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Monetary Policies in an Enlarged Euroland.

by

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DISCUSSION
PAPER

Monetary Policies in an Enlarged Euroland

Filipa Correia*

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Abstract

This paper analyses the effects of enlarging the initial Euroland of eleven members to one including all the fifteen member states of the European Union. The analysis is done in terms of consequences in the decision-making process and in welfare. In the framework of the model developed by Rudebush and Svensson (1998), and defining two decision rules and two benchmark cases, we find that the addition of the four outsiders does not reduce significantly the strategic position of the ECB-Board in deciding upon monetary policy issues in Euroland. Furthermore, Denmark, Greece and Sweden gain welfare when they enter the Eurosystem, while the UK loses welfare in EMU. The welfare of the initial member countries is not much affected by the enlargement, although a majority of them experience slight welfare gains.

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1 Introduction

To enlarge or not to enlarge is not the question anymore. Talks are being held and preparations are on the way. The Commission's and the Council's reforms are brought about in any conversation that involves the European Union's future prospects. Indeed, the enlargement of the Union will first of all change the shape of these two bodies, and that is seen very likely to happen already in the year 2004. But the enlargement of the Euro-zone itself is also at stake.

Usually, the enlargement issue is discussed in light of the entering of the Central and Eastern European countries (CEEC) into the European Union (EU). In fact, extensive talks have been carried out in order to make this transition as smooth as possible, both for the newcomers and for the current members. The conference in Nice in December 2000 was devoted exactly to the enlargement of the Union, in a (modest) attempt to prepare it for future entries of new member countries. But, in spite of all the talking and the ongoing preparation of the applicants, the whole process of enlargement has still to go through quite some stages. One of them will be the access to the Economic and Monetary Union (EMU) by those countries who will join the EU in a first enlargement.

In what concerns the EMU, though, before taking into consideration the entering of the CEEC (which is due at the earliest in 2006) it may be worthwhile to take a look at Euroland comprising the countries that make up the European Union today. What would be the consequences of enlargement of the Euro-zone to the whole European Union? The answer to this question will provide us with some hints on important aspects to take into consideration when studying further extensions of the EMU.

The purpose of this paper is, thus, to analyse the entry of Denmark, Greece, Sweden and the United Kingdom - the four members of the EU initially non-members of the EMU - into Euroland[1]. What does this entrance mean, both to the four entering countries and the initial eleven members of the Euro-zone, in terms of welfare?

The Eurosystem, consisting of the European Central Bank (ECB) and the national Central Banks (NCBs), is responsible for the monetary policy. Decisions are taken within the Governing Council. The Governing Council is composed of the governors of the NCBs of the member countries, and of the Executive Board of the ECB, which consists of the President of the ECB, the Vice-President and four Directors. The voting principle in the Governing Council is based on the premise "one person, one vote". It could be said that the Governing Council represents the national states while the Executive Board represents the ECB itself, that is, the EMU as a whole. It should be noted, though, that the ECB is keen on stressing the fact that the members of its decision-making bodies should not act as national representatives when performing any task concerning the Eurosystem[2]. Nevertheless, due to different adjustment mechanisms or economic conditions, there will

[1] In fact, at the time we are writing this paper Greece is already part of the Economic and Monetary Union. Nevertheless, our analysis falls on the comparison between the initial Euroland (without Greece) and the enlarged Euroland, where Greece enters the EMU together with Denmark, Sweden and the United Kingdom.

[2] ECB Annual Report 1999

be diverse optimal interest rates that the different countries would like to apply. This could lead the members of the Governing Council - and, in a more extreme scenario, the Executive Board - to vote upon monetary policies taking a national viewpoint, creating tensions and conflicts. One of the questions we want to analyse is whether and how the entering of new members in the Eurosystem will affect this decision-making process.

In order to analyse these issues, we use the model developed by Rudebusch and Svensson (1998), which we briefly present in section 2. Estimations of the model are made in section 3. In section 4, we simulate the voting procedure and compute the resulting interest rate, output level and inflation rate to obtain the welfare losses. We analyse the performance of countries both in the initial EMU (with eleven members) and in the enlarged one (with fifteen members). The contrast between the two will allow us to find out what are the welfare gains and losses of enlarging Euroland. In addition, it will make it possible to study whether the decision-making process is affected by the enlargement. Finally, in section 5 we conclude.

2 Modeling optimal linear feedback rules

We take the general framework of Rudebush and Svensson (1998) and define the aggregate demand relation as given by:

$$y_{t+1} = \sum_{j=1}^{m} \beta_{y,j} y_{t+1-j} + \beta_r \left(\bar{i}_t - \bar{\pi}_t\right) + \eta_{t+1}, \tag{1}$$

where y measures the transition component of output ($-y$ measures the output gap) and $\bar{i}_t$ and $\bar{\pi}_t$ denote four-quarter moving averages of interest and inflation rates, respectively:

$$\bar{i}_t = 1/4 \sum_{i=0}^{4} i_{t-i} \quad \text{and} \quad \bar{\pi}_t = 1/4 \sum_{i=0}^{4} \pi_{t-i}.$$

The aggregate supply relation is derived from an autoregressive Phillips curve and is given by:

$$\pi_{t+1} = \sum_{j=1}^{n} \alpha_{\pi,j} \pi_{t+1-j} + \alpha_y y_t + \varepsilon_{t+1}. \tag{2}$$

We depart from Rudebush and Svensson's paper in what concerns m and n: we let the lag structures for inflation and output vary across the different countries. Tests on the number of lags were done taking one (the previous quarter) as the minimum and eleven (the previous two years) as the maximum lag length and computing Akaike's Information Criteria (AIC) on each possible lag structure for equations (1) and (2) for each country.

The economic system represented by equations (1) and (2) can be written in a state space representation of the form

$$X_{t+1} = AX_t + Bi_t + v_{t+1}, \tag{3}$$

where X_t is a $(n+m+3) \times 1$ vector of state variables (inflation rates, output gaps and interest rates), A is a $(n+m+3) \times (n+m+3)$ matrix, B is a $(n+m+3) \times 1$ vector with all elements zero except for the $(n+1)$-th and the $(n+m+1)$-th, and v_t is a $(n+m+3) \times 1$ error vector where all elements are zero except for the first and the $(n+1)$-th. Specifically:

$$X_t = \begin{bmatrix} \pi_t \\ \pi_{t-1} \\ \vdots \\ \pi_{t-n+1} \\ y_t \\ y_{t-1} \\ \vdots \\ y_{t-m+1} \\ i_{t-1} \\ i_{t-2} \\ i_{t-3} \end{bmatrix}, \; A = \begin{bmatrix} \sum_{j=1}^{n} \alpha_{\pi,j} e_j + \alpha_y e_{n+1} \\ e_1 \\ \vdots \\ e_{n-1} \\ -\beta_r e_{1:4} + \sum_{j=1}^{m} \beta_{y,j} e_{n+j} + \beta_r e_{n+m+1:n+m+3} \\ e_{n+1} \\ \vdots \\ e_{n+m-1} \\ e_0 \\ e_{n+m+1} \\ e_{n+m+2} \end{bmatrix} \; B = \begin{bmatrix} 0 \\ 0 \\ \vdots \\ 0 \\ \frac{\beta_r}{4} \\ 0 \\ \vdots \\ 0 \\ 1 \\ 0 \\ 0 \end{bmatrix} \text{ and } v_t = \begin{bmatrix} \varepsilon_t \\ 0 \\ \vdots \\ 0 \\ \eta_t \\ 0 \\ \vdots \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$

where e_j denotes a $1 \times (n+m+3)$ vector with all elements equal to zero but the j-th which is equal to one, and $e_{i:j}$ is a $1 \times (n+m+3)$ vector with $1/4$ from column i till column j and zero elsewhere.

In order to write an expression for the optimal linear feedback rule, it is convenient to define the Central Bank's goal variables in terms of the state vector X_t, such as:

$$Y_t = \begin{bmatrix} \bar{\pi}_t \\ y_t \\ i_t - i_{t-1} \end{bmatrix} = C_X X_t + C_i i_t, \tag{4}$$

where

$$C_X = \begin{bmatrix} e_{1:4} \\ e_{n+1} \\ -e_{n+m+1} \end{bmatrix} \text{ and } C_i = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}.$$

In line with Rudebush and Svensson (1998), we assume that the Central Bank wishes to minimize the following loss function:

$$\min_{i_t} \sum_{j=0}^{+\infty} \delta^j E_t \left[\left(\bar{\pi}_{t+j} - c_1\right)^2 + \lambda \left(y_{t+j} - c_2\right)^2 + \gamma \left(i_{t+j} - i_{t+j-1}\right)^2 \right],$$

where c_1 and c_2 are the target values for the inflation rate and output, respectively. In words, the Central Bank wants to minimize inflation's, output's and interest rates' volatilities because it realizes that the more volatile these variables are, the more the uncertainty and the bigger the effort in screening and intervening in the economy. In the optimization process, the monetary authority confers different weights to the stabilization of the three variables. The weight put on inflation is normalized to one. If there is a big concern about output stabilization, for example, λ will be relatively larger and this will result in low output variance around c_2 and relatively higher variances of inflation and interest rates. The results in terms of total loss will depend on the magnitude of these preferences parameters and also on the estimated coefficients in (1) and (2).

If we assume that the Central Bank values the future discrete losses highly (or, put differently, that the meetings of the Governing Council are sufficiently frequent so that the function is constantly being optimized) we can set $\delta = 1$ and think in terms of an unconditional loss function:

$$\min_{i_t} E\left[L_t\right] = Var\left[\left(\bar{\pi}_t - c_1\right)\right] + \lambda Var\left[\left(y_t - c_2\right)\right] + \gamma Var\left[\Delta i_t\right],$$

which can be written in terms of (4) in the following way[3]:

$$L_t = E\left[Y_t' K Y_t\right], \tag{5}$$

where

$$K = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \lambda & 0 \\ 0 & 0 & \gamma \end{bmatrix}$$

[3]The series used in the estimation are demeaned, so the target values do not appear in the especification.

is the preferences matrix.

An optimal linear feedback rule is a linear relation between the instrument (interest rate) and the state of the economy. That is, this class of rules takes the following form:

$$i_t = fX_t \tag{6}$$

where f is a $1 \times (n+m+3)$ vector. Substituting (6) into (3) and (4), we have that

$$X_{t+1} = MX_t + v_{t+1} \tag{7}$$

and

$$Y_t = CX_t \tag{8}$$

with

$$M = A + Bf \quad \text{and} \quad C = C_X + C_i f.$$

Thus, the Central Bank minimizes (5) subject to (7) and (8), with argument i_t, to obtain its policy rule, given by[4]:

$$i_t = -\left(R + B'VB\right)^{-1}\left(U' + B'VA\right)X_t, \tag{9}$$

where V is

$$V = Q + Uf + f'U' + f'Rf + M'VM,$$

$$Q = C_X'KC_X,\ U = C_X'KC_i \quad \text{and} \quad R = C_i'KC_i.$$

3 Estimation of the model

3.1 Analysis of the coefficients

In this section we estimate the aggregate demand and supply relations (equations (1) and (2), respectively) and the optimal feedback rule (equation (9)).

We use quarterly data from the IMF International Financial Statistics for Industrial Production (for Portugal and Greece, Industrial Production data was taken from the OECD Statistical Compendium), Consumer Price Index figures and short-term interest rates, ranging from the first quarter of 1979 to the third quarter of 1997. Interest rates are annualized money market and call money rates, except for Finland (average bank lending rate), Ireland (STF rate - end of period), Portugal (lending rate), Greece (3-12 months deposit rate of commercial banks), and the UK (Treasury Bill rate). Given the long-dated Monetary Union between Belgium and Luxembourg, we take the Belgian interest rate to apply to Luxembourg also. Inflation rates are built by annualizing the difference of the

[4]See Rudebush and Svensson (1998) for details on the derivation of the optimal feedback rule vector.

logarithms of the CPI at time t and time $t-1$. Finally, output gaps are computed by taking the logarithm of the detrended industrial production[5].

We mentioned in section 2 that the number of lags adopted for output and inflation was analysed in a country-specific procedure. The structure corresponding to the minimum AIC value was used, except when this would result in an unstable system. The system is unstable when the A matrix or the M matrix have their eigenvalues larger than unity in absolute value. In this case, we proceeded by taking the structure corresponding to the second best AIC value and checking for stability. This procedure was followed until a stable lag structure was found. The lag structures taken in estimation and simulation were the following:

Table 1: **Lag structures for the EU countries**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa	den	gre	swe	uk
output lags	3	5	1	7	2	1	11	2	5	1	8	1	1	8	10
inflation lags	6	11	11	11	9	11	11	11	5	5	5	10	5	5	8
AIC optimal	no	no	yes	yes	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes

In each case, the eigenvalues of both matrices lie within the unit circle.

In Tables 2 and 3 we present the estimated coefficients of aggregate demand and supply equations ((1) and (2) from section 2, respectively).

Table 2: **Estimated coefficients of aggregate demand**

	$\beta_{y,1}$	$\beta_{y,2}$	$\beta_{y,3}$	$\beta_{y,4}$	$\beta_{y,5}$	$\beta_{y,6}$	$\beta_{y,7}$	$\beta_{y,8}$	$\beta_{y,9}$	$\beta_{y,10}$	$\beta_{y,11}$	β_r
aus	0.938	-0.015	-0.132									-0.063
bel	0.171	0.185	0.074	0.118	-0.046							-0.281
fin	0.723											-0.059
fra	0.825	0.0024	-0.014	0.150	-0.238	-0.189	0.295					-0.133
ger	0.859	-0.063										-0.124
ire	0.730											-0.037
ita	0.775	-0.116	0.179	-0.012	-0.180	-0.046	0.063	-0.208	0.116	0.212	-0.279	-0.317
lux	0.794	-0.079										-0.082
net	0.384	0.105	0.145	0.189	-0.275							-0.016
por	0.749											-0.052
spa	0.780	-0.025	0.124	0.236	-0.576	0.066	-0.116	0.270				-0.009
den	0.601											-0.307
gre	0.357											-0.028
swe	0.400	0.407	0.020	-0.009	-0.040	-0.033	0.033	-0.228				-0.164
uk	1.033	-0.339	0.023	-0.048	0.156	0.024	-0.062	-0.189	0.271	-0.214		-0.083

[5]We detrend by applying a Hodrick-Prescott filter with $\lambda = 1600$, which is the suggestion of the authors of this technique for quarterly data.

Table 3: **Estimated coefficients of aggregate supply**

	$\alpha_{\pi,1}$	$\alpha_{\pi,2}$	$\alpha_{\pi,3}$	$\alpha_{\pi,4}$	$\alpha_{\pi,5}$	$\alpha_{\pi,6}$	$\alpha_{\pi,7}$	$\alpha_{\pi,8}$	$\alpha_{\pi,9}$	$\alpha_{\pi,10}$	$\alpha_{\pi,11}$	α_y
aus	0.042	0.095	0.173	0.435	0.002	-0.101						0.015
bel	0.348	0.089	0.180	0.246	-0.124	0.224	0.004	0.146	-0.156	0.050	-0.217	0.019
fin	0.572	-0.300	0.243	0.337	0.002	0.010	0.131	-0.066	0.026	-0.275	0.172	0.052
fra	0.334	-0.006	0.121	0.172	-0.058	0.189	0.105	0.229	0.009	-0.259	-0.035	-0.005
ger	0.288	-0.004	-0.023	0.362	-0.077	0.167	0.032	-0.259	0.146			0.050
ire	0.022	0.218	0.368	-0.015	-0.154	0.029	0.025	0.472	0.011	-0.088	-0.187	0.050
ita	0.561	-0.118	0.100	0.278	-0.104	-0.054	0.040	0.375	-0.323	0.197	-0.074	0.162
lux	0.426	-0.056	0.204	0.362	-0.074	0.288	-0.071	-0.280	0.162	-0.432	0.225	-0.059
net	0.276	0.219	0.007	0.546	-0.249							0.109
por	0.477	0.147	0.275	-0.073	0.063							0.112
spa	0.084	0.043	0.263	0.293	0.216							0.097
den	0.014	0.148	-0.153	0.369	0.136	0.115	-0.004	0.025	-0.063	0.136		0.050
gre	0.415	-0.205	0.383	0.137	0.190							0.620
swe	0.181	0.244	0.259	0.104	-0.023							0.115
uk	0.512	0.059	-0.131	0.223	-0.126	0.208	0.243	-0.218				0.237

France and Luxembourg exhibit a price puzzle: their coefficients for output in aggregate supply are negative. That is, when output goes up, ceteris paribus, inflation tends to decrease.

The first-lag coefficients for output and inflation, the coefficients for the moving average of equation (1) and the coefficients for output in equation (2) are plotted in Figure 1.

From Tables 2 and 3 and Figure 1 we observe that, on average, first output coefficients are higher than first inflation coefficients. Taking into consideration also the lag lengths in Table 1, we can say that a random shock will cause a stronger response and will die out faster for output than for inflation.

Looking at the estimated coefficients in the last column of Table 3, we conclude that inflation is not very responsive to output changes. Moreover, for France and Luxembourg it responds in an opposite direction than expected (price puzzle). This responsiveness of inflation to output changes is higher for Italy, Greece, Sweden and the UK.

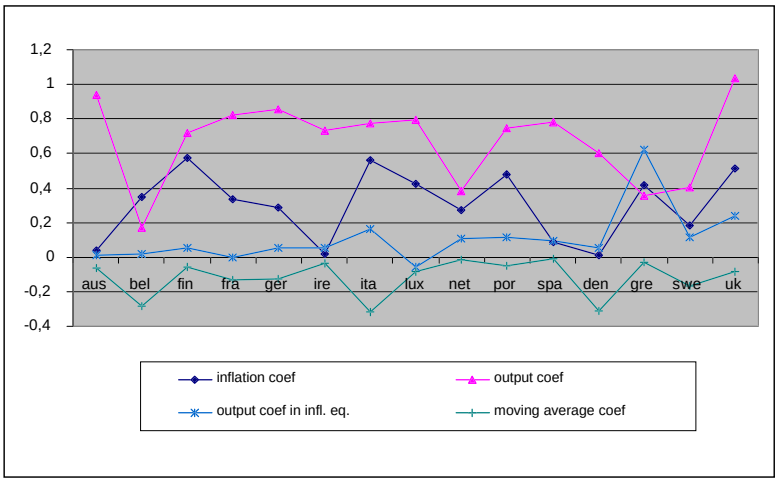
To analyse the coefficients of the moving average in the aggregate demand equation, it is convenient to present the estimates for the coefficients of the optimal feedback rules (equation (9)) that are plotted below in Figures 2, 3 and 4[6][7]. Here the first optimal coefficients are contemporaneous values for inflation and output, and one-period-lagged values for the interest rate.

In Figure 4 we can see that the Netherlands and Spain have the highest interest rate smoothing parameters in the optimal rule across all preferences. This means that the

[6]Where 1 stands for the Central Bank's preferences $(1, \lambda = 0.2, \gamma = 0.5)$, 2 for $(1, \lambda = 1, \gamma = 0.5)$, 3 for $(1, \lambda = 1, \gamma = 0.25)$, 4 for $(1, \lambda = 5, \gamma = 0.5)$, 5 for $(1, \lambda = 1, \gamma = 1)$, and 6 for $(1, \lambda = 1, \gamma = 5)$.

[7]See Tables 6-11 in the Appendix for the values of the optimal feedback rule coefficients for the different Central Bank's preferences.

Figure 1: Estimation results (first lagged coefficients only)



interest rate process is very inert in these countries and the impact of changes in the economic system on the interest rate is basically through its lagged value, leaving few room for feedback impacts through output or inflation (thus the low optimal rule coefficients for inflation and output that we see in Figures 2 and 3, respectively). The moving average coefficient on the aggregate demand relation of these countries (see Figure 1) is extremely low, indicating that the reverse - that is, that output (and, through it, inflation) is not very responsive to changes in the interest rate - also holds. Conversely, Italy and Belgium's interest rate smoothing parameters are very low and their moving average coefficients high (in absolute value).

Figure 2: First optimal rule coefficients for inflation

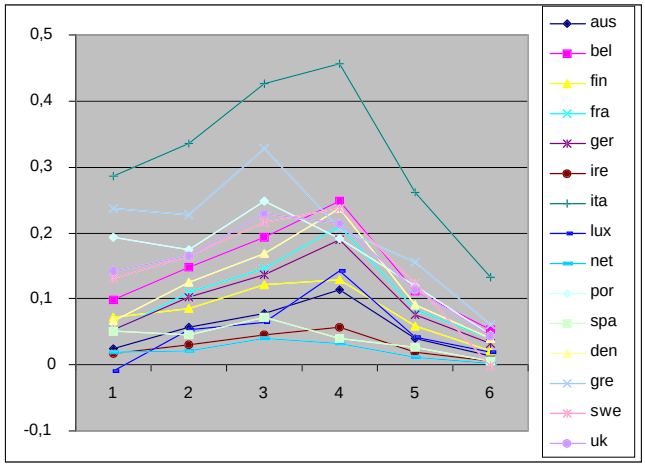
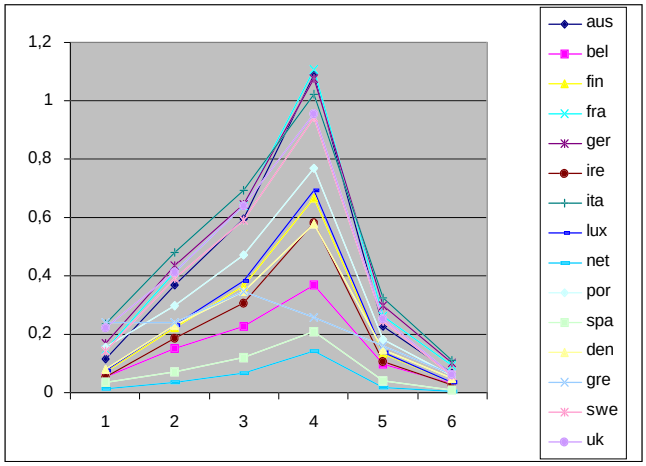
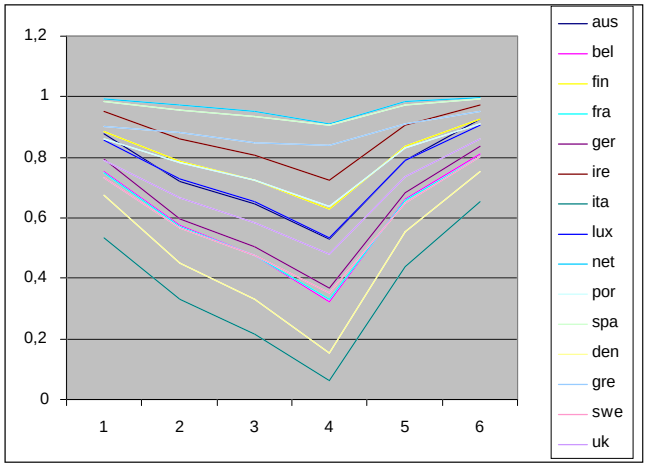


Figure 3: First optimal rule coefficients for output



When we look at the four newcomers (in the context mentioned earlier), we see that Denmark has a very low interest rate smoothing parameter and Greece has a relatively high one. The relation between the first optimal coefficient for interest rates and the coefficient of the moving average in aggregate demand just stated above would indicate that Denmark has a high moving average coefficient and Greece a low one. A look at Figures 1 and 4 confirms these findings. Sweden and the United Kingdom lay in between the initial Eurolanders.

Figure 4: First optimal rule coefficients for interest rates



3.2 Impact responses

We now look at the impact responses of output and inflation when there is a one-period increase of 1% in the interest rate, plotted in Figure 13 of the Appendix.

The stability of the system can be checked by analysing these plots. All countries converge some time after the shock, although the convergence path is different in every case due to the different propagation mechanisms. In an unstable system, there would not be convergence.

The difference between output and inflation responses confirm that the response of output to a 1% rise in the interest rate is stronger and more condensed in time, reaching its trough one year after the shock took place. This timing can be due to the fact that interest rates come in yearly moving averages and, thus, reach the highest value one year after they were first changed. The impact is bigger in France, Italy, Sweden and the UK. The countries which have a very high interest rate smoothing parameter (see Figure 4) are only slightly disturbed by the shock. Greece, though, experiences a very slow adjustment of both output and inflation.

4 Decision-making process and welfare

4.1 Decision scenarios

We consider two different voting scenarios. In the first scenario - the "ECB rule" - the ECB (Executive Board) takes a Euroland-wide perspective in deciding about the interest rate but the other members of the Governing Council take a nationalistic perspective. The desired interest rate of the ECB is, thus, given by

$$d_{EMU,t} = \sum_{i=1}^{k} \omega_i i_{i,t},$$

with $k = 11$ or $k = 15$, depending on whether we are taking into consideration the initial Euroland or the enlarged one, and ω_i the weight of country i in the EMU loss function. We take these weights to be the capital share in the ECB of each national Central Bank (normalized to sum up to the unity, in the case of the initial Euroland) because these weights are a function of the countries' GDP and population as a fraction of EMU's aggregate GDP and population[8]. The desired interest rate by country i will be:

$$d_{i,t} = i_{i,t} = -\left(R_i + B_i' V_i B_i\right)^{-1} \left(U_i' + B_i' V_i A_i\right) X_{i,t}. \tag{10}$$

[8]The weights for the initial Euroland are: for Austria 0.0299, for Belgium 0.0366, for Finland 0.0177, for France 0.2138, for Germany 0.3093, for Ireland 0.0106, for Italy 0.1896, for Luxembourg 0.0019, for The Netherlands 0.0542, for Portugal 0.0244 and for Spain 0.1119. When we comprise all EU members in the EMU, the weights are: for Austria 0.0237, for Belgium 0.0289, for Finland 0.01399, for France 0.1687, for Germany 0.2441, for Ireland 0.0084, for Italy 0.1496, for Luxembourg 0.00147, for The Netherlands 0.0428, for Portugal 0.01925, for Spain 0.0883, for Denmark 0.01657, for Greece 0.0206, for Sweden 0.0266 and for the United Kingdom 0.1471.

In the second scenario - the "Nationalistic rule" - all members of the Governing Council, including the Executive Board members, take a nationalistic viewpoint in deciding upon the interest rate to apply in Euroland, each of which having as desired interest rate the result of equation (10) applied to its own country. When all members act as national representatives, Finland, France, Germany, Italy, the Netherlands and Spain will have two votes instead of one because these are the national countries of the members of the Executive Board.

The voting procedure is organized as follows. We assume that the President of the ECB proposes a particular interest rate. This interest rate will become the decided one unless there is a majority of votes against it. This means there will have to be 9 members to vote against the proposed rate when we consider the initial Euroland (since there are 17 votes - 11 national representatives and 6 ECB representatives) and 11 votes against it when we consider the 15 countries (21 votes - 15 national representatives and 6 ECB representatives). If such voting result occurs, then the President will put to scrutiny the national desired interest rate which is closest to the one presented in the first place. This amounts to having a median voter outcome[9].

Additionally to these voting schemes, we present two benchmarks. The reason for presenting two additional features is that the new entrants have taken different positions vis a vis the EMU. For instance, Denmark pegged its currency to the German mark like the countries of the EMU had in the Exchange Rate Mechanism of the European Monetary System (EMS), and it is currently part of the ERM II. On the other hand, this is not the case for the British pound, which follows its own monetary policy and has its currency floating freely. Therefore, it is reasonable to compare the situation in the EMU with the one in the EMS for Denmark, and with the one of independent monetary policy for the UK.

Hence, the first benchmark is descriptive of the situation during the EMS period - thus called "EMS rule" - when all countries had their interest rates in some way pegged to Germany's interest rate. In this rule, Germany's optimal interest rate is taken by the ECB to apply to the whole EMU. That is, the desired interest rate for each country i is:

$$d_{i,t} = i_{ger,t} = -\left(R_{ger} + B'_{ger} V_{ger} B_{ger}\right)^{-1} \left(U'_{ger} + B'_{ger} V_{ger} A_{ger}\right) X_{ger,t}$$

The second additional scenario - simply called "Benchmark rule" - considers the case where the countries just minimize their loss functions and, so, optimize their welfare as having their own monetary authorities. In this rule, countries apply their optimal interest rate given by equation (9).

Intuitively, the more different the economies are, the more asymmetric the shocks among the countries will be. On the other hand, the more asymmetric the shocks are, the higher is the tension in the Governing Council at the time of deciding upon monetary policy. The asymmetry of the shocks is taken into account in our simulations. We take country-specific shocks by means of a Cholesky decomposition of the covariance matrices of output and inflation shocks. If we take Ω and Λ to be the covariance matrices of output and inflation

[9] As argued in De Grauwe, Dewachter and Aksoy (1998)

shocks, respectively[10], the Cholesky decomposition yields the upper triangular matrices P and L such that $\Omega = P'P$ and $\Lambda = L'L$. The shocks are created, then, by assuming that the past structure is verified. Therefore, we multiply P and L by a vector of stochastic standard normal distributed variates, ξ_t and ς_t. The shocks for output and inflation are thus $\eta_t = P\xi_t$ and $\varepsilon_t = L\varsigma_t$, respectively.

The consequences of taking different decision-making processes will be reflected in the final interest rate decided to come into force in Euroland, but also in the welfare losses borne by the countries.

4.2 Who decides in Euroland?

In a first set of simulations, we analyse the influence the ECB-Board has on the decision-making process in Euroland, both with 11 and with 15 members.

4.2.1 Before enlargement

Figure 5: Correlations between desired and decided interest rates in the initial Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	ECB
						(λ= 0.2,ν= 0.5)						
ems	95,11%	94,79%	95,56%	88,89%	100,00%	96,14%	39,59%	96,54%	96,46%	83,56%	95,33%	66,34%
ecb	90,68%	89,91%	92,32%	83,67%	90,79%	95,55%	66,16%	94,90%	96,77%	72,02%	92,97%	99,67%
nat	83,94%	83,65%	91,48%	75,89%	75,02%	95,22%	19,71%	92,95%	98,32%	58,17%	91,96%	-
						(λ= 1, ν= 0.5)						
ems	81,74%	83,72%	88,65%	65,32%	100,00%	89,94%	12,41%	90,45%	91,65%	80,28%	90,54%	75,51%
ecb	68,29%	70,06%	80,41%	70,89%	84,95%	84,66%	49,63%	82,65%	91,83%	66,78%	87,95%	99,56%
nat	55,31%	57,72%	79,70%	58,44%	61,77%	79,22%	10,02%	73,91%	95,67%	51,83%	88,33%	-
						(λ= 1, ν= 0.25)						
ems	69,92%	66,30%	82,91%	53,30%	100,00%	84,57%	0,03%	84,97%	89,02%	72,43%	86,98%	78,39%
ecb	55,81%	46,85%	70,21%	66,46%	83,47%	75,44%	45,05%	72,21%	88,59%	58,78%	82,17%	99,50%
nat	48,62%	34,75%	71,97%	53,84%	57,07%	70,40%	11,58%	63,84%	93,26%	46,95%	82,99%	-
						(λ= 5.0,ν= 0.5)						
ems	51,71%	34,15%	70,91%	34,09%	100,00%	71,59%	-2,68%	70,83%	82,31%	65,54%	79,25%	80,36%
ecb	46,48%	22,81%	57,56%	62,37%	80,98%	60,34%	37,72%	57,84%	82,25%	53,69%	73,85%	99,37%
nat	45,09%	20,36%	66,17%	46,52%	56,26%	58,41%	4,29%	52,55%	89,14%	44,86%	76,24%	-
						(λ= 1.0,ν= 1.0)						
ems	89,56%	90,83%	92,47%	76,79%	100,00%	92,87%	36,13%	93,80%	93,85%	87,84%	93,28%	75,54%
ecb	79,34%	81,33%	87,40%	76,69%	87,80%	90,17%	57,97%	90,06%	94,31%	76,36%	92,18%	99,61%
nat	64,07%	67,04%	82,52%	62,78%	62,97%	84,82%	20,20%	81,71%	96,81%	60,48%	92,21%	-
						(λ= 1.0,ν= 5.0)						
ems	96,71%	96,51%	97,30%	92,18%	100,00%	97,42%	78,28%	97,62%	97,48%	95,63%	97,36%	66,50%
ecb	94,96%	94,33%	96,78%	90,14%	93,23%	97,51%	79,16%	97,49%	97,97%	91,67%	97,60%	99,74%
nat	85,90%	85,60%	94,80%	69,56%	71,72%	96,54%	46,72%	95,33%	98,89%	79,41%	97,85%	-

Figure 5 shows the correlations between the desired interest rate of each of the Eurolanders and the decided interest rate for the Eurosystem, and Figure 6 shows each country's

[10] Λ and Ω are (11×11) matrices in the case of the initial Euroland and (15×15) matrices the case of the enlarged Euroland.

percentage of median voter in the voting procedures.

Figure 6: Median voters in the initial Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	ECB
						(λ=0.2γ=0.5)						
ecb	2,54%	2,28%	2,64%	2,50%	2,46%	2,82%	0,84%	2,66%	2,14%	1,36%	2,74%	75,02%
nat	4,95%	5,29%	12,98%	5,72%	5,72%	9,51%	1,64%	7,59%	32,38%	1,97%	12,25%	-
						(λ=1.0γ=0.5)						
ecb	2,04%	1,90%	2,16%	1,56%	1,70%	1,90%	1,30%	2,20%	1,64%	1,70%	2,06%	79,84%
nat	3,49%	5,67%	11,98%	4,91%	5,02%	6,65%	2,26%	6,71%	33,84%	2,75%	16,72%	-
						(λ=1.0γ=0.25)						
ecb	1,42%	1,24%	1,12%	1,58%	1,46%	1,40%	1,12%	1,66%	1,60%	1,38%	1,82%	84,20%
nat	3,47%	5,01%	11,92%	5,97%	5,99%	5,90%	1,94%	6,33%	34,60%	2,86%	16,01%	-
						(λ=5.0γ=0.5)						
ecb	1,02%	1,24%	1,06%	1,10%	1,38%	1,54%	1,40%	1,30%	1,68%	1,38%	1,46%	85,44%
nat	3,05%	5,85%	12,24%	5,12%	5,46%	5,55%	2,60%	5,68%	33,08%	3,16%	18,22%	-
						(λ=1.0γ=1.0)						
ecb	2,28%	2,44%	1,84%	1,94%	2,14%	2,04%	1,70%	2,28%	1,92%	2,24%	2,06%	77,12%
nat	3,66%	5,60%	12,40%	4,31%	4,89%	6,61%	1,53%	6,69%	33,64%	2,47%	18,21%	-
						(λ=1.0γ=5.0)						
ecb	3,60%	3,14%	3,40%	2,94%	3,26%	3,18%	1,80%	2,94%	1,90%	3,18%	2,24%	68,42%
nat	3,90%	4,67%	13,86%	3,02%	4,09%	9,11%	1,03%	7,83%	29,77%	2,27%	20,45%	-

The ECB's desired interest rate is quite often accepted by the EMU countries. The ECB-Board is by and large the most frequent median voter (Figure 6) and its desired interest rate is very highly correlated with the interest rate yielded by the voting procedure (Figure 5). In this way, it seems that the ECB-Board dominates the decision-making process in the Eurosystem.

When going from the ECB rule to the Nationalistic rule, larger countries (except for the Netherlands and Spain) lose relatively more of their importance (compared to smaller countries) because they generally have a higher weight in the former (based on GDP and population) than on the latter rule (at most $\frac{2}{17} = 0.1176$)[11]. Therefore, their correlations with the decided interest rate decrease. When all members vote taking a nationalistic viewpoint, the Netherlands's and Spain's desired interest rates very much track the finally decided one (they have a high correlation with the decided interest rate in Figure 5). This is also translated into often being the median voter. We can say that these countries gain from being in the core of the European economy, in the sense that the median voter reflects the place taken by each economy in the Euroland's average. From Figure 6 we see that Finland takes the third place in the median voters with the Nationalistic rule, fact that is reflected in its relatively high correlation with the decided interest rate in Figure 5. Ireland and Luxembourg also have a high correlation, although a median voter percentage much inferior to the Netherlands, Spain or Finland.

Looking across the Central Banks' preferences in Figure 5, it seems that correlations depend on the preferences of the monetary authorities: the more they desire to stabilize

[11] See Table 4 in the Appendix.

output (preferences (1, 5, 0.5)) and the more they disregard the stabilization of interest rates (preferences (1, 1, 0.25)), the lower the correlations between the countries' desired interest rates and the decided interest rate for Euroland. This is because aiming at stabilizing output accentuates the structural differences between the different countries due to the asymmetric propagation mechanisms and (country-specific) output shocks. This also happens when the weight put on interest rates is lower because common features (past interest rates) are taken relatively less importantly than more country-specific ones (inflation and output). When countries put a higher preference on stabilizing output, the ECB is more often the median voter. This is due to the fact that a higher desire to stabilize output leads to more national divergence of desires about the interest rate. This strengthens the hand of the ECB-Board.

4.2.2 After enlargement

In this section we simulate an enlarged Euroland consisting of the 15 EU countries. In order to assess the relative power of the members in the different voting schemes, we must first define the status of the entering countries within the Eurosystem.

Figure 7: Correlations between desired and decided interest rates in the enlarged Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK	ECB
								(λ= 0.2,ν= 0.5)								
ems	95,19%	94,04%	92,45%	93,07%	100,00%	96,44%	44,33%	95,96%	96,54%	75,01%	95,65%	94,09%	48,52%	86,59%	91,87%	58,25%
ecb	86,23%	82,53%	77,26%	82,79%	83,71%	96,07%	65,41%	85,76%	96,37%	48,69%	92,53%	80,30%	46,51%	59,94%	78,47%	99,59%
nat	81,40%	77,60%	72,56%	78,20%	66,66%	96,56%	39,48%	79,75%	97,33%	45,18%	92,28%	74,62%	38,90%	48,87%	70,12%	-
								(λ= 1, ν= 0.5)								
ems	80,01%	77,51%	76,92%	69,78%	100,00%	90,21%	10,94%	86,93%	90,79%	72,50%	89,91%	66,38%	58,51%	58,00%	81,46%	70,62%
ecb	57,42%	51,33%	56,41%	56,82%	77,25%	87,47%	48,98%	62,46%	90,60%	50,61%	86,54%	40,84%	38,64%	44,27%	66,91%	99,22%
nat	54,66%	51,02%	57,10%	55,81%	47,11%	87,49%	26,31%	54,50%	93,29%	51,42%	87,93%	40,19%	40,54%	30,95%	61,39%	-
								(λ= 1, ν= 0.25)								
ems	69,01%	58,41%	64,27%	50,43%	100,00%	86,91%	-4,93%	78,18%	87,60%	63,96%	86,44%	34,37%	53,10%	37,19%	70,69%	69,55%
ecb	49,36%	39,65%	44,95%	49,32%	73,44%	81,61%	45,64%	49,23%	86,19%	43,14%	81,30%	21,01%	40,37%	39,38%	55,35%	99,16%
nat	51,72%	45,26%	50,53%	44,05%	43,32%	80,16%	22,62%	45,17%	89,25%	43,70%	82,36%	23,02%	42,42%	32,65%	49,83%	-
								(λ= 5.0,ν= 0.5)								
ems	47,29%	24,83%	44,51%	18,04%	100,00%	78,27%	-9,84%	62,10%	80,04%	53,53%	78,46%	0,56%	62,60%	21,50%	53,06%	70,46%
ecb	36,50%	22,25%	36,88%	39,81%	68,79%	65,92%	43,10%	38,29%	76,25%	32,62%	73,63%	9,54%	40,35%	34,39%	46,59%	98,57%
nat	38,48%	27,32%	41,77%	38,38%	33,45%	60,59%	21,00%	34,03%	80,57%	37,01%	76,05%	16,43%	43,41%	28,95%	47,94%	-
								(λ= 1.0,ν= 1.0)								
ems	89,34%	87,50%	86,78%	82,79%	100,00%	93,79%	33,80%	92,71%	94,05%	84,29%	93,67%	84,43%	67,31%	72,72%	90,37%	71,52%
ecb	66,56%	63,81%	64,28%	66,48%	80,53%	91,46%	55,13%	72,33%	93,31%	58,81%	90,99%	53,31%	39,73%	47,10%	74,21%	99,33%
nat	59,70%	58,22%	61,99%	63,76%	48,63%	91,64%	32,22%	60,70%	95,28%	53,28%	91,78%	43,92%	41,52%	31,84%	64,15%	-
								(λ= 1.0,ν= 5.0)								
ems	97,24%	96,55%	96,41%	95,15%	100,00%	97,73%	84,27%	97,87%	97,79%	94,16%	97,74%	96,40%	85,25%	93,65%	97,25%	67,97%
ecb	91,00%	88,03%	86,98%	84,63%	87,69%	97,61%	73,61%	93,09%	97,94%	79,98%	97,68%	86,15%	67,88%	72,83%	93,26%	99,65%
nat	86,45%	83,45%	81,54%	77,67%	68,26%	98,37%	57,17%	88,30%	98,92%	74,79%	98,42%	80,33%	68,58%	59,72%	89,56%	-

The statutes of the ECB state that the Executive Board is composed of six members: the President, the Vice-President and four Directors. Unless there is a change in the Treaty, this body will not experience any change in terms of number of members. What can happen, in turn, is a change in the composition of the Board.

The United Kingdom is very reluctant in what concerns handing over its monetary policy to the ECB. Therefore, it seems quite plausible, we argue, that the UK would substitute one of the current members of the Executive Board, assuring it a relatively higher control on the monetary policy that would come into force in the Euro-zone.

Taking into consideration that Finland is the smallest country with a national as a member of the Board, in this paper we consider that the UK substitutes Finland in the Executive Board when the statutes of the ECB are not altered by the enlargement of Euroland. In terms of our framework, this means that the UK will vote for the EMU average desired interest rate in the ECB rule (instead of Finland) and that there will be a transfer of powers from Finland to the UK in the Nationalistic rule due to different weighting.

Figures 7 and 8 show the correlations between the desired and the decided interest rates, and the median voters' percentages, respectively, for the case of the enlarged Euroland.

Figure 8: Median voters in the enlarged Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK	ECB
								(λ=0.2,γ=0.5)								
ecb	1,92%	1,76%	1,38%	1,96%	1,26%	2,66%	0,64%	1,82%	2,78%	0,64%	3,28%	1,62%	0,32%	1,44%	2,16%	74,36%
nat	4,66%	5,00%	2,96%	9,04%	5,42%	11,02%	2,78%	4,80%	26,52%	1,32%	11,66%	5,12%	0,76%	1,90%	7,04%	-
								(λ=1.0,γ=0.5)								
ecb	1,36%	1,32%	1,00%	1,40%	0,76%	2,24%	0,70%	1,72%	2,52%	0,74%	3,38%	1,26%	0,42%	0,96%	1,72%	78,50%
nat	3,06%	3,56%	2,46%	7,54%	5,44%	9,58%	4,00%	3,28%	27,54%	2,06%	16,30%	3,84%	0,96%	2,20%	8,18%	-
								(λ=1.0,γ=0.25)								
ecb	1,00%	1,16%	0,66%	1,38%	0,66%	2,90%	0,76%	1,34%	2,14%	0,84%	2,62%	1,02%	0,52%	0,96%	1,70%	80,34%
nat	2,82%	3,94%	2,24%	8,18%	5,04%	9,12%	3,96%	3,30%	26,06%	2,10%	16,72%	4,00%	1,60%	2,16%	8,76%	-
								(λ=5.0,γ=0.5)								
ecb	0,68%	1,30%	0,82%	1,52%	0,54%	2,22%	0,86%	0,86%	2,24%	0,64%	2,78%	1,06%	0,94%	0,94%	1,66%	80,94%
nat	2,40%	4,10%	2,24%	7,96%	4,78%	8,48%	4,36%	3,06%	23,14%	2,66%	17,90%	3,86%	2,80%	2,38%	9,88%	-
								(λ=1.0,γ=1.0)								
ecb	1,38%	1,34%	1,30%	1,40%	0,80%	2,98%	0,82%	1,74%	2,76%	1,14%	3,20%	1,72%	0,72%	1,10%	2,04%	75,56%
nat	3,24%	3,70%	2,72%	8,22%	4,14%	10,38%	3,24%	4,02%	26,40%	2,04%	16,36%	3,62%	1,12%	2,16%	8,64%	-
								(λ=1.0,γ=5.0)								
ecb	2,32%	2,20%	1,66%	2,28%	1,06%	3,20%	0,84%	2,54%	2,78%	1,08%	3,68%	2,44%	0,86%	1,52%	2,84%	68,70%
nat	2,92%	3,72%	2,62%	5,24%	3,18%	10,16%	2,60%	4,10%	26,90%	1,78%	20,24%	2,78%	0,82%	2,02%	10,92%	-

The correlation between the desired interest rate of the ECB and the actually decided interest rate declines when we enlarge the Euroland to the whole of the EU member countries (see Figure 7). This decline arises from the diversity of the economies. Nevertheless, the Board preserves a high correlation with the decided interest rate and it is still the most frequent median voter.

Comparing Figures 5 and 7 we can see that, with the 15 countries, Ireland becomes more synchronized with the decided interest rate and Finland (and Luxembourg) lose ground when voting taking a nationalistic viewpoint. It follows that the percentage of median voter for Ireland rises and Finland's (and Luxembourg's) decrease when the four countries are included (compare Figures 6 and 8). The Netherlands and Spain remain prominent, both in terms of correlations with the decided interest rate and in terms of median voters.

In conclusion, the addition of the four outsiders does not reduce significantly the strate-

gic position of the ECB-Board in the decision-making process. This is probably due to the fact that the asymmetric structure of the shocks does not alter significantly in the enlarged EMU. As a result, the ECB-Board maintains its central position in the decision-making process.

4.3 Welfare analysis

In the welfare analysis, we evaluate the extent to which the different decision rules affect the effectiveness of the system in stabilizing inflation, output and the interest rate. Both the initial and the enlarged Euroland are considered.

Figure 9: Relative losses in the initial Euroland

						(λ=0.2, v=0.5)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
BEN/EMS	97%	88%	94%	90%	100%	95%	51%	95%	95%	83%	94%
BEN/ECB	99%	95%	97%	94%	98%	99%	76%	98%	99%	85%	97%
BEN/NAT	99%	97%	98%	94%	97%	100%	65%	99%	100%	85%	97%
EMS/ECB	102%	109%	104%	104%	98%	104%	149%	104%	104%	102%	102%
EMS/NAT	102%	111%	105%	104%	97%	105%	127%	104%	105%	102%	103%
ECB/NAT	100%	102%	101%	100%	99%	101%	85%	101%	101%	100%	101%
						(λ=1.0, v=0.5)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
BEN/EMS	94%	77%	92%	87%	100%	92%	46%	91%	92%	90%	94%
BEN/ECB	98%	93%	98%	95%	95%	98%	74%	97%	98%	93%	98%
BEN/NAT	99%	96%	100%	95%	93%	100%	71%	99%	100%	94%	99%
EMS/ECB	104%	120%	106%	108%	95%	106%	160%	106%	107%	104%	104%
EMS/NAT	105%	124%	108%	108%	93%	108%	153%	109%	109%	104%	105%
ECB/NAT	101%	103%	102%	100%	98%	102%	95%	102%	102%	100%	101%
						(λ=1.0, v=0.25)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
BEN/EMS	93%	72%	90%	87%	100%	92%	44%	90%	92%	86%	94%
BEN/ECB	96%	89%	96%	95%	93%	97%	75%	97%	98%	89%	98%
BEN/NAT	97%	94%	98%	95%	89%	99%	70%	98%	100%	89%	99%
EMS/ECB	104%	124%	107%	110%	93%	106%	170%	107%	106%	103%	104%
EMS/NAT	105%	130%	109%	109%	89%	107%	157%	108%	108%	103%	105%
ECB/NAT	101%	105%	102%	99%	96%	101%	93%	101%	102%	100%	101%
						(λ=5.0, v=0.5)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
BEN/EMS	91%	64%	87%	80%	100%	91%	42%	89%	90%	89%	94%
BEN/ECB	95%	83%	94%	91%	93%	96%	73%	95%	97%	93%	98%
BEN/NAT	96%	90%	97%	89%	89%	98%	67%	97%	99%	94%	99%
EMS/ECB	105%	129%	108%	114%	93%	105%	176%	107%	108%	104%	104%
EMS/NAT	106%	140%	110%	111%	89%	107%	162%	109%	110%	105%	106%
ECB/NAT	101%	108%	103%	98%	96%	101%	92%	102%	102%	101%	101%
						(λ=1.0, v=1.0)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
BEN/EMS	96%	80%	91%	88%	100%	93%	53%	94%	92%	92%	95%
BEN/ECB	99%	93%	97%	94%	96%	98%	79%	98%	98%	95%	98%
BEN/NAT	99%	96%	99%	93%	95%	100%	74%	99%	100%	95%	99%
EMS/ECB	103%	116%	106%	107%	96%	105%	148%	104%	107%	104%	104%
EMS/NAT	103%	120%	108%	106%	95%	107%	138%	106%	109%	104%	105%
ECB/NAT	101%	104%	102%	99%	98%	101%	93%	101%	102%	101%	101%
						(λ=1.0, v=5.0)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
BEN/EMS	97%	88%	96%	94%	100%	95%	72%	96%	94%	96%	97%
BEN/ECB	100%	97%	99%	98%	98%	99%	87%	99%	99%	98%	99%
BEN/NAT	100%	99%	100%	97%	97%	100%	83%	100%	100%	99%	100%
EMS/ECB	102%	110%	104%	105%	98%	104%	121%	104%	105%	103%	102%
EMS/NAT	103%	112%	104%	104%	97%	105%	115%	104%	106%	103%	103%
ECB/NAT	100%	102%	101%	99%	99%	101%	95%	101%	101%	100%	101%

4.3.1 The initial Euroland

Figure 9[12] shows the relative losses of the different simulation scenarios for the initial Euroland.

First, we compare the situation of the initial 11 members before and after EMU. Before EMU was launched, the system was based on the Exchange Rate Mechanism, where currencies fluctuated within a margin around their central parity. Countries had their interest rate following Germany's interest rate very closely. This is the case of the EMS rule. A look at the relative losses in Figure 9 (4^{th} and 5^{th} rows in each preference set) suggests that countries gain in welfare terms when the EMU is launched. All countries prefer the ECB rule - and the Nationalistic rule - compared to the EMS rule, except for Germany itself. Losses are higher when Germany's desired interest rate comes into force in the whole Euro-zone. This welfare gain from joining the EMU is higher when there is a higher preference attached to the stabilization of output. In this case, adopting Germany's interest rate is costlier for the other countries for the same reasons as given in section 4.2.1.

Secondly, once in the EMU system the following question emerges: are there incentives for the members of the Executive Board to look at the Euro-zone as a whole when deciding about the interest rate? Such incentives are not evident from our results stated in the last row of each preference set in Figure 9. Indeed, most countries seem to prefer the Nationalistic rule to the ECB rule and the higher the preference for stabilizing output (preferences (1, 5, 0.5)) the more the members of the ECB-Board seem to have an incentive to take a nationalistic point of view in the voting procedure. In any case, these preferences are not very pronounced and the differences in losses between the two rules are small and do not allow a clear answer to the question. The results for France, Germany and Italy in preferring the ECB rule are in tune with the fact that these countries are the ones who win the most in voting power when going from one "regime" (Nationalistic rule) to the other (ECB rule)[13].

4.3.2 In the enlarged Euroland

How do these losses change when we make Denmark, Greece, Sweden and the UK part of the Euro-zone? Figure 10 shows the relative losses for the enlarged Euroland.

We compare EMU with EMS for Denmark, Greece and Sweden. For the UK, we compare the entering to the EMU with the case where it undertakes an independent monetary policy.

The ECB and the Nationalistic rules yield welfare gains for all newcomers, compared to the EMS system. That is, Denmark, Greece and Sweden are better off in the EMU than following the EMS rule. The relative difference between losses with the ECB rule and the EMS rule widens, as before, when Central Banks put relatively more weight in output.

[12] *BEN* refers to the losses in the benchmark case (monetary independence) where countries minimize their loss functions individually; *EMS* refers to the losses when Germany's interest rate comes into force in the whole Euro-zone; *ECB* refers to the ECB rule, and *NAT* to the nationalistic rule.

[13] See Table 4 in the Appendix.

Comparing the ECB and Nationalistic rules to the Benchmark rule, we conclude that conducting an independent monetary policy yields lower losses. The UK, therefore, seems to have a point when it looks at the EMU with little trust. It should be said, though, that other conclusions were not to be expected since, by definition, in the Benchmark rule (the case of monetary independence) countries apply the interest rate that is the outcome of their optimization problem. Nevertheless, the benefits from a Monetary Union are not completely captured by the loss function that the Central Bank has to minimize. Moreover, welfare losses under the ECB or the Nationalistic rules do not show great discrepancies comparing with losses under the Benchmark rule, further tending to decrease - that is, the UK gets more indifferent towards the EMU - the higher is the Central Bank's preference in smoothing interest rates.

Figure 10: Relative losses in the enlarged Euroland

								(λ=0.2y=0.5)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
BEN/EMS	97%	92%	98%	82%	100%	79%	44%	98%	95%	85%	94%	86%	52%	84%	82%
BEN/ECB	100%	98%	99%	94%	97%	96%	73%	99%	99%	87%	97%	98%	53%	91%	91%
BEN/NAT	100%	98%	99%	95%	96%	98%	66%	99%	100%	87%	98%	99%	53%	92%	91%
EMS/ECB	103%	107%	101%	114%	97%	121%	167%	101%	105%	101%	103%	114%	102%	108%	111%
EMS/NAT	103%	107%	101%	115%	96%	124%	150%	101%	105%	102%	104%	115%	102%	109%	111%
ECB/NAT	100%	101%	100%	101%	99%	102%	90%	100%	100%	100%	100%	101%	100%	100%	100%
								(λ=1.0y=0.5)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
BEN/EMS	95%	87%	97%	71%	100%	61%	50%	96%	93%	88%	93%	81%	62%	74%	76%
BEN/ECB	98%	97%	99%	92%	96%	92%	79%	98%	99%	91%	98%	95%	63%	87%	93%
BEN/NAT	98%	98%	99%	93%	94%	95%	75%	98%	100%	91%	98%	96%	63%	87%	94%
EMS/ECB	104%	112%	102%	130%	96%	150%	157%	102%	107%	103%	105%	118%	102%	118%	123%
EMS/NAT	104%	112%	102%	131%	94%	155%	149%	102%	108%	103%	106%	119%	102%	117%	124%
ECB/NAT	100%	101%	100%	101%	98%	104%	95%	100%	100%	100%	100%	101%	100%	99%	101%
								(λ=1.0y=0.25)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
BEN/EMS	94%	86%	95%	69%	100%	61%	41%	95%	93%	86%	93%	77%	68%	66%	70%
BEN/ECB	97%	96%	97%	90%	96%	91%	75%	97%	99%	88%	99%	94%	70%	84%	89%
BEN/NAT	98%	97%	97%	90%	94%	94%	70%	97%	100%	88%	99%	96%	70%	83%	90%
EMS/ECB	104%	111%	102%	129%	96%	149%	183%	102%	107%	102%	106%	123%	103%	126%	128%
EMS/NAT	104%	113%	102%	130%	94%	154%	170%	102%	108%	103%	106%	125%	104%	125%	129%
ECB/NAT	101%	101%	100%	101%	98%	103%	93%	100%	101%	100%	100%	102%	100%	100%	101%
								(λ=5.0y=0.5)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
BEN/EMS	90%	80%	94%	59%	100%	54%	40%	95%	92%	88%	93%	73%	75%	56%	66%
BEN/ECB	95%	93%	96%	87%	94%	90%	79%	98%	99%	92%	99%	96%	79%	73%	90%
BEN/NAT	95%	94%	97%	89%	91%	94%	76%	98%	99%	92%	100%	96%	80%	72%	92%
EMS/ECB	105%	116%	103%	147%	94%	165%	196%	103%	108%	104%	107%	131%	106%	129%	137%
EMS/NAT	105%	117%	103%	150%	91%	173%	187%	103%	109%	104%	107%	132%	107%	128%	139%
ECB/NAT	100%	101%	100%	102%	97%	104%	95%	100%	101%	100%	100%	101%	101%	99%	101%
								(λ=1.0y=1.0)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
BEN/EMS	96%	89%	97%	69%	100%	64%	53%	98%	93%	92%	94%	84%	73%	78%	79%
BEN/ECB	98%	97%	98%	92%	94%	94%	84%	99%	99%	94%	99%	97%	76%	89%	94%
BEN/NAT	98%	98%	98%	94%	92%	97%	81%	99%	100%	94%	99%	98%	76%	89%	95%
EMS/ECB	103%	109%	101%	133%	94%	146%	159%	102%	107%	103%	105%	115%	104%	115%	120%
EMS/NAT	103%	110%	101%	135%	92%	151%	153%	102%	107%	103%	106%	116%	105%	114%	120%
ECB/NAT	100%	101%	100%	102%	98%	103%	96%	100%	101%	100%	100%	101%	100%	100%	100%
								(λ=1.0y=5.0)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
BEN/EMS	98%	92%	98%	80%	100%	72%	75%	98%	95%	94%	96%	91%	72%	88%	85%
BEN/ECB	100%	98%	99%	94%	97%	97%	93%	100%	100%	96%	100%	99%	74%	95%	98%
BEN/NAT	100%	99%	99%	94%	96%	99%	91%	100%	100%	96%	100%	99%	74%	95%	99%
EMS/ECB	102%	107%	101%	118%	97%	134%	123%	102%	105%	102%	104%	109%	102%	108%	115%
EMS/NAT	102%	107%	101%	118%	96%	137%	121%	102%	106%	102%	104%	109%	102%	108%	116%
ECB/NAT	100%	101%	100%	100%	99%	103%	98%	100%	100%	100%	100%	100%	100%	100%	101%

We now take a deeper look at the welfare consequences of enlargement of the Euroland by focusing on the absolute losses[14]. The latter are not affected much when the four additional countries adopt the Euro. Nevertheless, some countries gain and others lose by the enlargement, i.e., Austria, France, Germany, Ireland, Italy, the Netherlands and Spain have lower losses and Belgium, Finland, Luxembourg and Portugal suffer an increase. The countries that experiment a bigger change in their losses when going towards an enlarged Euroland are Finland (higher), and France and Ireland (lower). It seems that the direction of the changes in the absolute losses is connected with the relative changes in power. And so, Finland gets less importance in the voting procedure (as pointed out in section 4.2.2) which causes a higher welfare loss. Conversely, Ireland has more of a say in the voting procedure, fact that confers it a lower loss.

On the whole, it appears that enlargement leads to welfare gains in a majority of the initial members of the EMU.

4.4 Is there a need for increasing the size of the Executive Board?

In spite of the conclusion in section 4.2.2 that the addition of the four outsiders does not reduce significantly the strategic position of the ECB-Board in the decision-making process, we find it important to approach the question of reforming the ECB aiming at a better coping with enlargements of the EMU. In this section, we consider the possibility of changing the statutes of the ECB in order to enlarge the Executive Board when enlarging the Euroland. We consider here that when the four additional countries enter the EMU the ECB appoints a new member - a national of the UK - for its Executive Board, maintaining the ones that are currently part of it.

An immediate consequence of this would be to subject the voting of the decision-making bodies to the problem of even numbers in the determination of the median voter, since there would be 15 NCBs and 7 members of the Executive Board, adding up to 22 seats at the Governing Council. To overcome this problem, we assume that the Executive Board wins the voting if its proposal has at least half of the votes, inclusive. That is, if a tie occurs, the President settles the result of the voting to the interest rate voted by the Board. In terms of the simulations, this means that the proposal of the President will become the decided interest rate if the Executive Board and at least four members of the Governing Council will vote in favor of it. In fact, even if there are 11 countries at the opposite side of the desire of the Executive Board, it will pass as the winner. It turns out that the result from taking the median voter (taken to be the 11^{th} country in sorting) does not always yield exactly the same as when having the whole procedure of majority voting. In accounting for voting outcomes, we take the latter to be the relevant one.

This description casts a light on the broader problem of reforming the ECB - and the European institutions in general - in preparing for enlargements towards Central and Eastern Europe[15]. Indeed, maintaining the size of the Executive Board when enlarging

[14] For the values, see Figures 14-25 in the Appendix.

[15] For an analysis of the distribution of voting power within the ECB as the EMU gets larger, see Baldwin,

Euroland to embody just four additional countries decreases the weight of the ECB (in terms of votes) in the decision-making process from 35% ($\frac{6}{17} = 0.35$) to 29% ($\frac{6}{21} = 0.29$). When considering the entering of the CEEC, the influence of the ECB, if it is to remain with the same structure as today, will decrease even more. The voting procedure might get quite distressed and issues on Euroland's due representation will easily arise.

Figure 11: Correlations between desired and decided interest rates in an enlarged Executive Board

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK	ECB
								(λ=0.2,γ=0.5)								
ems	94.83%	93.67%	92.26%	92.18%	100.00%	96.50%	40.05%	96.12%	96.61%	73.93%	95.63%	93.72%	47.30%	84.88%	91.40%	51.98%
ecb	85.47%	81.86%	76.65%	82.27%	82.65%	96.00%	68.92%	86.38%	96.24%	55.66%	92.74%	80.88%	45.78%	60.34%	80.87%	99.92%
nat	83.29%	79.33%	78.34%	76.83%	62.24%	96.85%	48.10%	81.91%	97.41%	52.07%	92.38%	75.45%	40.67%	48.48%	70.44%	-
								(λ=1,γ=0.5)								
ems	79.01%	75.21%	75.72%	70.03%	100.00%	90.46%	11.31%	86.41%	90.96%	72.83%	90.03%	64.59%	62.34%	56.04%	81.92%	72.12%
ecb	52.86%	48.17%	48.61%	56.57%	80.16%	87.11%	50.78%	60.59%	90.04%	46.17%	86.39%	37.67%	40.11%	46.32%	64.20%	99.81%
nat	57.13%	49.85%	63.18%	48.16%	46.71%	86.80%	21.21%	54.58%	92.49%	46.55%	87.64%	40.84%	39.76%	32.60%	60.72%	-
								(λ=1,γ=0.25)								
ems	70.76%	61.04%	66.39%	47.78%	100.00%	87.29%	-6.33%	77.34%	88.19%	59.68%	87.11%	33.54%	50.56%	34.88%	70.57%	69.90%
ecb	48.58%	38.69%	45.03%	51.80%	74.78%	81.42%	47.85%	49.20%	86.14%	34.29%	82.30%	19.34%	35.74%	36.78%	57.77%	99.80%
nat	55.24%	44.15%	58.45%	48.43%	41.02%	79.14%	22.37%	44.74%	88.69%	34.03%	82.17%	22.90%	40.83%	26.81%	53.08%	-
								(λ=5.0,γ=0.5)								
ems	50.42%	29.82%	48.94%	17.44%	100.00%	77.83%	-14.95%	63.44%	79.93%	56.60%	78.12%	-1.96%	65.23%	25.36%	48.56%	72.34%
ecb	37.48%	24.96%	37.03%	40.71%	72.45%	64.65%	38.58%	40.55%	74.71%	33.90%	70.76%	7.90%	43.39%	38.39%	42.75%	99.80%
nat	48.41%	31.52%	54.72%	33.74%	33.70%	62.40%	14.59%	36.83%	81.00%	35.97%	72.84%	18.52%	47.33%	28.99%	42.77%	-
								(λ=1.0,γ=1.0)								
ems	88.03%	86.50%	85.12%	81.21%	100.00%	93.07%	32.86%	91.71%	93.31%	82.44%	92.91%	83.86%	61.52%	70.39%	89.13%	68.51%
ecb	69.21%	68.20%	63.93%	67.80%	81.05%	91.78%	58.70%	72.80%	93.13%	56.69%	91.58%	53.72%	39.82%	49.87%	77.31%	99.84%
nat	67.43%	66.92%	70.42%	66.19%	47.89%	93.12%	32.79%	65.65%	95.68%	53.30%	93.57%	48.66%	45.54%	37.72%	69.95%	-
								(λ=1,0,γ=5.0)								
ems	96.33%	95.85%	95.66%	94.31%	100.00%	97.28%	79.04%	97.26%	97.35%	92.12%	97.25%	95.60%	81.74%	91.46%	96.33%	66.84%
ecb	88.17%	86.92%	85.67%	84.70%	88.34%	97.11%	72.76%	91.92%	97.44%	70.33%	97.08%	83.47%	56.07%	65.41%	91.33%	99.85%
nat	84.33%	81.40%	84.35%	74.09%	66.23%	98.10%	47.06%	86.97%	98.69%	66.93%	97.94%	78.33%	57.17%	52.14%	86.76%	-

Not surprisingly, when the ECB-Board is enlarged in our model it is more often the median voter than when it is not enlarged (see Figures 11 and 12). It is surprising, however, to find that the enlarged ECB-Board in the enlarged EMU (in which case it controls 33% of the votes) is more often the median voter than the smaller ECB-Board in the smaller EMU of 11 members (when it controls 35% of the votes). It seems that the phenomenon of the even number of votes (even number of members of the Governing Council) gives a preponderant vote to the President, thereby reinforcing the strategic position of the Board. Further research will be necessary, though, to substantiate this interpretation.

We can conclude that the enlargement of the Board considered here is small and will not produce significant changes in monetary policy procedures. Therefore, the decision-making process does not suffer a large change.

5 Conclusions

In this paper we analysed the effects of the enlargement of the EMU from 11 to 15 members. Our main results can be summarized as follows.

Berglöf, Giavazzi and Widgrén (2000)

Figure 12: Median voters in an enlarged Executive Board

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK	ECB
								(λ=0.2γ=0.5)								
ecb	1.20%	0.94%	0.92%	1.14%	0.70%	1.78%	0.28%	1.04%	1.58%	0.30%	1.66%	1.16%	0.22%	0.80%	0.96%	85.32%
nat	4.82%	4.68%	5.98%	9.10%	5.24%	11.02%	3.32%	4.68%	25.78%	1.24%	9.82%	4.18%	0.60%	2.36%	7.18%	-
								(λ=1.0γ=0.5)								
ecb	0.86%	0.92%	0.56%	0.98%	0.56%	2.06%	0.84%	0.88%	1.74%	0.44%	1.52%	1.02%	0.38%	0.84%	1.10%	85.30%
nat	2.82%	3.98%	5.10%	7.26%	4.72%	8.80%	3.56%	3.46%	25.52%	1.94%	17.36%	3.54%	1.24%	2.70%	8.00%	-
								(λ=1.0γ=0.25)								
ecb	0.68%	0.90%	0.48%	1.22%	0.42%	1.36%	0.68%	0.76%	1.62%	0.46%	1.70%	0.58%	0.32%	0.52%	1.06%	87.24%
nat	2.44%	4.24%	4.44%	7.52%	5.16%	8.78%	3.90%	3.30%	26.20%	2.06%	15.40%	4.32%	1.60%	2.06%	8.58%	-
								(λ=5.0γ=0.5)								
ecb	0.48%	0.46%	0.50%	0.82%	0.40%	1.10%	0.56%	0.82%	1.46%	0.50%	1.60%	0.64%	0.80%	0.62%	0.74%	88.50%
nat	2.34%	4.22%	4.00%	7.98%	4.88%	8.18%	4.72%	2.34%	24.42%	2.64%	15.38%	3.62%	3.38%	2.28%	9.62%	-
								(λ=1.0γ=1.0)								
ecb	0.80%	0.98%	0.68%	1.32%	0.60%	1.92%	0.50%	1.04%	1.80%	0.78%	1.94%	1.06%	0.32%	0.84%	1.38%	84.04%
nat	3.24%	4.40%	4.70%	7.66%	4.00%	9.86%	3.32%	3.82%	26.08%	1.86%	16.36%	3.44%	0.82%	2.22%	8.22%	-
								(λ=1.0γ=5.0)								
ecb	1.24%	1.38%	1.32%	1.62%	1.16%	2.82%	0.44%	2.30%	1.92%	0.78%	2.94%	1.52%	0.32%	0.94%	2.12%	77.18%

First, the ECB-Board dominates the decision-making process in the Eurosystem. This strategic position of the Board remains when considering an enlarged Euroland. When the enlargement from 11 to 15 members is accompanied by an enlargement of the Board by just one member, the ECB-Board's position is strengthened as compared to the present situation. The unchallenged position of the ECB-Board has much to do with the fact that when it votes as a whole and taking into consideration the economic conditions in all EMU, it tends to position itself right in the middle of the different desires member countries have concerning the interest rate.

A second result has to do with welfare. We found that those countries like Denmark who pegged their exchange rate to the Euro while outside the EMU gain welfare when coming into the Eurosystem, i.e. manage to better stabilize output, inflation and interest rates in EMU. This is not the case, however, for the UK, which loses welfare in Euroland.

Finally, the welfare of the 11 initial members of Euroland is not much affected by the enlargement, although a majority of member countries experience slight welfare gains.

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6 Appendix

Table 4: **Voting power changes across regimes in the Euroland-11**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa
relative size (%)	51	62	15	182	263	18	161	3	46	41	95

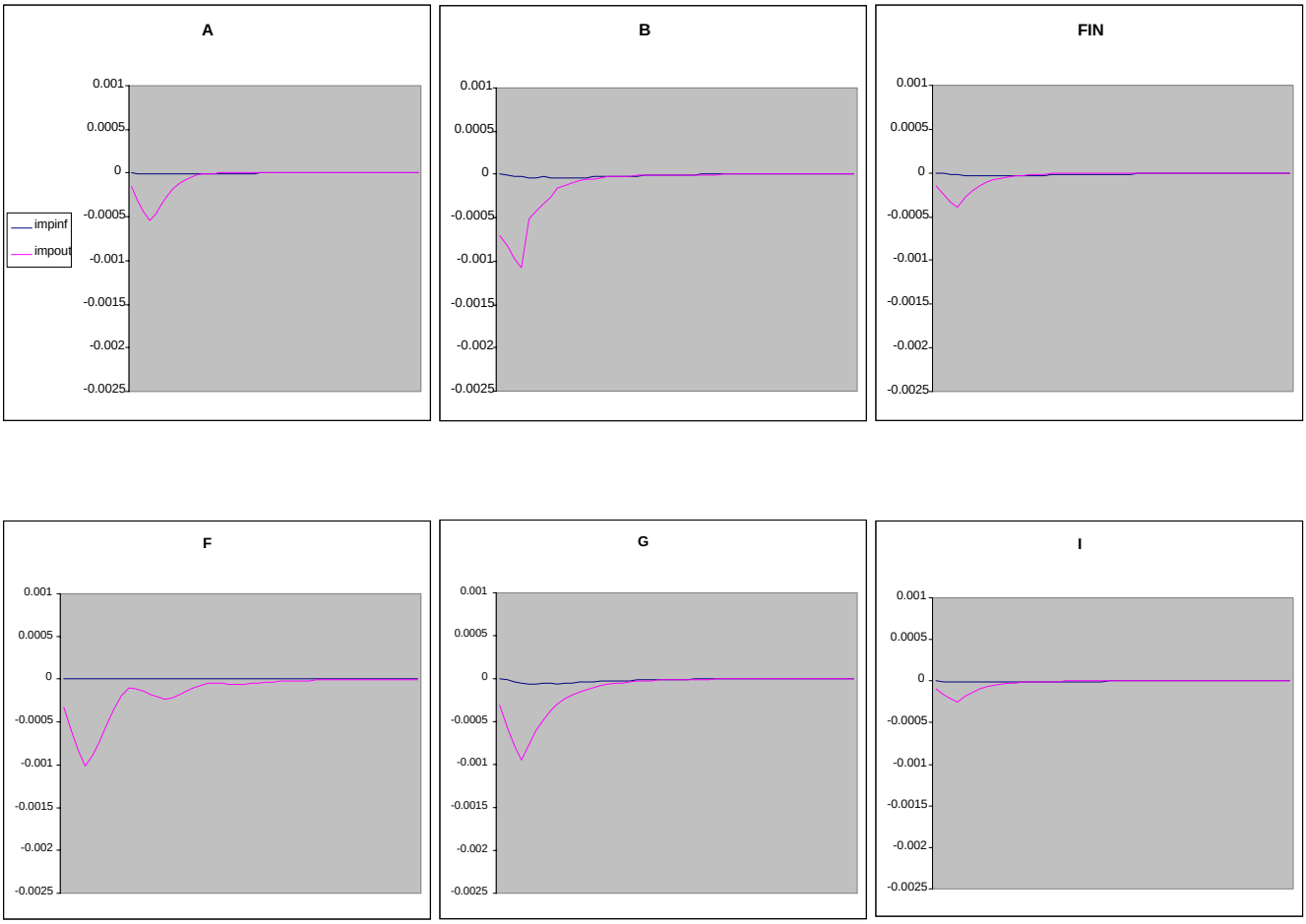
Results obtained by dividing the weights on the ECB rule by the weights on the Nationalistic rule.

Table 5: **Voting power changes across regimes in the Euroland-15**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa	den	gre	swe	uk
relative size (%)	52	64	15	186	269	18	165	3	47	42	97	36	45	58	162

Results obtained by dividing the weights on the ECB rule by the weights on the Nationalistic rule.

Figure 13: Impacts on inflation and output of a 1% increase on the interest rate



(cont.)

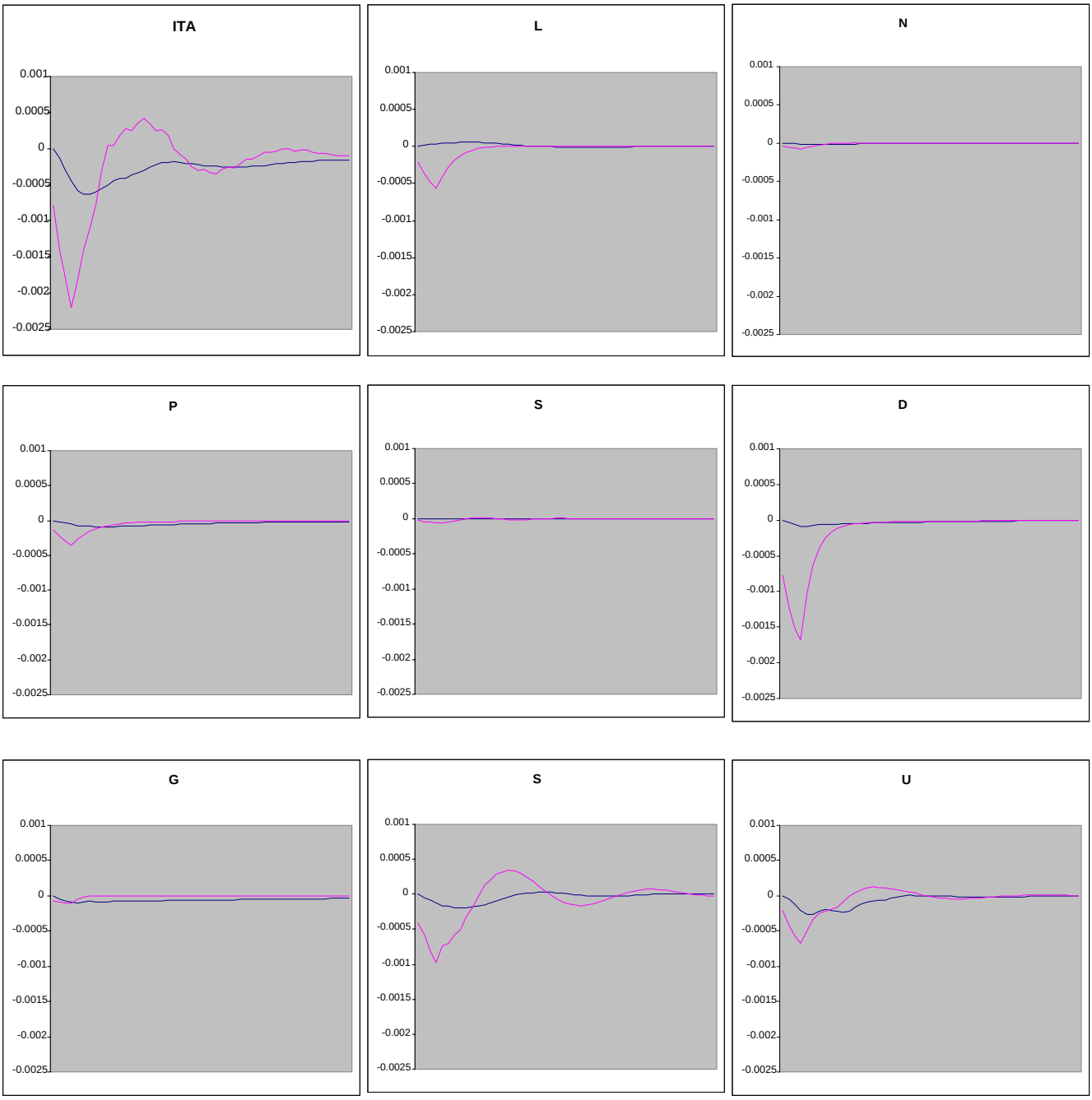


Table 6: **Optimal feedback rule coefficients with preferences (1, 0.2, 0.5)**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa	den	gre	swe	uk
π_t	0.025	0.098	0.073	0.052	0.054	0.018	0.286	-0.010	0.018	0.193	0.051	0.066	0.237	0.132	0.143
π_{t-1}	0.021	0.060	0.027	0.031	0.030	0.015	0.113	0.000	0.012	0.090	0.045	0.055	0.133	0.097	0.058
π_{t-2}	0.015	0.046	0.047	0.028	0.023	0.009	0.129	0.003	0.006	0.056	0.041	0.037	0.177	0.054	0.043
π_{t-3}	0.009	0.025	0.026	0.019	0.020	0.002	0.085	0.006	0.006	-0.001	0.027	0.042	0.080	0.011	0.056
π_{t-4}	-0.002	0.001	-0.001	0.012	0.000	0.002	0.009	0.011	-0.005	0.013	0.011	0.019	0.046	-0.003	0.019
π_{t-5}	-0.003	0.013	-0.001	0.017	0.005	0.006	0.041	0.008	0.000	0.000	0.000	0.011	0.000	0.000	0.033
π_{t-6}	0.000	-0.011	-0.001	0.007	-0.005	0.005	0.059	0.009	0.000	0.000	0.000	0.004	0.000	0.000	0.001
π_{t-7}	0.000	-0.013	-0.011	0.001	-0.006	0.004	0.051	0.006	0.000	0.000	0.000	0.005	0.000	0.000	-0.033
π_{t-8}	0.000	-0.029	-0.006	-0.012	0.008	-0.005	-0.056	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000
π_{t-9}	0.000	-0.015	-0.008	-0.014	0.000	-0.005	0.035	0.002	0.000	0.000	0.000	0.009	0.000	0.000	0.000
π_{t-10}	0.000	-0.021	0.013	-0.002	0.000	-0.004	-0.020	-0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y_t	0.115	0.054	0.073	0.145	0.170	0.052	0.237	0.075	0.011	0.153	0.035	0.080	0.239	0.141	0.221
y_{t-1}	-0.030	0.031	0.000	-0.011	-0.014	0.000	-0.043	-0.008	0.001	0.000	-0.003	0.000	0.000	0.029	-0.084
y_{t-2}	-0.021	0.013	0.000	-0.006	0.000	0.000	-0.023	0.000	-0.001	0.000	-0.001	0.000	0.000	-0.054	-0.001
y_{t-3}	0.000	0.005	0.000	0.004	0.000	0.000	-0.079	0.000	-0.003	0.000	-0.004	0.000	0.000	-0.062	-0.014
y_{t-4}	0.000	-0.004	0.000	-0.012	0.000	0.000	-0.074	0.000	-0.005	0.000	-0.010	0.000	0.000	-0.062	-0.011
y_{t-5}	0.000	0.000	0.000	0.033	0.000	0.000	-0.022	0.000	0.000	0.000	0.013	0.000	0.000	-0.053	-0.054
y_{t-6}	0.000	0.000	0.000	0.056	0.000	0.000	-0.014	0.000	0.000	0.000	0.009	0.000	0.000	-0.044	-0.057
y_{t-7}	0.000	0.000	0.000	0.000	0.000	0.000	-0.037	0.000	0.000	0.000	0.012	0.000	0.000	-0.042	-0.039
y_{t-8}	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
y_{t-9}	0.000	0.000	0.000	0.000	0.000	0.000	-0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.058
y_{t-10}	0.000	0.000	0.000	0.000	0.000	0.000	-0.081	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
i_{t-1}	0.878	0.755	0.887	0.748	0.794	0.952	0.534	0.857	0.993	0.860	0.984	0.673	0.903	0.731	0.789
i_{t-2}	-0.006	-0.013	-0.003	-0.014	-0.015	-0.001	-0.048	-0.005	-0.000	-0.005	-0.000	-0.023	-0.004	-0.017	-0.012
i_{t-3}	-0.003	-0.006	-0.001	-0.006	-0.007	-0.001	-0.023	-0.002	-0.000	-0.002	-0.000	-0.010	-0.002	-0.008	-0.006

Table 7: **Optimal feedback rule coefficients with preferences (1, 1, 0.5)**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa	den	gre	swe	uk
π_t	0.057	0.148	0.085	0.111	0.102	0.030	0.335	0.053	0.021	0.174	0.045	0.125	0.228	0.166	0.165
π_{t-1}	0.048	0.093	0.032	0.064	0.059	0.027	0.133	0.033	0.014	0.084	0.040	0.100	0.127	0.125	0.066
π_{t-2}	0.036	0.071	0.054	0.055	0.045	0.017	0.136	0.035	0.007	0.052	0.037	0.060	0.169	0.071	0.043
π_{t-3}	0.020	0.038	0.030	0.035	0.035	0.003	0.072	0.023	0.007	-0.002	0.024	0.066	0.077	0.013	0.054
π_{t-4}	-0.005	0.008	0.001	0.025	0.001	0.004	-0.009	0.005	-0.006	0.011	0.010	0.028	0.044	-0.004	0.018
π_{t-5}	-0.006	0.030	0.000	0.037	0.009	0.009	0.032	0.006	0.000	0.000	0.000	0.015	0.000	0.000	0.039
π_{t-6}	0.000	-0.002	-0.007	0.019	-0.009	0.008	0.061	-0.013	0.000	0.000	0.000	0.003	0.000	0.000	0.005
π_{t-7}	0.000	-0.006	-0.012	0.006	-0.013	0.007	0.059	-0.014	0.000	0.000	0.000	0.006	0.000	0.000	-0.036
π_{t-8}	0.000	-0.034	-0.007	-0.023	0.014	-0.008	-0.061	-0.003	0.000	0.000	0.000	0.006	0.000	0.000	0.000
π_{t-9}	0.000	-0.018	-0.009	-0.029	0.000	-0.009	0.040	-0.012	0.000	0.000	0.000	0.016	0.000	0.000	0.000
π_{t-10}	0.000	-0.029	0.015	-0.004	0.000	-0.006	-0.022	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y_t	0.370	0.152	0.222	0.413	0.436	0.184	0.481	0.231	0.034	0.297	0.070	0.230	0.238	0.391	0.414
y_{t-1}	-0.090	0.092	0.000	-0.049	-0.035	0.000	-0.060	-0.027	0.002	0.000	-0.014	0.000	0.000	0.133	-0.143
y_{t-2}	-0.066	0.039	0.000	-0.042	0.000	0.000	-0.022	0.000	-0.006	0.000	-0.007	0.000	0.000	-0.093	0.023
y_{t-3}	0.000	0.015	0.000	-0.012	0.000	0.000	-0.152	0.000	-0.011	0.000	-0.009	0.000	0.000	-0.123	-0.012
y_{t-4}	0.000	-0.012	0.000	-0.051	0.000	0.000	-0.147	0.000	-0.016	0.000	-0.016	0.000	0.000	-0.137	-0.016
y_{t-5}	0.000	0.000	0.000	0.089	0.000	0.000	-0.027	0.000	0.000	0.000	0.039	0.000	0.000	-0.124	-0.103
y_{t-6}	0.000	0.000	0.000	0.163	0.000	0.000	-0.005	0.000	0.000	0.000	0.027	0.000	0.000	-0.107	-0.113
y_{t-7}	0.000	0.000	0.000	0.000	0.000	0.000	-0.060	0.000	0.000	0.000	0.028	0.000	0.000	-0.111	-0.078
y_{t-8}	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
y_{t-9}	0.000	0.000	0.000	0.000	0.000	0.000	-0.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.115
y_{t-10}	0.000	0.000	0.000	0.000	0.000	0.000	-0.169	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
i_{t-1}	0.721	0.577	0.786	0.572	0.595	0.859	0.332	0.728	0.972	0.782	0.956	0.450	0.882	0.566	0.666
i_{t-2}	-0.018	-0.039	-0.010	-0.040	-0.037	-0.005	-0.099	-0.016	-0.001	-0.011	-0.001	-0.065	-0.004	-0.042	-0.025
i_{t-3}	-0.008	-0.017	-0.004	-0.018	-0.017	-0.002	-0.048	-0.007	-0.000	-0.005	-0.000	-0.029	-0.002	-0.020	-0.011

Table 8: **Optimal feedback rule coefficients with preferences (1, 1, 0.25)**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa	den	gre	swe	uk
π_t	0.078	0.194	0.121	0.146	0.136	0.045	0.427	0.065	0.039	0.248	0.073	0.169	0.329	0.216	0.230
π_{t-1}	0.066	0.121	0.046	0.083	0.079	0.039	0.176	0.042	0.025	0.119	0.064	0.134	0.183	0.165	0.094
π_{t-2}	0.050	0.091	0.077	0.068	0.060	0.025	0.174	0.045	0.014	0.074	0.059	0.077	0.244	0.095	0.061
π_{t-3}	0.027	0.047	0.042	0.040	0.046	0.005	0.088	0.031	0.012	-0.002	0.038	0.083	0.111	0.016	0.074
π_{t-4}	-0.006	0.010	0.001	0.030	0.001	0.006	-0.015	0.012	-0.011	0.016	0.016	0.035	0.064	-0.005	0.024
π_{t-5}	-0.007	0.040	0.001	0.048	0.012	0.014	0.035	0.013	0.000	0.000	0.000	0.018	0.000	0.000	0.054
π_{t-6}	0.000	0.001	-0.001	0.027	-0.012	0.013	0.074	-0.011	0.000	0.000	0.000	0.002	0.000	0.000	0.007
π_{t-7}	0.000	-0.004	-0.017	0.011	-0.017	0.011	0.074	-0.015	0.000	0.000	0.000	0.006	0.000	0.000	-0.050
π_{t-8}	0.000	-0.040	-0.010	-0.028	0.018	-0.012	-0.076	-0.003	0.000	0.000	0.000	0.006	0.000	0.000	0.000
π_{t-9}	0.000	-0.021	-0.013	-0.037	0.000	-0.012	0.050	-0.015	0.000	0.000	0.000	0.021	0.000	0.000	0.000
π_{t-10}	0.000	-0.037	0.021	-0.005	0.000	-0.009	-0.027	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y_t	0.593	0.228	0.365	0.639	0.643	0.306	0.692	0.382	0.066	0.471	0.121	0.348	0.349	0.593	0.640
y_{t-1}	-0.138	0.140	0.000	-0.080	-0.051	0.000	-0.064	-0.044	0.006	0.000	-0.028	0.000	0.000	0.229	-0.206
y_{t-2}	-0.105	0.061	0.000	-0.077	0.000	0.000	-0.008	0.000	-0.010	0.000	-0.015	0.000	0.000	-0.103	0.056
y_{t-3}	0.000	0.024	0.000	-0.034	0.000	0.000	-0.206	0.000	-0.022	0.000	-0.018	0.000	0.000	-0.152	0.003
y_{t-4}	0.000	-0.018	0.000	-0.094	0.000	0.000	-0.210	0.000	-0.030	0.000	-0.027	0.000	0.000	-0.183	-0.005
y_{t-5}	0.000	0.000	0.000	0.128	0.000	0.000	-0.033	0.000	0.000	0.000	0.070	0.000	0.000	-0.170	-0.142
y_{t-6}	0.000	0.000	0.000	0.250	0.000	0.000	0.006	0.000	0.000	0.000	0.048	0.000	0.000	-0.152	-0.163
y_{t-7}	0.000	0.000	0.000	0.000	0.000	0.000	-0.073	0.000	0.000	0.000	0.051	0.000	0.000	-0.165	-0.114
y_{t-8}	0.000	0.000	0.000	0.000	0.000	0.000	0.072	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
y_{t-9}	0.000	0.000	0.000	0.000	0.000	0.000	-0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.177
y_{t-10}	0.000	0.000	0.000	0.000	0.000	0.000	-0.239	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
i_{t-1}	0.646	0.477	0.726	0.475	0.507	0.805	0.216	0.653	0.951	0.724	0.935	0.330	0.849	0.477	0.585
i_{t-2}	-0.027	-0.059	-0.016	-0.060	-0.054	-0.009	-0.137	-0.026	-0.001	-0.017	-0.001	-0.096	-0.006	-0.061	-0.038
i_{t-3}	-0.012	-0.027	-0.007	-0.028	-0.025	-0.004	-0.068	-0.011	-0.000	-0.008	-0.000	-0.044	-0.003	-0.030	-0.017

Table 9: **Optimal feedback rule coefficients with preferences (1, 5, 0.5)**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa	den	gre	swe	uk
π_t	0.114	0.249	0.129	0.211	0.189	0.057	0.456	0.142	0.032	0.191	0.040	0.238	0.207	0.237	0.214
π_{t-1}	0.097	0.157	0.050	0.118	0.112	0.049	0.201	0.083	0.020	0.097	0.035	0.183	0.116	0.187	0.085
π_{t-2}	0.072	0.112	0.081	0.090	0.083	0.030	0.180	0.084	0.011	0.059	0.033	0.097	0.154	0.109	0.047
π_{t-3}	0.038	0.050	0.044	0.045	0.061	0.004	0.069	0.052	0.010	-0.003	0.021	0.100	0.070	0.017	0.057
π_{t-4}	-0.008	0.009	0.004	0.034	0.002	0.007	-0.036	0.008	-0.008	0.011	0.009	0.043	0.040	-0.004	0.019
π_{t-5}	-0.010	0.055	0.004	0.066	0.016	0.018	0.015	0.014	0.000	0.000	0.000	0.022	0.000	0.000	0.053
π_{t-6}	0.000	0.010	0.001	0.042	-0.015	0.017	0.064	-0.034	0.000	0.000	0.000	-0.001	0.000	0.000	0.012
π_{t-7}	0.000	0.007	-0.017	0.021	-0.024	0.016	0.077	-0.037	0.000	0.000	0.000	0.004	0.000	0.000	-0.043
π_{t-8}	0.000	-0.041	-0.011	-0.035	0.024	-0.013	-0.075	-0.007	0.000	0.000	0.000	0.005	0.000	0.000	0.000
π_{t-9}	0.000	-0.020	-0.015	-0.051	0.000	-0.015	0.051	-0.031	0.000	0.000	0.000	0.028	0.000	0.000	0.000
π_{t-10}	0.000	-0.044	0.021	-0.006	0.000	-0.010	-0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y_t	1.090	0.371	0.668	1.108	1.077	0.582	1.021	0.695	0.140	0.767	0.209	0.579	0.259	0.940	0.958
y_{t-1}	-0.241	0.235	0.000	-0.127	-0.086	0.000	-0.061	-0.079	0.016	0.000	-0.070	0.000	0.000	0.414	-0.296
y_{t-2}	-0.188	0.105	0.000	-0.148	0.000	0.000	0.038	0.000	-0.020	0.000	-0.043	0.000	0.000	-0.105	0.126
y_{t-3}	0.000	0.044	0.000	-0.090	0.000	0.000	-0.288	0.000	-0.047	0.000	-0.040	0.000	0.000	-0.184	0.044
y_{t-4}	0.000	-0.031	0.000	-0.202	0.000	0.000	-0.328	0.000	-0.065	0.000	-0.042	0.000	0.000	-0.251	0.021
y_{t-5}	0.000	0.000	0.000	0.190	0.000	0.000	-0.046	0.000	0.000	0.000	0.143	0.000	0.000	-0.243	-0.197
y_{t-6}	0.000	0.000	0.000	0.420	0.000	0.000	0.029	0.000	0.000	0.000	0.099	0.000	0.000	-0.228	-0.235
y_{t-7}	0.000	0.000	0.000	0.000	0.000	0.000	-0.095	0.000	0.000	0.000	0.097	0.000	0.000	-0.259	-0.166
y_{t-8}	0.000	0.000	0.000	0.000	0.000	0.000	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
y_{t-9}	0.000	0.000	0.000	0.000	0.000	0.000	-0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.276
y_{t-10}	0.000	0.000	0.000	0.000	0.000	0.000	-0.356	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
i_{t-1}	0.531	0.324	0.629	0.330	0.367	0.725	0.062	0.535	0.909	0.638	0.905	0.155	0.838	0.351	0.478
i_{t-2}	-0.049	-0.100	-0.030	-0.099	-0.089	-0.017	-0.197	-0.047	-0.002	-0.029	-0.002	-0.155	-0.006	-0.094	-0.059
i_{t-3}	-0.022	-0.047	-0.013	-0.047	-0.042	-0.007	-0.101	-0.021	-0.001	-0.013	-0.001	-0.073	-0.003	-0.047	-0.027

Table 10: **Optimal feedback rule coefficients with preferences (1, 1, 1)**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa	den	gre	swe	uk
π_t	0.040	0.112	0.058	0.083	0.075	0.019	0.262	0.041	0.011	0.119	0.027	0.090	0.155	0.123	0.114
π_{t-1}	0.034	0.070	0.022	0.049	0.044	0.017	0.102	0.024	0.007	0.057	0.024	0.073	0.086	0.093	0.045
π_{t-2}	0.025	0.055	0.037	0.043	0.034	0.011	0.107	0.026	0.004	0.035	0.022	0.046	0.115	0.052	0.030
π_{t-3}	0.014	0.030	0.020	0.028	0.026	0.002	0.060	0.016	0.003	-0.001	0.014	0.051	0.052	0.010	0.038
π_{t-4}	-0.004	0.006	0.000	0.019	0.000	0.003	-0.004	0.001	-0.003	0.008	0.006	0.022	0.030	-0.003	0.013
π_{t-5}	-0.004	0.021	-0.000	0.027	0.006	0.006	0.028	0.002	0.000	0.000	0.000	0.012	0.000	0.000	0.027
π_{t-6}	0.000	-0.004	-0.001	0.013	-0.007	0.005	0.050	-0.012	0.000	0.000	0.000	0.003	0.000	0.000	0.003
π_{t-7}	0.000	-0.007	-0.008	0.003	-0.009	0.004	0.046	-0.012	0.000	0.000	0.000	0.005	0.000	0.000	-0.025
π_{t-8}	0.000	-0.028	-0.005	-0.019	0.011	-0.005	-0.049	-0.002	0.000	0.000	0.000	0.005	0.000	0.000	0.000
π_{t-9}	0.000	-0.014	-0.006	-0.022	0.000	-0.005	0.032	-0.009	0.000	0.000	0.000	0.012	0.000	0.000	0.000
π_{t-10}	0.000	-0.023	0.010	-0.003	0.000	-0.004	-0.017	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y_t	0.228	0.099	0.132	0.264	0.296	0.108	0.326	0.136	0.017	0.183	0.040	0.147	0.160	0.244	0.252
y_{t-1}	-0.057	0.058	0.000	-0.027	-0.024	0.000	-0.052	-0.016	0.001	0.000	-0.007	0.000	0.000	0.068	-0.097
y_{t-2}	-0.041	0.024	0.000	-0.020	0.000	0.000	-0.026	0.000	-0.003	0.000	-0.003	0.000	0.000	-0.076	0.005
y_{t-3}	0.000	0.009	0.000	-0.001	0.000	0.000	-0.111	0.000	-0.006	0.000	-0.005	0.000	0.000	-0.093	-0.017
y_{t-4}	0.000	-0.007	0.000	-0.027	0.000	0.000	-0.103	0.000	-0.008	0.000	-0.008	0.000	0.000	-0.098	-0.018
y_{t-5}	0.000	0.000	0.000	0.059	0.000	0.000	-0.024	0.000	0.000	0.000	0.021	0.000	0.000	-0.086	-0.070
y_{t-6}	0.000	0.000	0.000	0.104	0.000	0.000	-0.011	0.000	0.000	0.000	0.014	0.000	0.000	-0.072	-0.074
y_{t-7}	0.000	0.000	0.000	0.000	0.000	0.000	-0.048	0.000	0.000	0.000	0.016	0.000	0.000	-0.072	-0.051
y_{t-8}	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
y_{t-9}	0.000	0.000	0.000	0.000	0.000	0.000	-0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.071
y_{t-10}	0.000	0.000	0.000	0.000	0.000	0.000	-0.117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
i_{t-1}	0.792	0.662	0.836	0.657	0.681	0.906	0.439	0.791	0.985	0.830	0.971	0.556	0.911	0.648	0.736
i_{t-2}	-0.011	-0.025	-0.006	-0.026	-0.025	-0.003	-0.070	-0.010	-0.000	-0.007	-0.000	-0.042	-0.003	-0.028	-0.015
i_{t-3}	-0.005	-0.011	-0.003	-0.012	-0.012	-0.001	-0.033	-0.004	-0.000	-0.003	-0.000	-0.018	-0.001	-0.013	-0.007

Table 11: **Optimal feedback rule coefficients with preferences (1, 1, 5)**

	aus	bel	fin	fra	ger	ire	ita	lux	net	por	spa	den	gre	swe	uk
π_t	0.013	0.054	0.022	0.041	0.032	0.005	0.132	0.018	0.002	0.046	0.007	0.041	0.061	-0.001	0.044
π_{t-1}	0.011	0.033	0.008	0.025	0.018	0.004	0.050	0.010	0.002	0.022	0.006	0.034	0.034	0.044	0.017
π_{t-2}	0.008	0.026	0.014	0.022	0.015	0.003	0.056	0.011	0.001	0.014	0.005	0.023	0.045	0.017	0.012
π_{t-3}	0.005	0.014	0.008	0.015	0.012	0.001	0.035	0.006	0.001	-0.000	0.003	0.026	0.021	0.012	0.016
π_{t-4}	-0.001	0.001	-0.000	0.009	0.000	0.001	0.002	-0.001	-0.001	0.003	0.001	0.012	0.012	0.016	0.005
π_{t-5}	-0.001	0.008	-0.000	0.012	0.003	0.002	0.018	-0.001	0.000	0.000	0.000	0.007	0.000	0.000	0.011
π_{t-6}	0.000	-0.005	-0.000	0.004	-0.003	0.001	0.027	-0.007	0.000	0.000	0.000	0.003	0.000	0.000	0.001
π_{t-7}	0.000	-0.006	-0.003	-0.000	-0.004	0.001	0.024	-0.006	0.000	0.000	0.000	0.003	0.000	0.000	-0.010
π_{t-8}	0.000	-0.015	-0.002	-0.010	0.005	-0.001	-0.026	-0.001	0.000	0.000	0.000	0.003	0.000	0.000	0.000
π_{t-9}	0.000	-0.008	-0.002	-0.011	0.000	-0.001	0.016	-0.004	0.000	0.000	0.000	0.006	0.000	0.000	0.000
π_{t-10}	0.000	-0.011	0.004	-0.001	0.000	-0.001	-0.009	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y_t	0.065	0.032	0.037	0.091	0.102	0.026	0.113	0.037	0.003	0.057	0.009	0.049	0.062	0.058	0.064
y_{t-1}	-0.015	0.018	0.000	-0.005	-0.008	0.000	-0.031	-0.004	0.000	0.000	-0.001	0.000	0.000	0.002	-0.034
y_{t-2}	-0.012	0.007	0.000	-0.002	0.000	0.000	-0.022	0.000	-0.001	0.000	-0.000	0.000	0.000	-0.037	-0.007
y_{t-3}	0.000	0.003	0.000	0.004	0.000	0.000	-0.049	0.000	-0.001	0.000	-0.001	0.000	0.000	-0.039	-0.013
y_{t-4}	0.000	-0.002	0.000	-0.007	0.000	0.000	-0.044	0.000	-0.002	0.000	-0.002	0.000	0.000	-0.036	-0.012
y_{t-5}	0.000	0.000	0.000	0.020	0.000	0.000	-0.016	0.000	0.000	0.000	0.005	0.000	0.000	-0.030	-0.024
y_{t-6}	0.000	0.000	0.000	0.035	0.000	0.000	-0.012	0.000	0.000	0.000	0.003	0.000	0.000	-0.023	-0.023
y_{t-7}	0.000	0.000	0.000	0.000	0.000	0.000	-0.024	0.000	0.000	0.000	0.004	0.000	0.000	-0.020	-0.016
y_{t-8}	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.001
y_{t-9}	0.000	0.000	0.000	0.000	0.000	0.000	-0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.019
y_{t-10}	0.000	0.000	0.000	0.000	0.000	0.000	-0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
i_{t-1}	0.927	0.812	0.925	0.802	0.835	0.974	0.652	0.907	0.997	0.911	0.992	0.752	0.953	0.805	0.862
i_{t-2}	-0.003	-0.008	-0.002	-0.009	-0.009	-0.001	-0.027	-0.003	-0.000	-0.002	-0.000	-0.014	-0.001	-0.008	-0.004
i_{t-3}	-0.001	-0.003	-0.001	-0.004	-0.004	-0.000	-0.012	-0.001	-0.000	-0.001	-0.000	-0.006	-0.000	-0.004	-0.002

Figure 14: Absolute losses with preferences (1, 0.2, 0.5) for the initial Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA
						Benchmark					
inf	0,002%	0,007%	0,007%	0,003%	0,003%	0,002%	0,012%	0,005%	0,007%	0,023%	0,010%
out	0,143%	0,037%	0,063%	0,118%	0,098%	0,074%	0,076%	0,073%	0,051%	0,084%	0,102%
desired	0,0009%	0,0003%	0,0004%	0,0013%	0,0019%	0,0002%	0,0042%	0,0003%	0,0000%	0,0031%	0,0004%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,031%**	**0,015%**	**0,020%**	**0,027%**	**0,024%**	**0,017%**	**0,029%**	**0,020%**	**0,017%**	**0,041%**	**0,031%**
						ECB Rule					
inf	0,002%	0,007%	0,007%	0,003%	0,003%	0,002%	0,021%	0,005%	0,007%	0,031%	0,011%
out	0,146%	0,040%	0,063%	0,129%	0,104%	0,075%	0,086%	0,074%	0,051%	0,086%	0,102%
desired	0,0009%	0,0004%	0,0005%	0,0011%	0,0013%	0,0005%	0,0029%	0,0005%	0,0004%	0,0017%	0,0005%
decided	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%
loss	**0,031%**	**0,015%**	**0,020%**	**0,029%**	**0,024%**	**0,018%**	**0,038%**	**0,020%**	**0,017%**	**0,049%**	**0,032%**
						Nationalistic Rule					
inf	0,002%	0,007%	0,007%	0,003%	0,003%	0,002%	0,027%	0,005%	0,007%	0,031%	0,011%
out	0,147%	0,040%	0,063%	0,130%	0,105%	0,075%	0,088%	0,074%	0,051%	0,086%	0,102%
desired	0,0007%	0,0002%	0,0003%	0,0010%	0,0012%	0,0002%	0,0029%	0,0003%	0,0001%	0,0014%	0,0001%
decided	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%
loss	**0,031%**	**0,015%**	**0,020%**	**0,029%**	**0,024%**	**0,017%**	**0,045%**	**0,020%**	**0,017%**	**0,049%**	**0,032%**
						EMS Rule					
inf	0,002%	0,007%	0,007%	0,003%	0,003%	0,002%	0,034%	0,005%	0,007%	0,031%	0,011%
out	0,146%	0,043%	0,063%	0,131%	0,098%	0,074%	0,108%	0,074%	0,051%	0,086%	0,102%
desired	0,0020%	0,0012%	0,0017%	0,0019%	0,0019%	0,0018%	0,0033%	0,0015%	0,0019%	0,0027%	0,0019%
decided	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%
loss	**0,032%**	**0,017%**	**0,021%**	**0,030%**	**0,024%**	**0,018%**	**0,057%**	**0,021%**	**0,018%**	**0,050%**	**0,032%**

Figure 15: Absolute losses with preferences (1, 1, 0.5) for the initial Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA
						Benchmark					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,013%	0,006%	0,006%	0,022%	0,010%
out	0,134%	0,039%	0,061%	0,122%	0,098%	0,068%	0,070%	0,072%	0,050%	0,086%	0,092%
desired	0,0083%	0,0014%	0,0025%	0,0094%	0,0104%	0,0020%	0,0140%	0,0026%	0,0001%	0,0068%	0,0007%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,140%**	**0,046%**	**0,068%**	**0,130%**	**0,106%**	**0,072%**	**0,090%**	**0,080%**	**0,056%**	**0,111%**	**0,103%**
						ECB Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,027%	0,006%	0,006%	0,028%	0,011%
out	0,140%	0,042%	0,062%	0,133%	0,107%	0,069%	0,093%	0,075%	0,050%	0,089%	0,093%
desired	0,0076%	0,0018%	0,0032%	0,0085%	0,0083%	0,0030%	0,0116%	0,0032%	0,0022%	0,0057%	0,0024%
decided	0,0024%	0,0024%	0,0024%	0,0024%	0,0024%	0,0024%	0,0024%	0,0024%	0,0024%	0,0024%	0,0024%
loss	**0,142%**	**0,050%**	**0,070%**	**0,138%**	**0,112%**	**0,073%**	**0,121%**	**0,082%**	**0,057%**	**0,119%**	**0,105%**
						Nationalistic Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,031%	0,006%	0,006%	0,028%	0,011%
out	0,139%	0,041%	0,062%	0,134%	0,111%	0,069%	0,095%	0,074%	0,050%	0,090%	0,093%
desired	0,0067%	0,0012%	0,0019%	0,0083%	0,0079%	0,0016%	0,0110%	0,0022%	0,0004%	0,0047%	0,0006%
decided	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%
loss	**0,141%**	**0,048%**	**0,068%**	**0,138%**	**0,114%**	**0,072%**	**0,127%**	**0,081%**	**0,057%**	**0,119%**	**0,104%**
						EMS Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,048%	0,006%	0,006%	0,028%	0,011%
out	0,141%	0,048%	0,062%	0,141%	0,098%	0,070%	0,140%	0,076%	0,050%	0,090%	0,093%
desired	0,0118%	0,0044%	0,0080%	0,0111%	0,0104%	0,0089%	0,0133%	0,0072%	0,0097%	0,0104%	0,0098%
decided	0,0104%	0,0104%	0,0104%	0,0104%	0,0104%	0,0104%	0,0104%	0,0104%	0,0104%	0,0104%	0,0104%
loss	**0,148%**	**0,060%**	**0,074%**	**0,149%**	**0,106%**	**0,078%**	**0,193%**	**0,087%**	**0,061%**	**0,123%**	**0,109%**

Figure 16: Absolute losses with preferences (1, 1, 0.25) for the initial Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA
						Benchmark					
inf	0,002%	0,008%	0,006%	0,003%	0,003%	0,002%	0,012%	0,006%	0,007%	0,024%	0,008%
out	0,142%	0,038%	0,061%	0,111%	0,091%	0,071%	0,061%	0,072%	0,052%	0,083%	0,097%
desired	0,0217%	0,0027%	0,0063%	0,0228%	0,0204%	0,0052%	0,0255%	0,0069%	0,0003%	0,0153%	0,0017%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,149%**	**0,046%**	**0,069%**	**0,120%**	**0,099%**	**0,075%**	**0,079%**	**0,080%**	**0,059%**	**0,110%**	**0,105%**
						ECB Rule					
inf	0,002%	0,008%	0,006%	0,003%	0,003%	0,002%	0,022%	0,006%	0,007%	0,033%	0,009%
out	0,152%	0,042%	0,064%	0,122%	0,102%	0,073%	0,081%	0,075%	0,052%	0,090%	0,097%
desired	0,0193%	0,0034%	0,0070%	0,0209%	0,0174%	0,0067%	0,0211%	0,0076%	0,0045%	0,0130%	0,0050%
decided	0,0050%	0,0050%	0,0050%	0,0050%	0,0050%	0,0050%	0,0050%	0,0050%	0,0050%	0,0050%	0,0050%
loss	**0,155%**	**0,051%**	**0,072%**	**0,126%**	**0,106%**	**0,077%**	**0,105%**	**0,082%**	**0,061%**	**0,124%**	**0,107%**
						Nationalistic Rule					
inf	0,002%	0,008%	0,006%	0,003%	0,003%	0,003%	0,026%	0,006%	0,007%	0,034%	0,009%
out	0,151%	0,041%	0,064%	0,124%	0,107%	0,073%	0,088%	0,075%	0,052%	0,090%	0,097%
desired	0,0177%	0,0024%	0,0050%	0,0208%	0,0170%	0,0043%	0,0201%	0,0061%	0,0010%	0,0111%	0,0015%
decided	0,0010%	0,0010%	0,0010%	0,0010%	0,0010%	0,0010%	0,0010%	0,0010%	0,0010%	0,0010%	0,0010%
loss	**0,153%**	**0,049%**	**0,070%**	**0,127%**	**0,110%**	**0,076%**	**0,113%**	**0,081%**	**0,060%**	**0,124%**	**0,106%**
						EMS Rule					
inf	0,002%	0,008%	0,006%	0,003%	0,003%	0,003%	0,042%	0,006%	0,007%	0,033%	0,009%
out	0,154%	0,051%	0,065%	0,131%	0,091%	0,074%	0,132%	0,077%	0,052%	0,090%	0,097%
desired	0,0262%	0,0070%	0,0152%	0,0246%	0,0204%	0,0165%	0,0243%	0,0136%	0,0183%	0,0210%	0,0186%
decided	0,0204%	0,0204%	0,0204%	0,0204%	0,0204%	0,0204%	0,0204%	0,0204%	0,0204%	0,0204%	0,0204%
loss	**0,161%**	**0,064%**	**0,076%**	**0,139%**	**0,099%**	**0,081%**	**0,179%**	**0,088%**	**0,064%**	**0,128%**	**0,111%**

Figure 17: Absolute losses with preferences (1, 5, 0.5) for the initial Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA
						Benchmark					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,014%	0,006%	0,006%	0,024%	0,008%
out	0,127%	0,038%	0,060%	0,112%	0,085%	0,074%	0,060%	0,073%	0,050%	0,083%	0,094%
desired	0,0671%	0,0071%	0,0190%	0,0770%	0,0562%	0,0178%	0,0566%	0,0222%	0,0011%	0,0346%	0,0049%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,669%**	**0,202%**	**0,314%**	**0,603%**	**0,456%**	**0,384%**	**0,341%**	**0,382%**	**0,256%**	**0,458%**	**0,480%**
						ECB Rule					
inf	0,002%	0,007%	0,007%	0,003%	0,003%	0,002%	0,028%	0,006%	0,006%	0,033%	0,009%
out	0,139%	0,046%	0,064%	0,130%	0,096%	0,078%	0,086%	0,077%	0,050%	0,091%	0,094%
desired	0,0593%	0,0080%	0,0210%	0,0651%	0,0498%	0,0209%	0,0474%	0,0229%	0,0126%	0,0322%	0,0143%
decided	0,0144%	0,0144%	0,0144%	0,0144%	0,0144%	0,0144%	0,0144%	0,0144%	0,0144%	0,0144%	0,0144%
loss	**0,703%**	**0,244%**	**0,334%**	**0,662%**	**0,488%**	**0,399%**	**0,467%**	**0,400%**	**0,263%**	**0,493%**	**0,488%**
						Nationalistic Rule					
inf	0,002%	0,007%	0,007%	0,003%	0,003%	0,002%	0,037%	0,006%	0,006%	0,033%	0,009%
out	0,139%	0,043%	0,063%	0,135%	0,101%	0,078%	0,093%	0,077%	0,050%	0,091%	0,094%
desired	0,0561%	0,0063%	0,0163%	0,0623%	0,0479%	0,0148%	0,0432%	0,0199%	0,0032%	0,0276%	0,0048%
decided	0,0031%	0,0031%	0,0031%	0,0031%	0,0031%	0,0031%	0,0031%	0,0031%	0,0031%	0,0031%	0,0031%
loss	**0,697%**	**0,225%**	**0,325%**	**0,678%**	**0,511%**	**0,393%**	**0,506%**	**0,392%**	**0,257%**	**0,489%**	**0,482%**
						EMS Rule					
inf	0,002%	0,007%	0,007%	0,003%	0,003%	0,002%	0,046%	0,006%	0,006%	0,032%	0,009%
out	0,141%	0,056%	0,065%	0,144%	0,085%	0,078%	0,149%	0,079%	0,050%	0,091%	0,094%
desired	0,0713%	0,0139%	0,0375%	0,0715%	0,0562%	0,0423%	0,0601%	0,0344%	0,0468%	0,0498%	0,0490%
decided	0,0562%	0,0562%	0,0562%	0,0562%	0,0562%	0,0562%	0,0562%	0,0562%	0,0562%	0,0562%	0,0562%
loss	**0,736%**	**0,314%**	**0,359%**	**0,751%**	**0,456%**	**0,421%**	**0,820%**	**0,428%**	**0,283%**	**0,515%**	**0,509%**

Figure 18: Absolute losses with preferences (1, 1, 1) for the initial Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA
						Benchmark					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,015%	0,006%	0,006%	0,023%	0,011%
out	0,139%	0,036%	0,059%	0,114%	0,098%	0,073%	0,064%	0,075%	0,048%	0,089%	0,099%
desired	0,0033%	0,0006%	0,0009%	0,0038%	0,0051%	0,0008%	0,0064%	0,0009%	0,0000%	0,0030%	0,0003%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,144%**	**0,044%**	**0,066%**	**0,121%**	**0,106%**	**0,076%**	**0,086%**	**0,081%**	**0,054%**	**0,115%**	**0,110%**
						ECB Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,027%	0,006%	0,006%	0,028%	0,011%
out	0,143%	0,039%	0,060%	0,125%	0,106%	0,075%	0,080%	0,076%	0,048%	0,092%	0,099%
desired	0,0031%	0,0009%	0,0013%	0,0036%	0,0038%	0,0013%	0,0053%	0,0013%	0,0010%	0,0022%	0,0011%
decided	0,0011%	0,0011%	0,0011%	0,0011%	0,0011%	0,0011%	0,0011%	0,0011%	0,0011%	0,0011%	0,0011%
loss	**0,146%**	**0,047%**	**0,068%**	**0,129%**	**0,110%**	**0,078%**	**0,108%**	**0,083%**	**0,055%**	**0,121%**	**0,112%**
						Nationalistic Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,033%	0,006%	0,006%	0,028%	0,011%
out	0,143%	0,038%	0,060%	0,127%	0,108%	0,074%	0,083%	0,076%	0,048%	0,092%	0,099%
desired	0,0026%	0,0005%	0,0007%	0,0034%	0,0036%	0,0006%	0,0051%	0,0008%	0,0002%	0,0017%	0,0002%
decided	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%
loss	**0,145%**	**0,045%**	**0,067%**	**0,130%**	**0,112%**	**0,077%**	**0,116%**	**0,082%**	**0,054%**	**0,121%**	**0,111%**
						EMS Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,045%	0,006%	0,006%	0,028%	0,011%
out	0,143%	0,043%	0,061%	0,130%	0,098%	0,075%	0,111%	0,076%	0,048%	0,092%	0,099%
desired	0,0056%	0,0026%	0,0041%	0,0053%	0,0051%	0,0046%	0,0060%	0,0037%	0,0049%	0,0049%	0,0049%
decided	0,0051%	0,0051%	0,0051%	0,0051%	0,0051%	0,0051%	0,0051%	0,0051%	0,0051%	0,0051%	0,0051%
loss	**0,150%**	**0,055%**	**0,072%**	**0,138%**	**0,106%**	**0,082%**	**0,161%**	**0,087%**	**0,059%**	**0,126%**	**0,116%**

Figure 19: Absolute losses with preferences (1, 1, 5) for the initial Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA
						Benchmark					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,019%	0,006%	0,006%	0,026%	0,011%
out	0,143%	0,040%	0,066%	0,121%	0,100%	0,072%	0,072%	0,076%	0,049%	0,084%	0,105%
desired	0,0003%	0,0001%	0,0001%	0,0006%	0,0007%	0,0001%	0,0011%	0,0001%	0,0000%	0,0004%	0,0000%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,146%**	**0,048%**	**0,072%**	**0,127%**	**0,106%**	**0,075%**	**0,097%**	**0,082%**	**0,055%**	**0,111%**	**0,115%**
						ECB Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,028%	0,006%	0,006%	0,029%	0,011%
out	0,144%	0,042%	0,066%	0,125%	0,105%	0,073%	0,083%	0,076%	0,049%	0,084%	0,105%
desired	0,0003%	0,0001%	0,0002%	0,0004%	0,0005%	0,0002%	0,0007%	0,0002%	0,0001%	0,0003%	0,0001%
decided	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%
loss	**0,147%**	**0,049%**	**0,073%**	**0,129%**	**0,108%**	**0,076%**	**0,111%**	**0,083%**	**0,056%**	**0,113%**	**0,116%**
						Nationalistic Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,032%	0,006%	0,006%	0,029%	0,011%
out	0,144%	0,041%	0,066%	0,128%	0,106%	0,073%	0,085%	0,076%	0,049%	0,084%	0,105%
desired	0,0002%	0,0001%	0,0001%	0,0004%	0,0004%	0,0000%	0,0007%	0,0001%	0,0000%	0,0002%	0,0000%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,146%**	**0,049%**	**0,072%**	**0,131%**	**0,109%**	**0,075%**	**0,117%**	**0,082%**	**0,055%**	**0,113%**	**0,116%**
						EMS Rule					
inf	0,002%	0,007%	0,006%	0,003%	0,003%	0,002%	0,035%	0,006%	0,006%	0,029%	0,011%
out	0,145%	0,044%	0,066%	0,129%	0,100%	0,073%	0,095%	0,077%	0,049%	0,084%	0,105%
desired	0,0008%	0,0005%	0,0006%	0,0008%	0,0007%	0,0007%	0,0009%	0,0006%	0,0007%	0,0007%	0,0007%
decided	0,0007%	0,0007%	0,0007%	0,0007%	0,0007%	0,0007%	0,0007%	0,0007%	0,0007%	0,0007%	0,0007%
loss	**0,150%**	**0,054%**	**0,076%**	**0,136%**	**0,106%**	**0,079%**	**0,134%**	**0,086%**	**0,058%**	**0,116%**	**0,119%**

Figure 20: Absolute losses with preferences (1, 0.2, 0.5) in the enlarged Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK
								Benchmark							
inf	0,002%	0,004%	0,006%	0,001%	0,002%	0,002%	0,006%	0,005%	0,004%	0,041%	0,007%	0,001%	0,041%	0,007%	0,006%
out	0,118%	0,072%	0,220%	0,030%	0,074%	0,006%	0,048%	0,154%	0,044%	0,078%	0,059%	0,063%	0,035%	0,042%	0,020%
desired	0,0008%	0,0004%	0,0012%	0,0003%	0,0014%	0,0000%	0,0026%	0,0007%	0,0000%	0,0039%	0,0003%	0,0004%	0,0117%	0,0016%	0,0010%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,026%**	**0,019%**	**0,051%**	**0,007%**	**0,018%**	**0,003%**	**0,017%**	**0,036%**	**0,013%**	**0,059%**	**0,019%**	**0,014%**	**0,054%**	**0,016%**	**0,011%**
								ECB Rule							
inf	0,002%	0,004%	0,007%	0,001%	0,003%	0,002%	0,011%	0,005%	0,004%	0,052%	0,008%	0,001%	0,094%	0,008%	0,008%
out	0,120%	0,074%	0,222%	0,032%	0,079%	0,006%	0,056%	0,155%	0,044%	0,080%	0,059%	0,065%	0,034%	0,049%	0,021%
desired	0,0006%	0,0003%	0,0008%	0,0003%	0,0009%	0,0002%	0,0018%	0,0006%	0,0002%	0,0017%	0,0002%	0,0004%	0,0053%	0,0008%	0,0006%
decided	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%	0,0002%
loss	**0,026%**	**0,019%**	**0,051%**	**0,008%**	**0,019%**	**0,003%**	**0,023%**	**0,037%**	**0,013%**	**0,068%**	**0,019%**	**0,014%**	**0,101%**	**0,017%**	**0,012%**
								Nationalistic Rule							
inf	0,002%	0,004%	0,007%	0,001%	0,003%	0,002%	0,014%	0,005%	0,004%	0,052%	0,008%	0,001%	0,095%	0,008%	0,008%
out	0,120%	0,074%	0,222%	0,032%	0,080%	0,006%	0,057%	0,156%	0,044%	0,080%	0,059%	0,064%	0,034%	0,049%	0,021%
desired	0,0006%	0,0003%	0,0007%	0,0003%	0,0009%	0,0001%	0,0018%	0,0005%	0,0001%	0,0016%	0,0001%	0,0004%	0,0052%	0,0008%	0,0005%
decided	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%
loss	**0,026%**	**0,019%**	**0,051%**	**0,007%**	**0,019%**	**0,003%**	**0,025%**	**0,037%**	**0,013%**	**0,068%**	**0,019%**	**0,014%**	**0,101%**	**0,017%**	**0,012%**
								EMS Rule							
inf	0,002%	0,004%	0,007%	0,001%	0,002%	0,002%	0,022%	0,005%	0,004%	0,052%	0,008%	0,001%	0,096%	0,008%	0,008%
out	0,120%	0,077%	0,222%	0,035%	0,074%	0,006%	0,074%	0,155%	0,044%	0,080%	0,059%	0,071%	0,034%	0,052%	0,022%
desired	0,0015%	0,0010%	0,0018%	0,0010%	0,0014%	0,0013%	0,0022%	0,0014%	0,0014%	0,0026%	0,0014%	0,0009%	0,0063%	0,0014%	0,0013%
decided	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%	0,0014%
loss	**0,027%**	**0,020%**	**0,052%**	**0,009%**	**0,018%**	**0,004%**	**0,038%**	**0,037%**	**0,013%**	**0,069%**	**0,020%**	**0,016%**	**0,103%**	**0,019%**	**0,013%**

Figure 21: Absolute losses with preferences (1, 1, 0.5) for the enlarged Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK
								Benchmark							
inf	0,002%	0,004%	0,006%	0,001%	0,002%	0,002%	0,007%	0,006%	0,004%	0,043%	0,008%	0,001%	0,048%	0,006%	0,006%
out	0,118%	0,064%	0,216%	0,028%	0,068%	0,005%	0,043%	0,141%	0,045%	0,077%	0,055%	0,060%	0,036%	0,038%	0,019%
desired	0,0071%	0,0020%	0,0085%	0,0022%	0,0076%	0,0002%	0,0083%	0,0049%	0,0001%	0,0070%	0,0004%	0,0028%	0,0102%	0,0079%	0,0030%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,123%**	**0,069%**	**0,227%**	**0,030%**	**0,074%**	**0,007%**	**0,054%**	**0,149%**	**0,049%**	**0,123%**	**0,063%**	**0,062%**	**0,089%**	**0,048%**	**0,026%**
								ECB Rule							
inf	0,002%	0,004%	0,007%	0,001%	0,002%	0,002%	0,014%	0,006%	0,004%	0,055%	0,009%	0,001%	0,105%	0,007%	0,007%
out	0,123%	0,067%	0,222%	0,031%	0,074%	0,006%	0,054%	0,146%	0,045%	0,081%	0,055%	0,064%	0,035%	0,047%	0,021%
desired	0,0058%	0,0019%	0,0063%	0,0022%	0,0059%	0,0007%	0,0067%	0,0044%	0,0008%	0,0045%	0,0008%	0,0029%	0,0054%	0,0050%	0,0020%
decided	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%
loss	**0,125%**	**0,071%**	**0,229%**	**0,033%**	**0,077%**	**0,008%**	**0,069%**	**0,152%**	**0,049%**	**0,136%**	**0,065%**	**0,065%**	**0,141%**	**0,055%**	**0,028%**
								Nationalistic Rule							
inf	0,002%	0,004%	0,007%	0,001%	0,002%	0,002%	0,015%	0,006%	0,004%	0,055%	0,009%	0,001%	0,105%	0,007%	0,007%
out	0,123%	0,067%	0,222%	0,031%	0,076%	0,006%	0,056%	0,146%	0,045%	0,081%	0,055%	0,063%	0,035%	0,048%	0,021%
desired	0,0056%	0,0018%	0,0060%	0,0021%	0,0058%	0,0003%	0,0066%	0,0043%	0,0004%	0,0042%	0,0004%	0,0028%	0,0051%	0,0048%	0,0017%
decided	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%	0,0003%
loss	**0,125%**	**0,071%**	**0,229%**	**0,032%**	**0,079%**	**0,007%**	**0,072%**	**0,152%**	**0,049%**	**0,136%**	**0,064%**	**0,065%**	**0,141%**	**0,056%**	**0,028%**
								EMS Rule							
inf	0,002%	0,004%	0,007%	0,001%	0,002%	0,002%	0,024%	0,006%	0,004%	0,055%	0,009%	0,001%	0,105%	0,008%	0,008%
out	0,124%	0,072%	0,223%	0,037%	0,068%	0,006%	0,080%	0,146%	0,045%	0,081%	0,055%	0,072%	0,035%	0,053%	0,023%
desired	0,0091%	0,0042%	0,0104%	0,0046%	0,0076%	0,0058%	0,0080%	0,0075%	0,0073%	0,0087%	0,0071%	0,0043%	0,0107%	0,0072%	0,0050%
decided	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%	0,0076%
loss	**0,130%**	**0,079%**	**0,234%**	**0,042%**	**0,074%**	**0,011%**	**0,107%**	**0,155%**	**0,053%**	**0,140%**	**0,068%**	**0,077%**	**0,144%**	**0,065%**	**0,035%**

Figure 22: Absolute losses with preferences (1, 1, 0.25) for the enlarged Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK
								Benchmark							
inf	0,002%	0,004%	0,006%	0,001%	0,002%	0,002%	0,007%	0,005%	0,004%	0,043%	0,006%	0,001%	0,043%	0,005%	0,005%
out	0,116%	0,072%	0,225%	0,030%	0,064%	0,005%	0,042%	0,143%	0,045%	0,075%	0,053%	0,064%	0,036%	0,037%	0,017%
desired	0,0178%	0,0050%	0,0221%	0,0059%	0,0150%	0,0004%	0,0170%	0,0132%	0,0002%	0,0142%	0,0010%	0,0071%	0,0193%	0,0172%	0,0057%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,123%**	**0,077%**	**0,236%**	**0,033%**	**0,071%**	**0,007%**	**0,053%**	**0,152%**	**0,049%**	**0,122%**	**0,059%**	**0,067%**	**0,084%**	**0,047%**	**0,023%**
								ECB Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,003%	0,002%	0,015%	0,006%	0,004%	0,057%	0,006%	0,001%	0,084%	0,006%	0,007%
out	0,124%	0,076%	0,235%	0,035%	0,071%	0,006%	0,056%	0,150%	0,045%	0,082%	0,053%	0,069%	0,035%	0,049%	0,019%
desired	0,0149%	0,0044%	0,0171%	0,0053%	0,0123%	0,0014%	0,0138%	0,0121%	0,0017%	0,0104%	0,0017%	0,0068%	0,0119%	0,0114%	0,0042%
decided	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%	0,0017%
loss	**0,126%**	**0,081%**	**0,243%**	**0,036%**	**0,074%**	**0,008%**	**0,071%**	**0,156%**	**0,050%**	**0,139%**	**0,060%**	**0,071%**	**0,120%**	**0,056%**	**0,026%**
								Nationalistic Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,003%	0,002%	0,016%	0,006%	0,004%	0,057%	0,006%	0,001%	0,084%	0,006%	0,006%
out	0,124%	0,075%	0,235%	0,035%	0,072%	0,006%	0,060%	0,150%	0,045%	0,082%	0,053%	0,068%	0,035%	0,050%	0,019%
desired	0,0145%	0,0042%	0,0166%	0,0052%	0,0122%	0,0008%	0,0136%	0,0118%	0,0009%	0,0099%	0,0010%	0,0067%	0,0114%	0,0111%	0,0038%
decided	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%	0,0008%
loss	**0,126%**	**0,080%**	**0,243%**	**0,036%**	**0,075%**	**0,008%**	**0,076%**	**0,156%**	**0,049%**	**0,138%**	**0,059%**	**0,069%**	**0,119%**	**0,056%**	**0,026%**
								EMS Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,002%	0,002%	0,030%	0,006%	0,004%	0,056%	0,006%	0,001%	0,085%	0,007%	0,008%
out	0,125%	0,082%	0,236%	0,042%	0,064%	0,006%	0,096%	0,150%	0,046%	0,082%	0,053%	0,082%	0,035%	0,059%	0,022%
desired	0,0202%	0,0074%	0,0236%	0,0086%	0,0150%	0,0101%	0,0165%	0,0170%	0,0138%	0,0169%	0,0138%	0,0086%	0,0222%	0,0149%	0,0091%
decided	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%	0,0150%
loss	**0,131%**	**0,090%**	**0,248%**	**0,047%**	**0,071%**	**0,012%**	**0,130%**	**0,160%**	**0,053%**	**0,142%**	**0,063%**	**0,087%**	**0,124%**	**0,070%**	**0,033%**

Figure 23: Absolute losses with preferences (1, 5, 0.5) for the enlarged Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK
								Benchmark							
inf	0,002%	0,004%	0,006%	0,001%	0,002%	0,002%	0,007%	0,004%	0,003%	0,045%	0,005%	0,001%	0,060%	0,005%	0,005%
out	0,104%	0,066%	0,197%	0,026%	0,057%	0,005%	0,040%	0,139%	0,043%	0,079%	0,053%	0,059%	0,035%	0,033%	0,016%
desired	0,0568%	0,0116%	0,0641%	0,0189%	0,0390%	0,0013%	0,0378%	0,0430%	0,0009%	0,0333%	0,0028%	0,0196%	0,0079%	0,0330%	0,0104%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,552%**	**0,340%**	**1,024%**	**0,139%**	**0,305%**	**0,028%**	**0,225%**	**0,719%**	**0,219%**	**0,457%**	**0,271%**	**0,305%**	**0,239%**	**0,189%**	**0,093%**
								ECB Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,002%	0,002%	0,015%	0,005%	0,003%	0,059%	0,006%	0,001%	0,125%	0,007%	0,007%
out	0,116%	0,072%	0,210%	0,031%	0,064%	0,005%	0,053%	0,145%	0,043%	0,088%	0,053%	0,063%	0,035%	0,050%	0,019%
desired	0,0485%	0,0105%	0,0552%	0,0163%	0,0333%	0,0032%	0,0298%	0,0393%	0,0043%	0,0263%	0,0042%	0,0179%	0,0078%	0,0257%	0,0084%
decided	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%	0,0039%
loss	**0,583%**	**0,364%**	**1,061%**	**0,160%**	**0,324%**	**0,031%**	**0,283%**	**0,732%**	**0,221%**	**0,499%**	**0,273%**	**0,318%**	**0,301%**	**0,260%**	**0,103%**
								Nationalistic Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,002%	0,002%	0,016%	0,005%	0,003%	0,058%	0,006%	0,001%	0,124%	0,007%	0,007%
out	0,116%	0,071%	0,210%	0,031%	0,066%	0,005%	0,056%	0,145%	0,043%	0,088%	0,053%	0,063%	0,035%	0,051%	0,019%
desired	0,0481%	0,0102%	0,0546%	0,0159%	0,0333%	0,0020%	0,0289%	0,0391%	0,0024%	0,0258%	0,0026%	0,0177%	0,0064%	0,0252%	0,0079%
decided	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%	0,0019%
loss	**0,581%**	**0,361%**	**1,058%**	**0,157%**	**0,336%**	**0,030%**	**0,298%**	**0,733%**	**0,220%**	**0,498%**	**0,272%**	**0,316%**	**0,299%**	**0,263%**	**0,101%**
								EMS Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,002%	0,002%	0,029%	0,005%	0,003%	0,059%	0,006%	0,001%	0,125%	0,007%	0,008%
out	0,118%	0,080%	0,213%	0,043%	0,057%	0,006%	0,101%	0,146%	0,043%	0,088%	0,053%	0,079%	0,035%	0,062%	0,023%
desired	0,0578%	0,0152%	0,0683%	0,0216%	0,0390%	0,0219%	0,0387%	0,0483%	0,0332%	0,0404%	0,0337%	0,0216%	0,0327%	0,0335%	0,0172%
decided	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%	0,0390%
loss	**0,612%**	**0,424%**	**1,092%**	**0,235%**	**0,305%**	**0,051%**	**0,555%**	**0,753%**	**0,239%**	**0,518%**	**0,291%**	**0,417%**	**0,319%**	**0,336%**	**0,140%**

Figure 24: Absolute losses with preferences (1, 1, 1) for the enlarged Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK
								Benchmark							
inf	0,002%	0,004%	0,008%	0,001%	0,002%	0,002%	0,006%	0,005%	0,004%	0,037%	0,006%	0,001%	0,050%	0,007%	0,006%
out	0,112%	0,069%	0,230%	0,027%	0,071%	0,005%	0,043%	0,151%	0,044%	0,073%	0,055%	0,064%	0,035%	0,042%	0,019%
desired	0,0026%	0,0010%	0,0032%	0,0009%	0,0036%	0,0001%	0,0041%	0,0019%	0,0000%	0,0028%	0,0001%	0,0012%	0,0057%	0,0040%	0,0011%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,116%**	**0,075%**	**0,241%**	**0,029%**	**0,077%**	**0,007%**	**0,054%**	**0,158%**	**0,048%**	**0,113%**	**0,061%**	**0,066%**	**0,090%**	**0,053%**	**0,026%**
								ECB Rule							
inf	0,002%	0,004%	0,009%	0,001%	0,003%	0,002%	0,011%	0,005%	0,004%	0,044%	0,006%	0,001%	0,085%	0,008%	0,007%
out	0,116%	0,072%	0,236%	0,030%	0,079%	0,006%	0,052%	0,154%	0,045%	0,076%	0,055%	0,067%	0,034%	0,051%	0,020%
desired	0,0022%	0,0009%	0,0023%	0,0009%	0,0026%	0,0003%	0,0033%	0,0017%	0,0004%	0,0019%	0,0004%	0,0013%	0,0025%	0,0022%	0,0008%
decided	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%	0,0004%
loss	**0,118%**	**0,077%**	**0,245%**	**0,031%**	**0,082%**	**0,008%**	**0,063%**	**0,160%**	**0,049%**	**0,120%**	**0,062%**	**0,068%**	**0,119%**	**0,059%**	**0,027%**
								Nationalistic Rule							
inf	0,002%	0,004%	0,009%	0,001%	0,003%	0,002%	0,012%	0,006%	0,004%	0,044%	0,006%	0,001%	0,085%	0,008%	0,007%
out	0,116%	0,072%	0,236%	0,029%	0,080%	0,006%	0,054%	0,154%	0,044%	0,076%	0,055%	0,066%	0,034%	0,052%	0,020%
desired	0,0021%	0,0008%	0,0021%	0,0008%	0,0026%	0,0001%	0,0032%	0,0016%	0,0001%	0,0017%	0,0001%	0,0012%	0,0024%	0,0021%	0,0006%
decided	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%	0,0001%
loss	**0,118%**	**0,076%**	**0,245%**	**0,031%**	**0,083%**	**0,007%**	**0,066%**	**0,160%**	**0,048%**	**0,120%**	**0,062%**	**0,068%**	**0,119%**	**0,060%**	**0,027%**
								EMS Rule							
inf	0,002%	0,004%	0,009%	0,001%	0,002%	0,002%	0,023%	0,005%	0,004%	0,044%	0,006%	0,001%	0,087%	0,009%	0,007%
out	0,116%	0,076%	0,236%	0,037%	0,071%	0,006%	0,075%	0,153%	0,045%	0,076%	0,056%	0,074%	0,034%	0,056%	0,022%
desired	0,0041%	0,0022%	0,0044%	0,0024%	0,0036%	0,0030%	0,0039%	0,0034%	0,0035%	0,0041%	0,0034%	0,0022%	0,0052%	0,0034%	0,0025%
decided	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%	0,0036%
loss	**0,122%**	**0,084%**	**0,248%**	**0,041%**	**0,077%**	**0,011%**	**0,101%**	**0,162%**	**0,052%**	**0,123%**	**0,065%**	**0,078%**	**0,124%**	**0,068%**	**0,032%**

Figure 25: Absolute losses with preferences (1, 1, 5) for the enlarged Euroland

	AUS	BEL	FIN	FRA	GER	IRE	ITA	LUX	NET	POR	SPA	DEN	GRE	SWE	UK
								Benchmark							
inf	0,002%	0,004%	0,008%	0,001%	0,003%	0,002%	0,008%	0,005%	0,003%	0,046%	0,006%	0,001%	0,062%	0,007%	0,006%
out	0,126%	0,071%	0,227%	0,030%	0,078%	0,006%	0,051%	0,149%	0,042%	0,083%	0,058%	0,066%	0,034%	0,043%	0,019%
desired	0,0002%	0,0001%	0,0003%	0,0002%	0,0005%	0,0000%	0,0007%	0,0001%	0,0000%	0,0004%	0,0000%	0,0001%	0,0012%	0,0004%	0,0001%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,130%**	**0,075%**	**0,237%**	**0,032%**	**0,084%**	**0,007%**	**0,062%**	**0,155%**	**0,045%**	**0,131%**	**0,064%**	**0,067%**	**0,102%**	**0,052%**	**0,026%**
								ECB Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,003%	0,002%	0,011%	0,005%	0,003%	0,051%	0,006%	0,001%	0,103%	0,007%	0,006%
out	0,128%	0,072%	0,230%	0,033%	0,083%	0,006%	0,056%	0,150%	0,042%	0,086%	0,058%	0,067%	0,034%	0,047%	0,020%
desired	0,0002%	0,0001%	0,0002%	0,0001%	0,0003%	0,0000%	0,0005%	0,0001%	0,0000%	0,0002%	0,0000%	0,0002%	0,0004%	0,0002%	0,0001%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,130%**	**0,076%**	**0,238%**	**0,034%**	**0,087%**	**0,008%**	**0,067%**	**0,155%**	**0,045%**	**0,137%**	**0,064%**	**0,068%**	**0,138%**	**0,054%**	**0,026%**
								Nationalistic Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,003%	0,002%	0,012%	0,005%	0,003%	0,051%	0,006%	0,001%	0,104%	0,007%	0,006%
out	0,128%	0,072%	0,230%	0,033%	0,084%	0,006%	0,056%	0,150%	0,042%	0,086%	0,058%	0,067%	0,034%	0,047%	0,019%
desired	0,0002%	0,0001%	0,0002%	0,0001%	0,0003%	0,0000%	0,0005%	0,0001%	0,0000%	0,0002%	0,0000%	0,0001%	0,0004%	0,0002%	0,0001%
decided	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
loss	**0,130%**	**0,076%**	**0,238%**	**0,034%**	**0,087%**	**0,007%**	**0,068%**	**0,155%**	**0,045%**	**0,137%**	**0,064%**	**0,068%**	**0,138%**	**0,054%**	**0,026%**
								EMS Rule							
inf	0,002%	0,004%	0,008%	0,001%	0,003%	0,002%	0,016%	0,005%	0,003%	0,051%	0,006%	0,001%	0,104%	0,007%	0,007%
out	0,128%	0,075%	0,229%	0,037%	0,078%	0,006%	0,064%	0,150%	0,042%	0,086%	0,058%	0,070%	0,034%	0,049%	0,021%
desired	0,0006%	0,0004%	0,0006%	0,0004%	0,0005%	0,0005%	0,0007%	0,0005%	0,0005%	0,0006%	0,0005%	0,0004%	0,0008%	0,0005%	0,0004%
decided	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%	0,0005%
loss	**0,132%**	**0,081%**	**0,240%**	**0,040%**	**0,084%**	**0,010%**	**0,083%**	**0,158%**	**0,048%**	**0,140%**	**0,066%**	**0,074%**	**0,141%**	**0,059%**	**0,030%**

Figure 26: Root mean square between desired and decided interest rates for the initial Euroland

						(λ=0.2, v=0.5)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
EMS	0,00513	0,00635	0,00490	0,00752	0,00000	0,00450	0,01686	0,00458	0,00434	0,00960	0,00498
ECB	0,00347	0,00369	0,00314	0,00539	0,00420	0,00242	0,00944	0,00261	0,00207	0,00870	0,00317
NAT	0,00300	0,00277	0,00228	0,00545	0,00499	0,00157	0,01208	0,00185	0,00092	0,00876	0,00251
						(λ=1.0, v=0.5)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
EMS	0,01417	0,01524	0,01150	0,01908	0,00000	0,01077	0,03100	0,01115	0,00994	0,01505	0,01056
ECB	0,01024	0,00842	0,00731	0,01263	0,01023	0,00644	0,01678	0,00668	0,00472	0,01221	0,00583
NAT	0,00959	0,00620	0,00552	0,01360	0,01279	0,00486	0,01901	0,00530	0,00192	0,01193	0,00373
						(λ=1.0, v=0.25)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
EMS	0,02188	0,02324	0,01676	0,02706	0,00000	0,01596	0,04283	0,01632	0,01375	0,02227	0,01491
ECB	0,01688	0,01313	0,01136	0,01737	0,01460	0,01025	0,02180	0,01048	0,00676	0,01889	0,00863
NAT	0,01608	0,01003	0,00911	0,01899	0,01868	0,00837	0,02485	0,00888	0,00309	0,01873	0,00589
						(λ=5.0, v=0.5)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
EMS	0,03710	0,03707	0,02771	0,04527	0,00000	0,02765	0,06231	0,02764	0,02249	0,03201	0,02443
ECB	0,02942	0,02181	0,01961	0,02971	0,02281	0,01908	0,03233	0,01868	0,01140	0,02633	0,01427
NAT	0,02832	0,01623	0,01592	0,03331	0,02949	0,01606	0,03660	0,01634	0,00529	0,02561	0,00937
						(λ=1.0, v=1.0)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
EMS	0,00902	0,01009	0,00783	0,01294	0,00000	0,00748	0,02032	0,00748	0,00702	0,00973	0,00731
ECB	0,00631	0,00556	0,00464	0,00852	0,00687	0,00415	0,01106	0,00412	0,00317	0,00769	0,00375
NAT	0,00588	0,00403	0,00336	0,00919	0,00870	0,00301	0,01269	0,00312	0,00124	0,00752	0,00222
						(λ=1.0, v=5.0)					
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**
EMS	0,00304	0,00372	0,00276	0,00463	0,00000	0,00267	0,00739	0,00269	0,00265	0,00345	0,00270
ECB	0,00186	0,00205	0,00149	0,00308	0,00248	0,00131	0,00436	0,00135	0,00119	0,00256	0,00129
NAT	0,00163	0,00148	0,00098	0,00350	0,00307	0,00075	0,00507	0,00084	0,00041	0,00246	0,00061

Figure 27: Root mean square between desired and decided interest rates for the enlarged Euroland

								(λ=0.2,γ=0.5)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
EMS	0,00450	0,00578	0,00550	0,00605	0,00000	0,00383	0,01389	0,00419	0,00378	0,01102	0,00424	0,00671	0,02243	0,00741	0,00603
ECB	0,00287	0,00297	0,00415	0,00305	0,00409	0,00146	0,00725	0,00284	0,00140	0,01035	0,00231	0,00312	0,02183	0,00505	0,00363
NAT	0,00272	0,00262	0,00399	0,00280	0,00457	0,00101	0,00853	0,00267	0,00089	0,01031	0,00206	0,00263	0,02194	0,00495	0,00356
								(λ=1.0,γ=0.5)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
EMS	0,01225	0,01355	0,01360	0,01474	0,00000	0,00889	0,02437	0,01007	0,00863	0,01550	0,00900	0,01577	0,02377	0,01702	0,01207
ECB	0,00909	0,00690	0,01093	0,00722	0,00953	0,00333	0,01201	0,00759	0,00293	0,01320	0,00376	0,00749	0,02235	0,01162	0,00646
NAT	0,00888	0,00617	0,01070	0,00679	0,01117	0,00252	0,01330	0,00752	0,00189	0,01302	0,00305	0,00668	0,02228	0,01193	0,00622
								(λ=1.0,γ=0.25)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
EMS	0,01871	0,02028	0,02177	0,02178	0,00000	0,01256	0,03642	0,01570	0,01216	0,02247	0,01271	0,02363	0,03133	0,02633	0,01771
ECB	0,01466	0,01093	0,01853	0,01114	0,01375	0,00495	0,01723	0,01295	0,00440	0,01984	0,00553	0,01174	0,02901	0,01788	0,00972
NAT	0,01429	0,00984	0,01812	0,01103	0,01600	0,00393	0,01943	0,01277	0,00301	0,01966	0,00468	0,01057	0,02887	0,01807	0,00941
								(λ=5.0,γ=0.5)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
EMS	0,03281	0,03257	0,03651	0,03519	0,00000	0,02005	0,05242	0,02702	0,01939	0,03201	0,02019	0,03719	0,02914	0,04094	0,02711
ECB	0,02678	0,01708	0,03108	0,01725	0,02198	0,00804	0,02350	0,02306	0,00710	0,02718	0,00817	0,01795	0,02298	0,02780	0,01387
NAT	0,02650	0,01567	0,03076	0,01677	0,02588	0,00659	0,02630	0,02310	0,00499	0,02669	0,00680	0,01612	0,02245	0,02830	0,01307
								(λ=1.0,γ=1.0)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
EMS	0,00788	0,00944	0,00878	0,01050	0,00000	0,00611	0,01738	0,00669	0,00598	0,00961	0,00614	0,01100	0,01533	0,01199	0,00811
ECB	0,00552	0,00468	0,00686	0,00481	0,00681	0,00218	0,00808	0,00458	0,00196	0,00777	0,00233	0,00500	0,01392	0,00801	0,00398
NAT	0,00536	0,00424	0,00670	0,00445	0,00796	0,00149	0,00888	0,00455	0,00114	0,00763	0,00173	0,00445	0,01381	0,00814	0,00376
								(λ=1.0,γ=5.0)							
	AUS	**BEL**	**FIN**	**FRA**	**GER**	**IRE**	**ITA**	**LUX**	**NET**	**POR**	**SPA**	**DEN**	**GRE**	**SWE**	**UK**
EMS	0,00258	0,00348	0,00291	0,00400	0,00000	0,00232	0,00616	0,00237	0,00230	0,00370	0,00232	0,00399	0,00637	0,00405	0,00286
ECB	0,00156	0,00164	0,00198	0,00198	0,00247	0,00075	0,00321	0,00126	0,00069	0,00298	0,00074	0,00174	0,00589	0,00261	0,00124
NAT	0,00151	0,00146	0,00192	0,00192	0,00284	0,00044	0,00353	0,00120	0,00036	0,00294	0,00045	0,00153	0,00587	0,00260	0,00110