in the Euro25 compared to the non-enlarged Eurozone (+0.3 to +0.4 percentage point, see *supra*).

Graph 9



Source: Authors' calculations.

Graph 10



Source: Authors' calculations.

Euro22 and Euro18

If UK, Denmark, and Sweden do not join the Eurozone (Euro22 case, see Appendix B), then the interest rate desired by the EB always lies between the median rates of Groups 1 and 2 (the median of Group 2 is higher than in the Euro25 case due to the absence of the Netherlands, Denmark and Sweden from this group, and to the presence of Slovakia, see Table 1). For the constituency rule, this leads to rates in favour of Group 2 (thanks to Group 3), and thus to a decided rate above the Board's choice. Thus, a low rotation of the votes could end up in decided rates that are higher than the desired rate of the EB, whereas in the Euro25 case, the decided rate in the constituency scenario tends to be lower than the desired rate of the Board.

Hence, too slow sequences of rotations could be harmful for the aggregate Euro22, as for large core countries (Group 1). Compared to the Median12, the interest rate is much higher in all cases, the constituency case being the worst scenario. In the case of a negative shock on the Euro25, the gap between the Median12 desired rate and the decided rate in the constituency case amounts to almost 2 percentage points.

In the case of a Euro18 (Appendix C), the Board can impose its choice in all cases due to its high weight (6 votes out of 21) and median position in terms of desired rates. Interestingly, the Median12 desired rate is generally close to the decided rate. The maximum gap is 0.4 (in the case of a negative shock on the Euro25), which is much smaller than in the Euro22 scenarios.

Our results are summarised in Table 3. They show that, in the case of a Euro25, there is no difference between the new rule and the old one (and with complete centralization of monetary

policy), provided the sequence of rotations is fast. If the sequence is slow, then the system could move close to a constituency system, which would favour core Euro countries. However this result only holds for a Euro25. With only 22 countries in the Eurozone, a slow-rotation system would favour high inflation countries whereas a fast-rotation system would make no difference compared to the old rule. Finally, with only 18 countries in the Eurozone, all rules provide the same result as complete centralization.

Table 3: summary results

	Old rule: all countries vote	New rule: fast rotations	New rule: slow rotations
Eurozone25	The Board imposes its choice, which is above but close to the rates desired by Group 1 and Group 2.	The rule can lead to lower rates than the Board's choice, in favour of large/core countries, but with a very small probability.	The rule can lead to much lower rates than the Board's choice, in favour of large/core countries
Eurozone22	The Board imposes its choice, which lies in between the rates desired by Group 1 and Group 2.	The Board imposes its choice., which lies in between the rates desired by Group 1 and Group 2.	The rule can lead to higher rates than the rate desired by the Board, in favour of Groups 2 and 3.
Eurozone18	The Board imposes its choice, which lies in between the rates desired by Group 1 and Group 2	The Board imposes its choice, which lies in between the rates desired by Group 1 and Group 2	The Board imposes its choice, which lies in between the rates desired by Group 1 and Group 2

5. Euro12 losses

For Euro12 countries, enlarging the Eurozone bears a cost which can be decomposed into (i) a rise in the desired rate of the Board and (ii) a change in the balance of powers. Type 1 cost is higher if UK, Sweden and Denmark stay out of the Eurozone. It amounts to 0.3-0.4 percentage point when enlarging from 12 to 25 members, 0.3-0.5 when enlarging from 12 to 18 countries, but 0.7-1.0 when enlarging from 12 to 22 members. Type 2 cost depends both on the perimeter of enlargement and on the frequency of the rotations. In the case of fast rotations, there is no additional cost related to the changing balance of power because the Board is always able to impose its choice. Only in the case of a Euro25 is there a very small probability that the decided rate be lower than the Board's desired rate. In the case of slow rotations, which could resemble a system of constituencies, Type 2 costs are relatively low when enlarging to 18 countries.

In the case of a Euro25, Euro12 countries could benefit from a system of constituencies since this would ensure a lower rate that would compensate for Type 1 cost. However, such a system would be costly for Euro12 countries in a Euro22 because Groups 2 and 3 could together obtain higher rates than the Board's choice. Hence Euro12 countries would rather not suggest such a system before the participation of the UK, Sweden and Denmark is secured.

We now compare the enlargement losses for Euro12 countries, restricting ourselves to Euro25 and Euro22 cases. More specifically, we calculate a loss function of each NCB which is the squared percentage discrepancy between its desired rate i_k and the rate which is selected by the GC, i:

$$L_k = 100 \times \left(\frac{i_k - i}{i_k} \right)^2 \qquad (8)$$

Here unweighted average losses of Euro12 countries are compared before and after enlargement. Before enlargement, all Euro12 NCBs have a voting right and the desired rate of the EB is calculated on the basis of Euro12 (not Euro25) aggregates. After enlargement, not all Euro12 NCBs have a vote, some non-Euro12 NCBs also have a vote and the EB's vote is based on the Euro25 or Euro22 aggregate. Hence both Type 1 and Type 2 costs of enlargement are covered here. The graphs compare the additional loss, for Euro12 countries, when enlarging the Eurozone, across various decision rules:

$$AddLoss = 100 \times \left(\frac{\sum_{k=1}^{12} L_k(EuroN)}{\sum_{k=1}^{12} L_k(Euro12)} - 1 \right) \qquad \text{N = 22 or 25} \qquad (9)$$

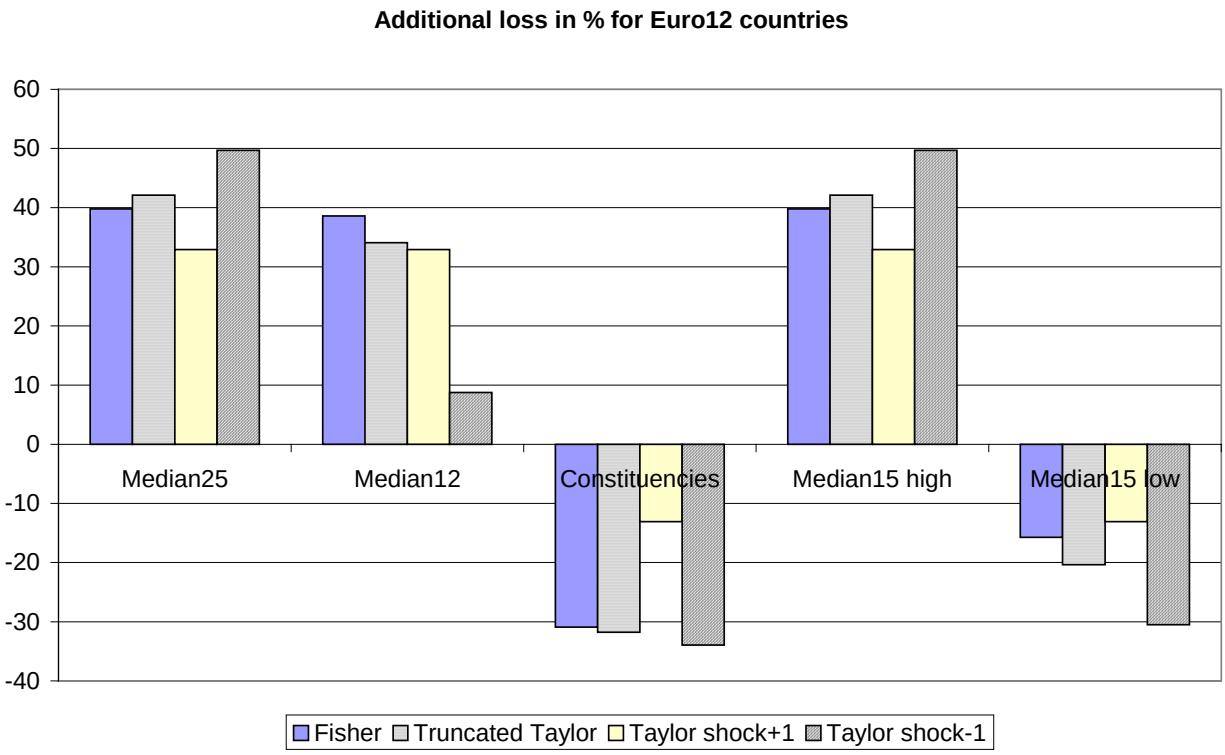
Euro25 case

As evidenced in Graph 11, in the Euro25 case, Euro12 average losses are generally similar whether, in the enlarged Eurozone, all 25 NCBs are entitled to vote (Median25 scenario) or whether only the initial 12 Euro members vote (Median12). Hence, as already mentioned, the loss mainly comes from the shift in the EB vote, which raises its desired rate when the Eurozone is enlarged. This confirms that Type 2 (balance of power) costs are relatively small compared to Type 1 (change in Euro aggregates) costs, for a Euro25. There is one major exception, however: when a negative shock on the EU25 occurs, Euro12 countries are clearly worse-off in an enlarged Eurozone, due to both Type 1 and Type 2 costs.

The Median25 rule, where all 25 NCBs are entitled to vote, yields the same results as the Median15 high rule, where only 15 NCBs have a vote and where these NCBs happen to be those calling for the highest rates. This means that, for old Euro members within a Euro25, the new rule cannot do worse than the old one, but it can do better in the very rare case when the NCBs entitled to vote have low desired interest rates (Median15 low scenario). In the latter case, the unweighted average loss of Euro12 countries is reduced compared to the pre-enlargement case. However, as already mentioned, this scenario is highly improbable.

Finally, the best rule for Euro12 countries would be a constituency rule, because the decided rate lies in between Group 1 and Group 2 desired rates. The problem is that this is the worst system for them when enlarging to 22 countries.

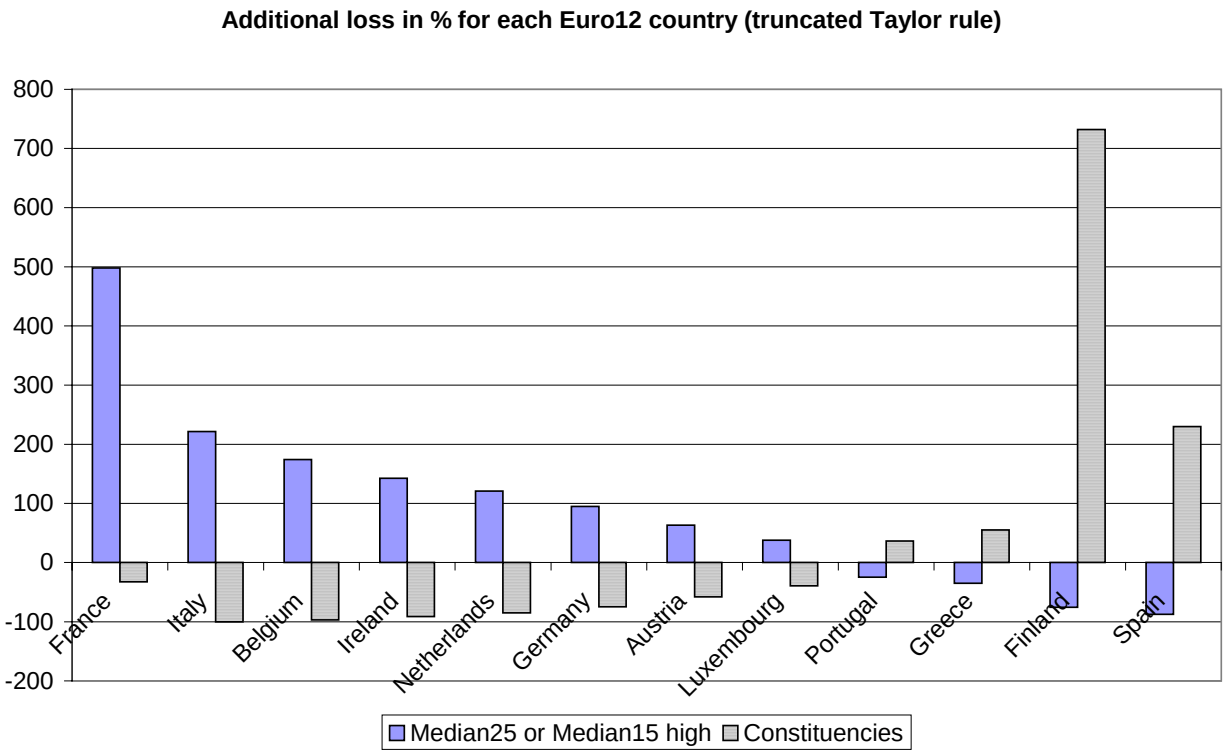
Graph 11: cost, for the Euro12 group, of enlarging the Eurozone to 25 countries



Turning to individual losses, Graph 12 shows that enlargement to 25 countries is especially costly for France, in the case of a Median25 or Median15 high rule, and a truncated Taylor rule.[13] This is because the desired interest rate of France is especially close to the decided rate prior to enlargement. By contrast, four countries would benefit from enlargement since the decided rate would be closer to their desired rates. These are Portugal, Greece, Finland and Spain. Strikingly, these four countries would not favour a constituency system which would entail a positive cost of enlargement for them, whereas all other Euro12 countries would prefer a constituency system.

[13] The results are similar with a Fisher rule (not displayed here).

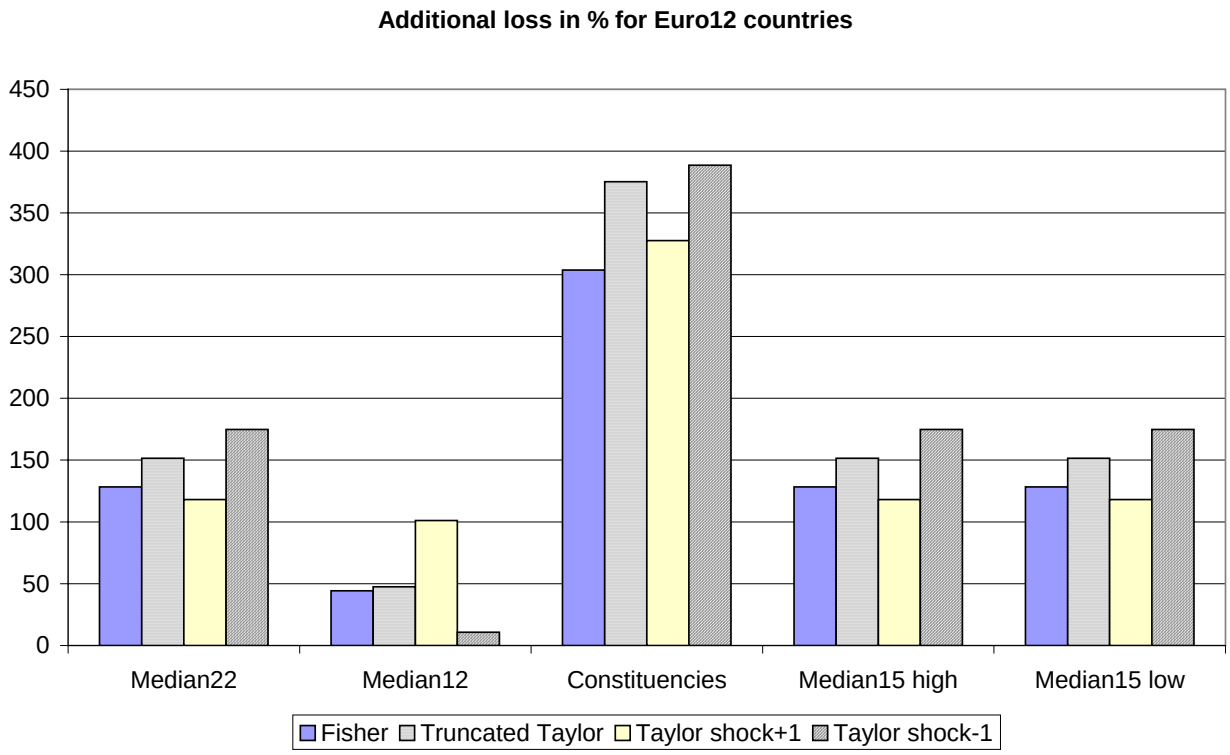
Graph 12: cost, for Euro12 countries, of enlarging the Eurozone to 25 countries



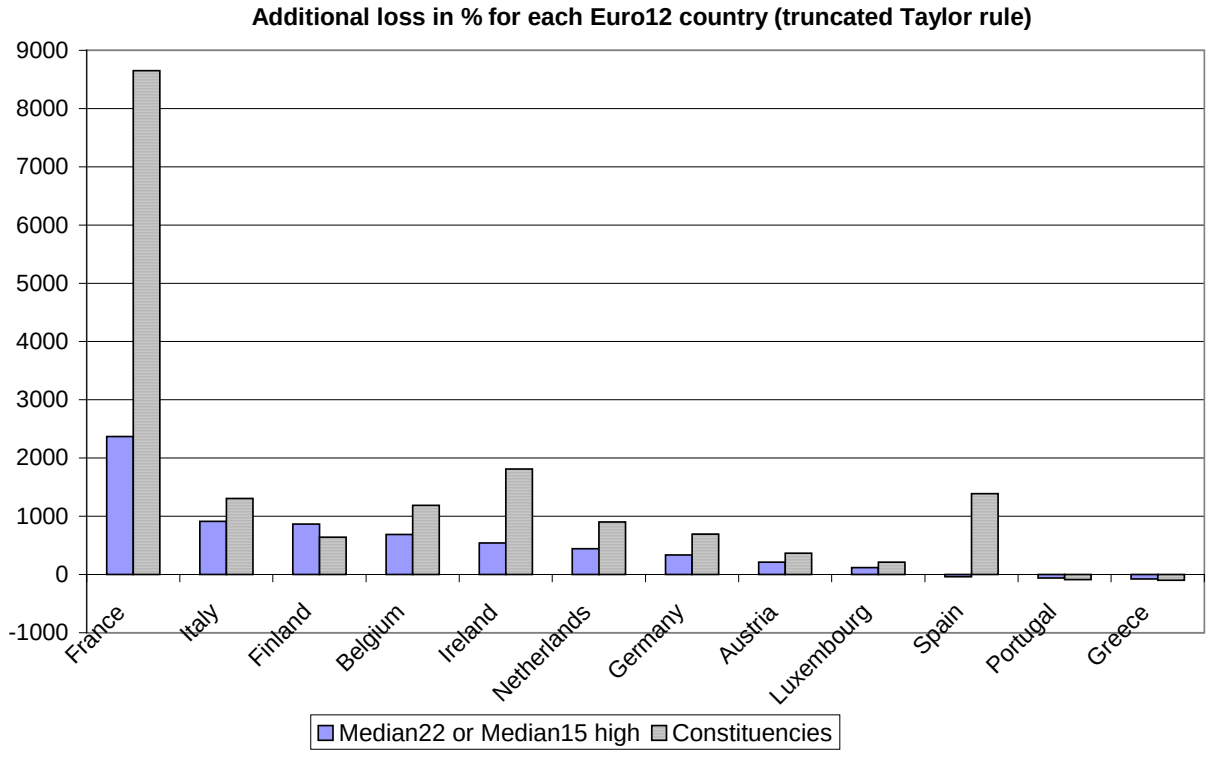
Euro22 case

Graph 13 shows that, in Euro22 case, the cost of enlargement, for Euro12 countries, is much higher, and split between Type 2 costs (Median12 scenario) and Type 1 ones (difference between Median12 and Median22 scenarios). As expected, the cost is lower in the case of a positive aggregate shock but larger in the case of a negative aggregate shock. Strikingly, the constituency scenario now is the most costly for Euro12 countries as a whole, contrasting with what is obtained in the Euro25 case. Graph 14 additionally shows that the constituency scenario is the most costly for all Euro12 countries but Finland, Portugal and Greece.

Graph 13: cost, for the Euro12 group, of enlarging the Eurozone to 22 countries



Graph 14: cost, for Euro12 countries, of enlarging the Eurozone to 22 countries



Contrasting with the UK, Sweden and Denmark, new member states cannot use an opting out clause. In addition, all of them have shown their willingness to join the Eurozone, whereas such willingness has not been clear so far in the three opt-out countries. Hence, the Euro22 scenario can be viewed as more probable than the Euro25 one. Following our analysis, this means that Euro12 countries should favour fast rotations within the GC and that they should perhaps think about reinforcing fiscal policy coordination in order to face negative shocks.

6. Conclusion

In this paper, we provide an assessment of the rotation rule decided by the European Council for the functioning of the Governing Council once the Eurozone is enlarged to 18, 22 and 25 member states. First, desired interest rates by each member of the GC are calculated on the basis of Fisher, truncated Taylor and Taylor rules, successively, and on the basis of a convergence of both GDP per capita and price levels within the EU in 30 years. Then, various decision rules are simulated: the old rule where all GC members are entitled to vote at each meeting, the new rule where only 15 national governors are allowed to vote at a given meeting, a weighted average, a constituency system, and a complete centralization of monetary policy where the Executive Board decides on the interest rate. In order to gauge the losses incurred by old EMU members when the Eurozone is enlarged, we also simulate monetary policy before the enlargement, with the "old" rule.

The main results are the following. First, moving from the "old" rule to the "new" one does not have much impact on the decisions made by the GC in an enlarged Eurozone, should it be with 25, 22 or 18 members, because the median desired rate generally lies within the Executive Board. Hence the cost of enlargement, for Euro12 countries, essentially lies in the higher interest rate desired by the Executive Board. It is more pronounced if the UK, Sweden and Denmark stay out of the Eurozone, because the three outs have relatively low desired rates and the UK would have a relatively high share in Euro25 aggregates. Second, should rotations be relatively infrequent (say once a year), the system could end up close to a constituency system. In this case, core Euro12 countries could be better off in a Euro25 than in the Euro12, because Groups 1 and 2 would be in the position of imposing lower interest rates. However, core Euro12 would be worse off in a Euro22 compared to a Euro12 because Groups 2 and 3 would be able to impose higher interest rates. This underlines the importance, for core Euro12 countries, of UK, Denmark and Sweden joining the Eurozone before large NMS countries join; or, considering that UK, Denmark and Sweden will unlikely join before NMSs, it suggests that core Euro12 countries should ask for fast rotations in order to avoid the risk of monetary policy being dictated by Groups 2 and 3. Third, the results obtained with fast rotations are less dependent on the perimeter of the Eurozone, closer to the Executive Board's desired rate, and more acceptable by all Euro12 members than a constituency system. However, full centralization (where the choice of the interest rate is left to the Executive Board) would deliver the same results, with much lower transaction costs.

The results are shown to be robust to various types of interest-rate rules and various shocks on output gaps. They contrast with pure probabilistic analyses highlighting the loss of influence of the Executive Board and of large Eurozone countries after EMU enlargement. This is because of the median position of the Board in terms of desired interest rates: the Board never asks for extremely low or extremely high interest rates, which ensures its influence within the Governing Council despite loss of voting power.

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Appendix A: the data

- **Industrial production**, 1994-2004 monthly, constant prices, deseasonalised. Source: Eurostat. For Malta, industrial production was not available, hence Greek output gaps were used. The sample starts in 1995 for Austria, Greece and Poland and 1998 for Hungary and Slovenia.

- **GDP per capita in 2004**, in purchasing power parity: source ECB.

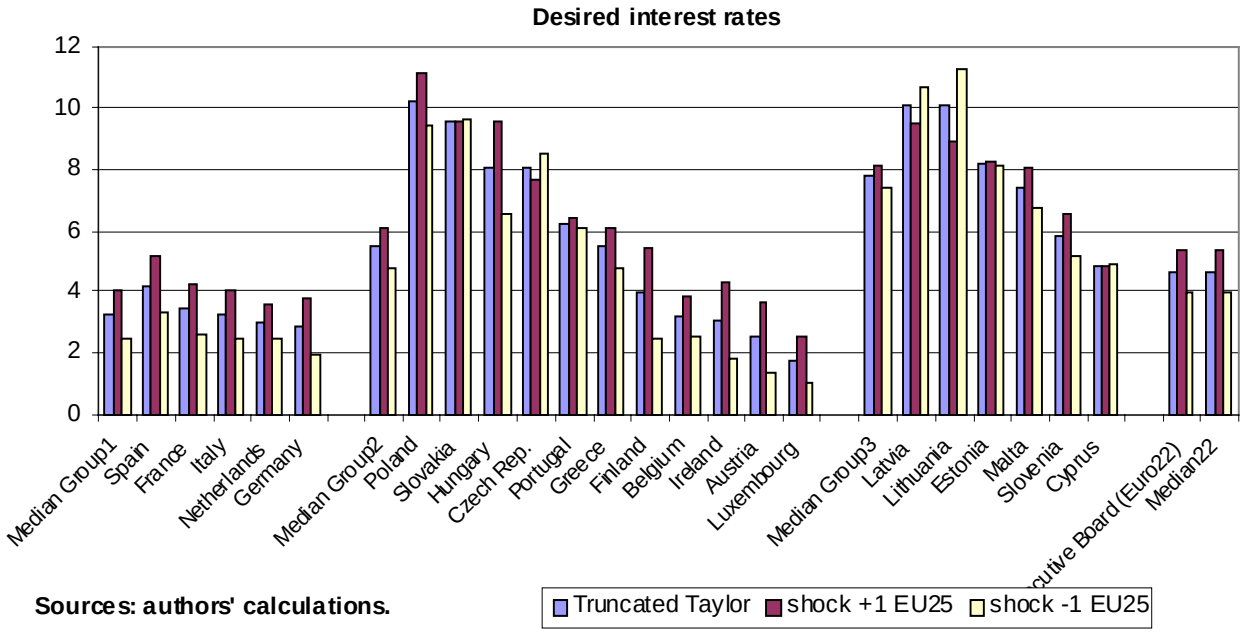
- **Price levels in 2004**: ratio of GDP per capita in current euros to GDP per capita in purchasing power parity. Source: ECB.

- **Labour force growth**, 2004-2034, average year-on-year variation in percentage. Source United Nations. For Cyprus, data were not available, hence Greek figures were used.

- **Country coverage**: 25 EU member states.

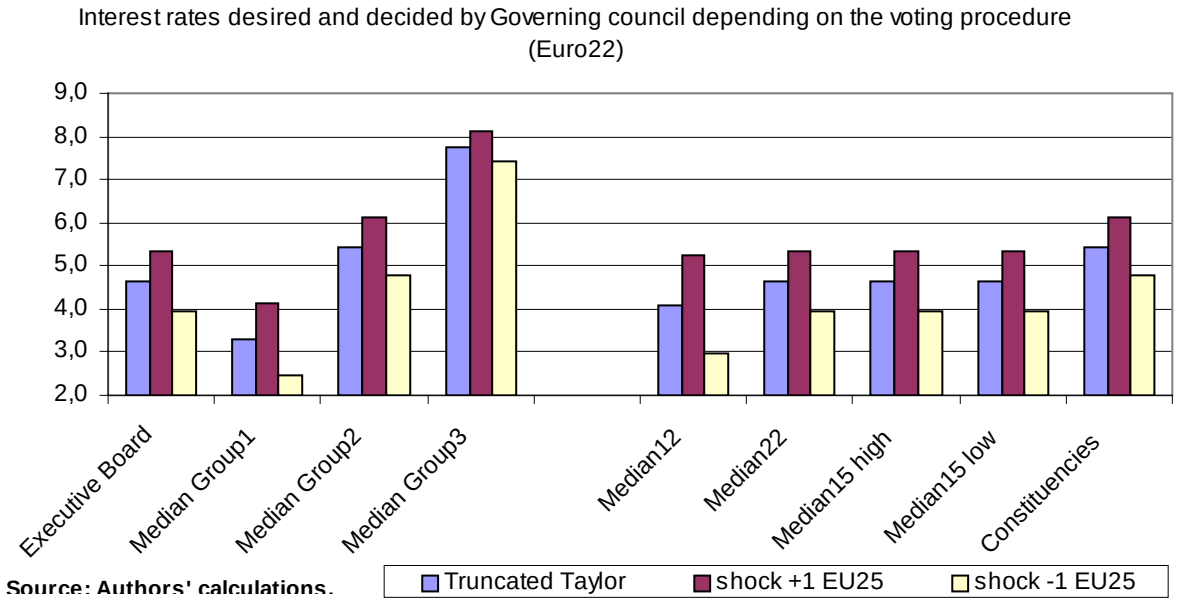
Appendix B: Desired rates and decided rates in a Euro22

Graph B-1



Sources: authors' calculations.

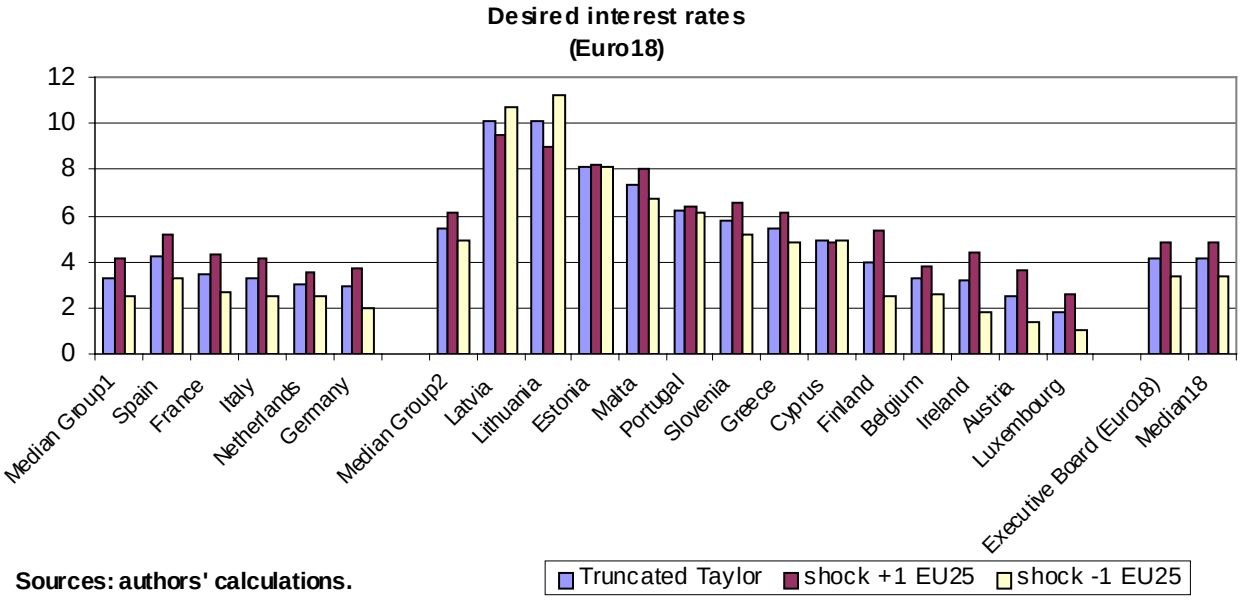
Graph B-2



Source: Authors' calculations.

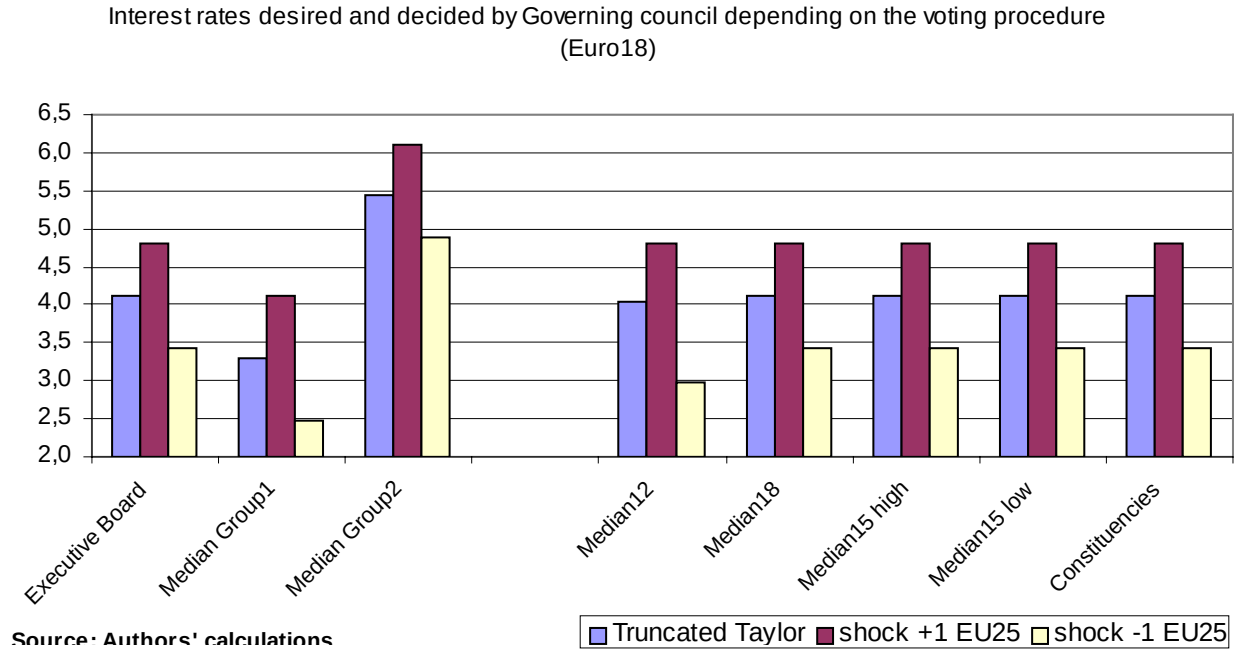
Appendix C: Desired rates and decided rates in a Euro18

Graph C-1



Sources: authors' calculations.

Graph C-2



Source: Authors' calculations