Monetary and Fiscal Policies in EMU

Interactions and Coordination

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8 Has EMU shifted monetary and fiscal policies?

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8.1 Introduction

The official adoption of the euro by eleven member states[1] of the European Union (EU) in January 1999 marked a key step in the process of economic and political integration in Europe. The significance of the event seems to have created a tendency to label as 'new' any aspect of EMU. This is certainly the case with its macroeconomic policy architecture, characterised by a single independent central bank on the monetary policy side, with a strict mandate to preserve price stability, and the Stability and Growth Pact setting behavioural guidelines for national authorities on the fiscal policy side. The resulting combination is commonly described as a completely new macroeconomic policy framework.

This chapter aims to assess the extent to which such a macroeconomic policy architecture represents a genuine policy-regime change.[2] To do that we use two decades of pre-EMU macroeconomic data to estimate forward-looking fiscal and monetary policy rules for the individual EU countries. The resulting rules provide a characterisation of the systematic and non-systematic components of macroeconomic policy behaviour before the formal start of EMU, which can then be compared with those implied by the EMU framework.

A distinctive feature of our empirical analysis is that it looks jointly at fiscal and monetary policy behaviour. We do this in contrast with the bulk of the policy rule literature, which has mainly focussed on monetary policy behaviour, and in the spirit of the holistic approach to macroeconomic policy analysis emphasised in the Fiscal Theory of the Price Level (Leeper, 1991; Sims, 1994; Woodford, 1994; Wren-Lewis, this volume, chapter 3). We use this theoretical framework to identify our characterisation of pre-EMU and EMU policy behaviour as representing a 'monetary dominance' regime. On this basis, the shift brought by EMU might not represent a drastic change in the conduct of economic policy

The views expressed are those of the authors and should not be attributed to the European Commission.

across Europe. In particular, our results suggest that the systematic part of policy behaviour could remain essentially unaltered. Other particularly relevant aspects of this chapter include the characterisation of fiscal behaviour, the extension of previous monetary rule results to a larger set of countries and a longer sample period, and the analysis of policy shocks.

The chapter is organised as follows. Section 8.2 reviews the case for simple policy rules in macroeconomic analysis, looking at key developments in the area during the last few decades. Section 8.3 describes the specification and estimation of the simple partial-adjustment forward-looking policy models used in the study. Section 8.4 contains the analysis and interpretation of the results. It first discusses the empirical relevance of the estimated rules. Then it identifies the pre-EMU policy regime. Next it briefly characterises the behaviour of the exogenous component of policy during the pre-EMU period. Finally, section 8.5 concludes by comparing pre-EMU policy behaviour with that prescribed by EMU.

8.2 The case for simple rules

The view that policy-making should be based on simple behavioural rules is not new, although its normative and empirical relevance have not been established until recently. The view dates back to at least the 1950s, when several proposals centred around money growth were suggested. The most well known of them is the fixed money growth rate rule put forward in Friedman (1959). Friedman's rule was based on the idea that long and variable lags of the effects of monetary policy could destabilise rather than stabilise the economy. Accordingly, his proposal conveyed two separate arguments: first, policy should follow a rule; and, second, it should favour a simple non-activist rule.

That rules are better than discretion is by now a widely accepted theoretical principle. The normative relevance of following rules rather than discretion was initially established by the pioneering work of Kydland and Prescott (1977). These authors formalised the notion of time inconsistency of optimal policy under discretion, showing how incentives to push output above potential will tend to create an inflationary bias under discretion. More recently, Clarida, Galí and Gertler[3] (1999) have shown that the time-inconsistency problem is relevant in a more realistic setting where the policy authority does not necessarily have a preference to push output above potential. They claim that, in order to obtain gains from commitment to a policy rule, it suffices that the current price-setting be dependent on future expectations about economic conditions. In such a framework, current inflation is a forward-looking variable that depends on expected inflation, so a credible policy commitment to respond to

future inflationary shocks will reduce expected inflation and will improve the short-run output–inflation trade-off, lowering inflation for any given output gap.

The time-inconsistency argument provides normative support for rules but not for simple *non-activist* rules, whose relevance, empirical or normative, has never been established. In fact, the recent proliferation of the analysis of simple policy rules has its origin in Taylor's (1993) proposal to use a simple *activist* rule as a guideline for monetary policy. Taylor's specific proposal was to use the following interest rate rule:

$$R_t^* = \alpha + \beta(\pi_{t-1} - \pi^*) + \gamma x_t; \qquad \beta > 1, \gamma > 0 \tag{1}$$

where '*' represents target values, R is the short-run nominal interest rate, π is the quarter-on-quarter yearly inflation rate, x is the output gap expressed as a percentage of target potential output, and $\alpha = \bar{r} + \pi^*$ is the long-run target nominal interest rate, with $\bar{r}$ representing the steady-state real interest rate.

The rule takes the short-run nominal interest rate as the monetary policy instrument and calls for an active policy that adjusts the nominal rate upwards (downwards) when inflation and output are above (below) target values. At the time, Taylor defended the normative relevance of this type of rule on the basis of simulation results obtained with (mainly) rational expectations econometric models, which suggested that rules with a direct focus on inflation and output targets tended to deliver more price and output stability than rules with a focus on money supply or exchange rate targets. Besides, he claimed that the rule was empirically relevant for the United States by informally setting the values:

$$\beta = 1.5, \gamma = 0.5, \bar{r} = 2, \pi^* = 2 \tag{2}$$

and showing that during the period 1987–92 the implied targeted interest rate was remarkably closed to the actual rate.

More recently, new research has reinforced the relevance of simple feedback rules of type (1). On the normative side, Taylor (1999) has collected simulation evidence from a wide variety of dynamic stochastic general equilibrium models (small and large, closed and open, with and without rational expectations, with different degrees of microeconomic foundations, estimated and calibrated) with some form of temporary nominal rigidities. One of his conclusions is that, in terms of output and inflation variance around targets, simple rules of type (1) tend to perform better across models than specific optimal rules, which tend to be very model-dependent.

Also on the normative side, CGG (1999) have analysed monetary policy in a stylised broad macroeconomic framework with temporary nominal price rigidities, where the monetary authority sets the interest rate

so as to minimise a quadratic loss function of inflation and output deviations from targets. In the list of general optimality principles obtained by these authors are the two characteristics embedded in rule (1), namely, that the interest rate has to adjust more than one-for-one with inflation ($\beta > 1$) and that it has to respond to the output gap (as opposed to the output level), so supply shocks (e.g. productivity shocks) that affect both potential and actual output must be accommodated (i.e. call for no action) whereas demand shocks that affect the gap call for counter-cyclical actions ($\gamma > 0$).

CGG (2000) have in addition made the point that the value of the parameter measuring the degree of response to deviations of inflation from target in policy rules of type (1) may be crucial for output and inflation stability. Specifically, they show that in their sticky-price theoretical framework, equilibrium is unique when the monetary rule embeds the optimality principle $\beta > 1$, but it is indeterminate, and so potentially more unstable, with $\beta \leq 1$. They then look at US data and estimate a β smaller than 1 for the pre-1979 sample and larger than 1 for the post-1979 sample. As the latter period is characterised by higher macroeconomic stability, the clear anti-inflationary policy of that period is seen as the potential stability factor.[4]

CGG (1998) have also reassessed the empirical relevance of simple interest rules by specifying and formally estimating for a set of major economies a forward-looking generalisation of rule (1). Their results confirm that Taylor's informal setting in (2) is reasonable, and show that the estimated target rates perform well in tracking the actual rates set by the respective central banks during the eighties and early nineties.

Overall, this recent literature (and the references therein) has tended to create what by now seems a wide consensus around the virtues of thinking about policy-making in terms of simple rules of type (1). It should be noted, however, that, as the description above suggests, the focus of the discussion in the literature has almost exclusively been on monetary policy with scant attention to fiscal policy, especially in the area of establishing the empirical relevance of simple rules. The only exceptions to our knowledge are Bohn (1998) and some informal work in Taylor (2000a), both for the United States.

8.3 Specification and estimation of the fiscal and monetary behaviour

8.3.1 Policy rules

A characteristic of rule (1) is the assumption that the monetary authority looks at lagged inflation in setting its policy instrument. The rationale for

the above-mentioned forward-looking generalisation of the Taylor rule recently proposed by CGG (1998, 2000) is that although policy-makers have, in effect, simple rules in mind, they generally look forwards, not backwards, using sophisticated methods to forecast their target objectives. As a consequence, target instruments are set according to a rule that focusses on expectations about deviations from target objectives rather than on past economic performance. Besides, inertia is pervasive in policy-making, implying that instruments will adjust slowly to their target values, which justifies the use of a partial adjustment mechanism to relate actual and target instruments.

CCG (1998, 2000) use this partial-adjustment forward-looking model to characterise monetary policy behaviour, but its principles are general enough to apply to fiscal policy behaviour as well. Thus, in this section we use such a type of model as the common framework to specify both fiscal and monetary policy rules.

Our fiscal rule specification takes the government primary surplus as the policy instrument and assumes that the fiscal authority sets its target for that instrument as a function of two economic indicators: the deviation of the inherited public debt from target and the expected output gap for the current year. Formally, we have:

$$s_t^* = \alpha_F + \delta_F(d_{t-1} - d^*) + \gamma_F E[x_t|\Omega_{Ft}] \tag{3}$$

where '*' represents target values, s and d are primary surplus and debt, respectively, both relative to the output level, E is the expectation operator, x is the output gap as a percentage of potential output, and Ω_{Ft} is the information set at the beginning of period t, when the fiscal authority sets its target.

There are theoretical arguments that can be used to justify specification (3). For instance, Bohn (1998) rationalises a similar equation by resorting to the Barro (1979) tax smoothing model, which provides a role for debt and cyclical variability in optimal tax setting. Or, in a different theoretical framework, Leeper (1991, 1993) and Andrés, Ballabriga and Vallés (2000, 2002) use rules like (3) in a calibrated dynamic stochastic model and show that they are helpful in eliminating equilibrium indeterminacy. However, these arguments notwithstanding, our favoured justification for (3) is plausibility. It is plausible because it provides a formal stylised way of explaining fiscal behaviour by focussing on two key dimensions of government concern, and it is therefore relevant for actual policy choices, namely, government solvency and output stabilisation.

It is true, on the other hand, that, although plausible, the rule may be seen as a too stylised representation. As we have mentioned, the policy process tends to have a strong inertia, which in the case of fiscal policy is probably explained to a large extent by the political difficulty of changing

past spending commitments and carrying out regular and recurrent drastic adjustments in tax codes. Besides, policy consists not only of endogenous reactions to economic evolution, as (3) suggests, but also of unexpected actions. Neither of these features (inertia and shocks) is captured by (3), which is why it may often turn out to be too simple to provide a good description of the actual variability of the policy instrument.

Thus, in order to gain empirical relevance, we introduced inertia and shocks in our specification through the following partial-adjustment model:

$$s_t = (1 - \rho_F)s_t^* + \rho_F s_{t-1} + v_{Ft} \tag{4}$$

where $0 \leq \rho_F \leq 1$. According to (4), the current value of the fiscal policy instrument partially adjusts from the value in the previous period towards the current government target by a fraction of $(1 - \rho_F)$. Besides, the value of the instrument is affected by a zero-mean i.i.d. shock v_F, which reflects the effect of non-systematic actions. More specifically, v_F may incorporate variability stemming from the imperfect control of the fiscal process (e.g. 'political' shocks) or true fiscal policy actions, that is, genuine discretionary policy shocks.

Equations (3) and (4) define our model of fiscal policy behaviour.

CGG (1998) have documented how the leadership exerted by the Bundesbank in the European monetary policy process translates into a significant empirical relevance of the German interest rate for the evolution of the rates in the largest European economies. The monetary rule specification that we consider takes this asymmetry directly into account. Thus, the rule takes the short-run nominal interest rate as the policy instrument and assumes that, in the case of Germany, the monetary authority sets the target for that instrument as a function of expected deviations from inflation and output targets. The rest of the EU countries look in addition to the German rate when setting their instrument target. Formally, for Germany:

$$R_t^* = \alpha_M + \beta_M E[\pi_{t+k} - \pi^*|\Omega_{Mt}] + \gamma_M E[x_t|\Omega_{Mt}] \tag{5}$$

and for the rest of the EU countries:

$$R_t^* = \alpha_M + \beta_M E[\pi_{t+k} - \pi^*|\Omega_{Mt}] + \gamma_M E[x_t|\Omega_{Mt}] + \lambda_M R_t^D \tag{6}$$

where R is the short-run nominal interest rate, π_{t+k} is the inflation rate k periods ahead, the relevant horizon for the monetary authority, R^D is the German short-run nominal rate, and as above '*' represents target values, x is the output gap, and expectations are conditional on the information set available at the beginning of period t, when target rates are set. The empirical and theoretical rationale for this kind of interest rate rule has already been documented in section 8.2.

As in the case of fiscal policy, these monetary target rules are generally too stylised, as they lack inertia and the effect of exogenous disturbances. In the case of monetary policy, inertia is often justified by the observed tendency of central banks to smooth interest rate changes.[5] On the other hand, exogenous shocks may be the consequence of failures to follow the rule (e.g. political pressure on the central bank) or the result of true discretionary monetary policy actions. As with fiscal policy, we introduce these two features into the analysis together through the following partial-adjustment equation:

$$R_t = (1 - \rho_M)R_t^* + \rho_M R_{t-1} + v_{Mt} \tag{7}$$

where $0 \leq \rho_M \leq 1$ measures the degree of smoothing and v_M is the zero-mean i.i.d. exogenous component of policy.

Equations (5), (6) and (7) define our model of monetary policy behaviour.

8.3.2 *Estimation*

Ready-for-estimation versions of the fiscal and monetary policy rules are obtained by rewriting (3) and (5)–(6) in terms of realised variables and their corresponding forecasting errors and combining them, respectively, with (4) and (7). The resulting expression for the fiscal rule is:

$$s_t = (1 - \rho_F)\tilde{\alpha}_F + (1 - \rho_F)\delta_F d_{t-1} + (1 - \rho_F)\gamma_F x_t + \rho_F s_{t-1} + \varepsilon_{Ft} \tag{8}$$

with

$$\tilde{\alpha}_F = \alpha_F - \delta_F d^*$$
$$\varepsilon_{Ft} = -(1 - \rho_F)\gamma_F(x_t - E[x_t|\Omega_{Ft}]) + v_{Ft}$$

Similarly, the monetary policy model results in the following expressions for Germany and the rest of the EU, respectively:

$$R_t = (1 - \rho_M)\tilde{\alpha}_M + (1 - \rho_M)\beta_F \pi_{t+k} + (1 - \rho_M)\gamma_M x_t + \rho_M R_{t-1} + \varepsilon_{Mt} \tag{9}$$

and

$$R_t = (1 - \rho_M)\tilde{\alpha}_M + (1 - \rho_M)\beta_F \pi_{t+k} + (1 - \rho_M)\gamma_M x_t + (1 - \rho_M)\lambda_M R_t^D + \rho_M R_{t-1} + \varepsilon_{Mt} \tag{10}$$

with

$$\tilde{\alpha} = \alpha_M - \beta_M \pi^*$$
$$\varepsilon_{Mt} = -(1 - \rho_M)(\beta_M(\pi_{t+k} - E[\pi_{t+k}|\Omega_{Mt}]) + \gamma_M(x_t - E[x_t|\Omega_{Mt}])) + v_{Mt}$$

In all cases the error term is a combination of forecasting errors and a zero-mean i.i.d. exogenous policy shock v.

The policy equations are estimated by non-linear GMM for the sample period 1979–98.[6] We use annual data for fiscal policy and quarterly data for monetary policy, time frames that reflect reasonably well those of actual policy choices in each branch of macro policy-making. We assume that the monetary authority looks at one-year-ahead expectations for inflation when assessing deviations from target, so we set $k = 4$. For comparability with CGG (1998), the set of instruments for monetary policy includes four lags of all the variables in equations (9) and (10) and four lags of the rates of change of the effective real exchange rate and of the commodity prices, but in addition we also include money growth as an instrumental variable when complete sample series are available. Similarly, the set of instruments for fiscal policy includes one lag of all the variables in equation (8) plus one lag of the short-run nominal interest rate, and the rates of change of the effective real exchange rate and the commodity price indicator. In both cases, fiscal and monetary, the dimension of the vector of instruments exceeds the dimension of the vector of parameters, so testing for over-identification provides a way to assess the empirical relevance of the models.

8.4 Analysis and interpretation of the results

8.4.1 *The empirical relevance of the rules*

Fiscal rule A look at table 8.1 reveals the satisfactory statistical properties of the fiscal model. Considering the overall specification, the value of the $\mathcal{J}$-statistic implies for all countries that the model is not rejected by the data at conventional significance levels. Turning to the statistical significance of the coefficients, note first that the partial-adjustment coefficient is significant for most countries (the exceptions are Austria, France, the Netherlands and Portugal) and is in the range [0.47, 0.87], implying a considerable degree of policy inertia. The inertia seems especially high in Ireland (0.87) and the UK (0.84).

The rest of the coefficients are also statistically significant in most cases. Specifically, all countries except Sweden respond to the accumulation of

Table 8.1. *Fiscal policy rules, 1979–98*[1]

	ρ_F	α_F	δ_F	γ_F	σ^2	$\mathcal{J}^3$
Austria		−1.29	0.04	0.24	0.78	2.44
		(0.67)*	(0.01)*	(0.04)*		[0.66]
Belgium	0.47	−12.8	0.14	0.34	1.04	3.68
	(0.13)*	(1.66)*	(0.02)*	(0.12)*		[0.24]
Denmark	0.49	−0.75	0.10	1.14	1.32	6.03
	(0.10)*	(0.99)	(0.02)*	(0.15)*		[0.11]
Finland	0.47	2.19	0.04	0.92	1.04	1.99
	(0.06)*	(0.42)*	(0.02)*	(0.08)*		[0.58]
France		−0.17	0.02	0.26	0.52	4.53
		(0.32)	(0.01)*	(0.04)*		[0.34]
Germany	0.54	−2.01	0.08	−0.09	0.90	6.32
	(0.16)*	(1.34)	(0.04)*	(0.12)		[0.10]
Ireland[4]	0.87	−31.0	0.38	0.20	1.17	2.70
	(0.08)*	(17.0)	(0.20)	(0.55)		[0.44]
Italy	0.58	−14.5	0.16	0.06	1.13	1.08
	(0.10)*	(1.85)*	(0.02)*	(0.13)		[0.78]
The Netherlands		−3.69	0.08	0.24	1.00	1.43
		(0.58)*	(0.01)*	(0.09)*		[0.84]
Portugal		−20.0	0.35	0.05	1.40	3.81
		(2.40)*	(0.04)*	(0.02)*		[0.43]
Spain	0.50	−4.90	0.09	0.33	0.91	3.69
	(0.14)*	(0.95)*	(0.02)*	(0.10)*		[0.30]
Sweden	0.62	−0.86	0.08	1.46	1.67	6.05
	(0.06)*	(4.02)*	(0.07)	(0.21)*		[0.11]
United Kingdom	0.84	−49.6	1.04	1.05	1.04	6.49
	(0.05)*	(18.8)*	(0.39)*	(0.63)		[0.09]

Notes: Standard errors, in parentheses, are heteroscedastic-consistent and also robust to autocorrelation.

*Significant at 5 per cent.

[1]Except for Portugal, where the sample period is 1982–98.

[2]Standard error of the regression.

[3]Test for overidentifying restrictions (chi-square with three degrees of freedom); p-values in brackets.

[4]The p-values associated with α_F and δ_F are 0.07.

debt by increasing the primary surplus. Although the samples are not directly comparable, the estimated response of the primary surplus to the stock of debt is in most cases within the 95 per cent confidence intervals for estimates in tables I and III of Bohn (1998). Leaving aside Sweden, the most outstanding exceptions are the UK and Ireland, where the estimated coefficients are very large, although in the latter country the p-value associated with the coefficient is 0.07. The estimated response to

the output gap is also mostly significant (Germany, Ireland, Italy and the UK are the exceptions) and has the expected positive sign, implying that fiscal policy behaviour is counter-cyclical. Finally, it is worth mentioning the generally negative (except Finland) and significant (except in France, Germany and Sweden) constant term. Recall that in $\tilde{\alpha_F} = \alpha_F - \delta_F d^*$, α_F represents the long-term primary surplus target or, in other words, the desired surplus when both debt and output gap are at their target values (see expression (3)). Thus, if we reasonably assume that $\alpha_F \approx 0$ and the target debt d^* is correlated with actual debt ratios, we would expect a negative $\tilde{\alpha_F}$ higher in absolute value for high-debt countries. Such an absolute value should also be higher in countries with a larger response of the primary surplus to debt δ_F. This turns out to be the case in table 8.1. For low estimated values of δ_F, $|\tilde{\alpha_F}|$ is overall higher for countries with higher average debt ratios during the sample period analysed, while it is also very high in Ireland, Portugal and the UK, where the responses to government debt are the largest in the panel of countries.

Additional evidence regarding the relevance of the estimated rule in describing actual fiscal behaviour can be obtained by making the standard comparison between the actual and model-implied target values for the primary surplus (see expression (3)), which provides a test of the empirical 'tracking' ability of the estimated target rule for the policy instrument. This is done in figure 8.1. As can be seen, except in the cases of Ireland and the UK, the target equation traces reasonably well the evolution of the actual surplus, although some temporary deviations occur. In particular, the German deviation from the target in 1990, the year of reunification, is clearly visible, as are its fiscal difficulties in the mid-nineties. It is also worthwhile mentioning the consolidation effort in most member states during 1997 and 1998, the pre-selection period for participation in EMU, when the surplus was following an upward trend across the EU.[7] However, if we naturally measure the effort in terms of the difference between the actual surplus and that required by the target rule, we can clearly see that fiscal consolidation was particularly strong in a number of future EMU members, such as Belgium, Ireland, Italy, the Netherlands and Austria. In contrast, during the same period, the implied target surplus was above the actual in those countries (Denmark, Sweden and the UK) that, for different reasons, had already decided not to adopt the single currency.

A last and specific mention is needed for Ireland and the UK. In both cases the evolution of the estimated target instrument turns out to be mostly driven by the accumulation of debt, which varies considerably through the sample period and to which they respond relatively strongly, as highlighted above. This fact in combination with their high policy

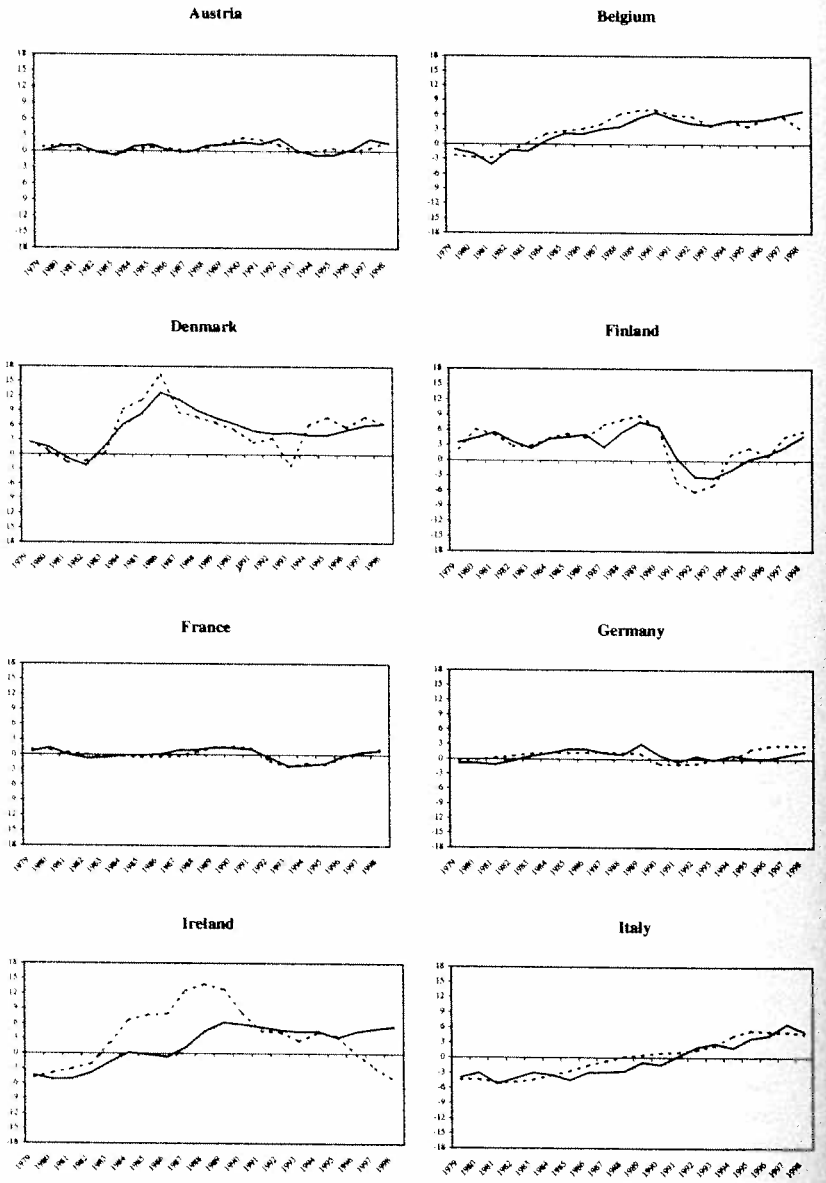

Figure 8.1. Actual and target government primary surplus (% of GDP).

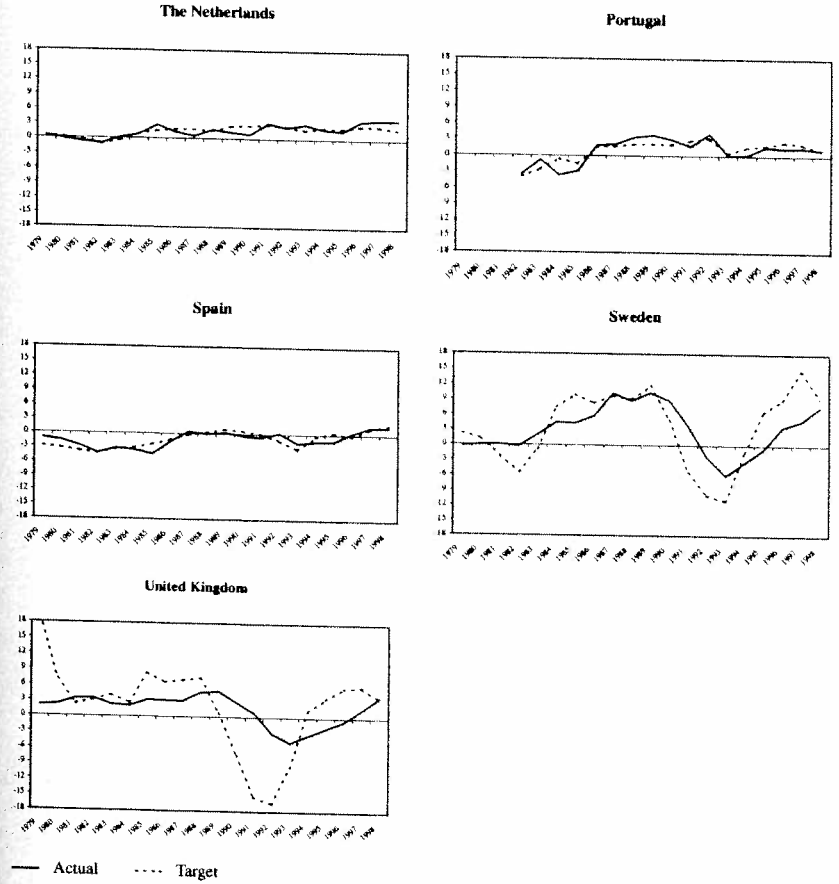

Figure 8.1. (*cont.*).

inertia coefficients implies that the deviations between actual and target instrument values tend to be large in both countries.

Monetary rule Turning now to the results obtained for the monetary rule (table 8.2), a first general point to emphasise is that they reproduce for our extended sample period and panel of EU countries the overall results reported in CGG (1998) for the four largest European economies (Germany, France, the UK and Italy).[8]

The rule seems to provide a satisfactory description of monetary policy behaviour, with its specification being accepted for all the countries

Table 8.2. *Monetary policy rules, 1979Q1–1998Q4*[1]

	ρ_M	α_M	β_M	γ_M	λ_M	σ^2	$\mathcal{J}^3$
Austria[4]	0.62	0.87	0.21	0.33	0.76	0.54	21.0
	(0.08)*	(0.34)*	(0.14)	(0.10)*	(0.08)*		[0.40]
Belgium[5]	0.74	0.65	0.47	0.16	0.79	0.65	23.9
	(0.04)*	(0.41)	(0.16)*	(0.11)	(0.11)*		[0.46]
Denmark[5]	0.75	−2.91	0.68	0.95	1.54	1.75	20.0
	(0.05)*	(1.26)*	(0.20)*	(0.27)*	(0.28)*		[0.70]
Finland[4]	0.93	2.56	1.63	−0.53	−0.23	1.11	10.7
	(0.02)*	(2.98)	(0.58)*	(0.71)	(0.73)		[0.95]
France[5]	0.88	1.46	0.52	1.54	0.65	0.89	19.1
	(0.03)*	(1.37)	(0.16)*	(0.64)*	(0.26)*		[0.75]
Germany[5, 6]	0.87	2.53	1.29	1.00		0.46	19.6
	(0.02)*	(0.43)*	(0.16)*	(0.21)*			[0.55]
Ireland[5]	0.65	3.11	0.53	0.35	0.66	2.20	16.9
	(0.05)*	(0.78)*	(0.09)*	(0.11)*	(0.14)*		[0.85]
Italy[4]	0.92	−1.67	0.60	0.85	1.37	0.94	19.0
	(0.03)*	(3.30)	(0.23)*	(0.66)	(0.58)*		[0.52]
The Netherlands[4]	0.55	0.23	−0.07	0.48	1.0	0.64	22.0
	(0.03)*	(0.30)	(0.08)	(0.09)*	(0.05)*		[0.34]
Portugal[4]	0.77	−0.43	0.22	0.03	1.52	1.77	15.2
	(0.05)*	(1.35)	(0.08)*	(0.05)	(0.27)*		[0.76]
Spain[5]	0.82	2.77	0.62	0.79	0.67	1.91	22.9
	(0.05)*	(1.56)	(0.20)*	(0.40)*	(0.28)*		[0.53]
Sweden[5]	0.53	2.73	0.08	0.33	1.05	1.73	21.0
	(0.09)*	(0.89)*	(0.09)	(0.10)*	(0.15)*		[0.58]
United Kingdom[4]	0.85	1.29	0.52	1.20	0.86	1.20	25.3
	(0.03)*	(1.24)	(0.21)*	(0.36)*	(0.26)*		[0.19]

Notes: Standard errors, in parentheses, are heteroscedastic-consistent and also robust to autocorrelation.

*Significant at 5 per cent.

[1]The sample size is 80, except in Belgium (size 68; period 1982Q1–1998Q4), Ireland (76; 1980Q1–1998Q4) and Portugal (68; 1982Q1–1998Q4).

[2]Standard error of the regression.

[3]Test for overidentifying restrictions (chi-square with 20 degrees of freedom in countries lebelled [4], 24 in countries labelled [5] and 21 in Germany); *p*-value in brackets.

[4]Sufficiently long series of money growth not available. Excluded from the set of instruments.

[5]Money growth in the set of instruments.

[6]The policy instrument equation only includes expected inflation and the output gap. See equation (5).

analysed according to the $\mathcal{J}$-test at conventional significance levels. As for the coefficients and their statistical significance, the degree of policy inertia is high, ranging in the interval [0.53, 0.93]. The monetary authority responds significantly to expected deviations from target for domestic inflation by increasing rates in most countries (except in Austria, the Netherlands and Sweden), with a coefficient value of 1.29 for Germany and in the interval [0.22, 0.68] for the rest of the countries (except for Finland with 1.63). Besides, the external constraint imposed by the evolution of the German rate is clearly reflected by its pervasive significant positive effect on the rates of the rest of the EU countries, except Finland. This gives formal empirical support to the conventional view regarding the leadership exerted by Germany in the setting of European monetary policy during the eighties and nineties. Finally, in terms of the tracking ability of the target interest rates, the estimated model performs reasonably well, as shown in figure 8.2. The only exceptions are Finland and the first half of the sample period in Italy. In the case of Italy, the high inflation variability of the eighties combines with a relatively high degree of interest rate smoothing to induce large deviations between the actual and estimated target rates. A similar argument applies in Finland, where in addition the especially turbulent episodes of the early nineties (the Soviet bloc's disintegration and financial crisis) operate to generate large deviations in the second part of the sample as well. Leaving aside these cases, some particular temporary deviations are clearly visible, such as the one observed in the UK at the time of the exceptionally large inflationary spike of 1980.

In addition to the above general comments, two other aspects of the monetary rule results deserve emphasis. First, as is clear from figure 8.2, the rule tends to provide a better description of policy behaviour during the 1990s, a decade characterised by lower inflation variability. One plausible interpretation of this fact is obtained by applying the argument used above for Finland and Italy, namely that policy inertia combines with the higher macroeconomic turbulence of the 1980s to generate larger deviations of actual from target rates. In the 1990s, the Maastricht criteria, especially those referring to inflation and interest rates, by establishing clear targets for the central banks, introduced an additional factor of monetary discipline.

Second, the coefficient of the output gap is positive and significant in most countries (except in Belgium, Finland, Italy and Portugal), and its estimated value is in the interval [0.33, 1.63]. This result implies that monetary policy is generally counter-cyclical and, taking standard errors into account, it suggests that the response of the monetary authority to expected output fluctuations seems to be stronger on average than reported in CGG (1998).[9]

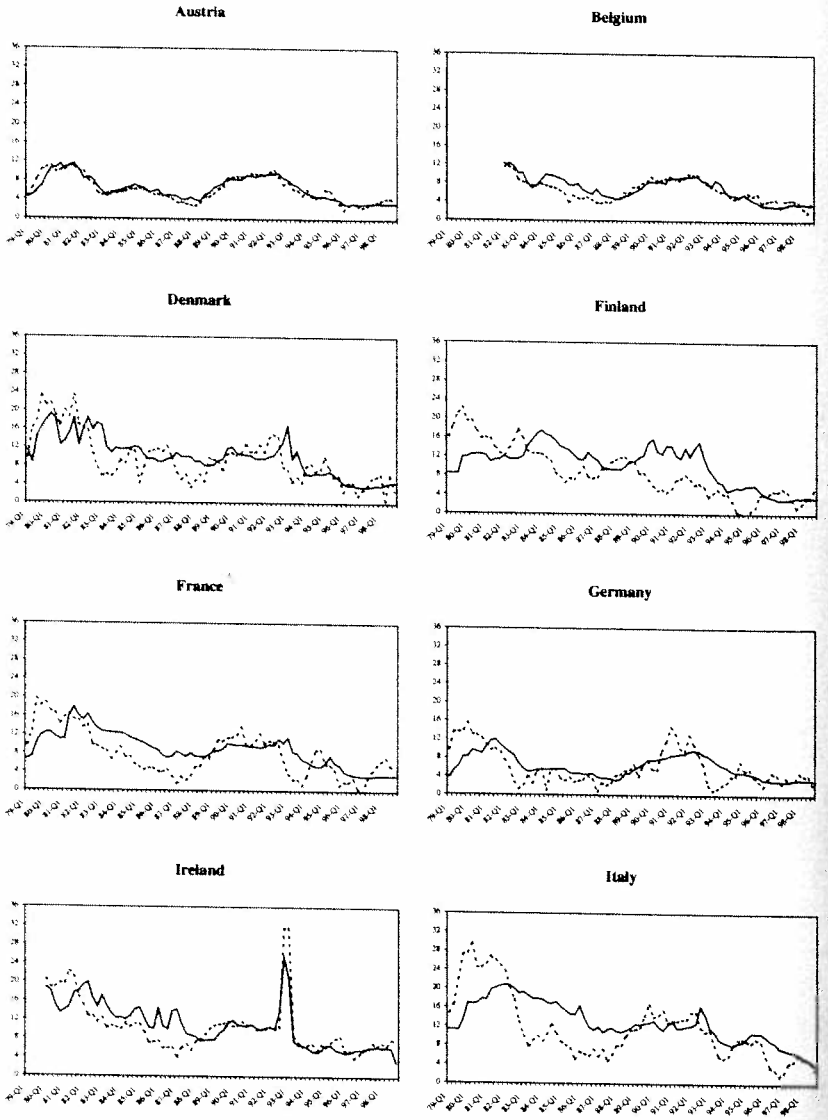

Figure 8.2. Actual and target short term interest rates.

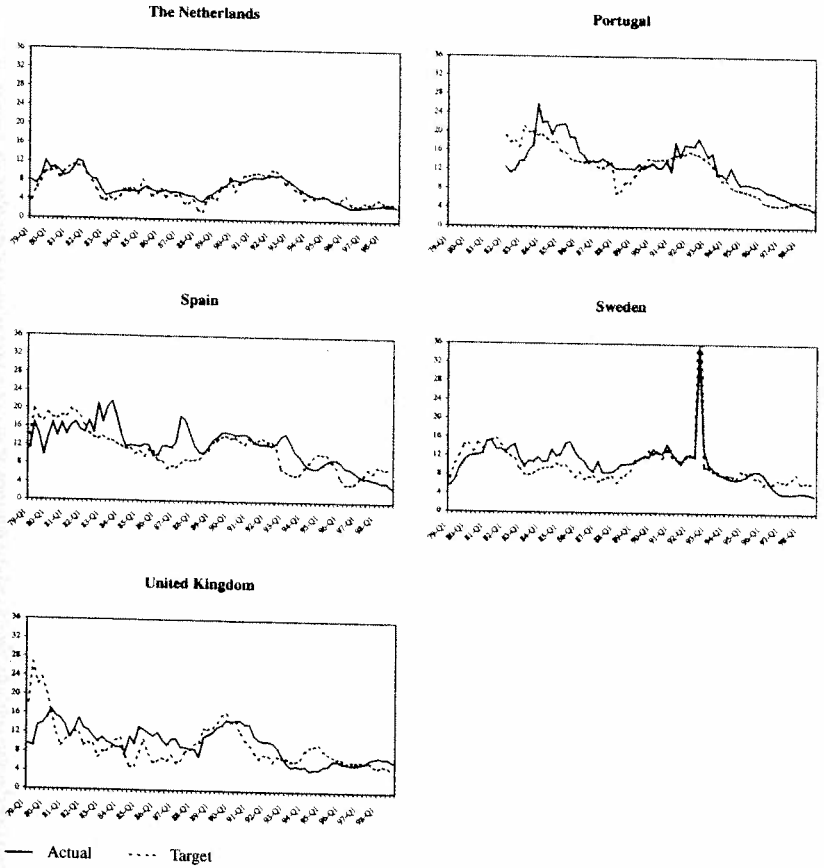

Figure 8.2. (*cont.*).

8.4.2 *The policy regime during the twenty pre-EMU years*

A policy regime is defined by a specific combination of fiscal and monetary policy behaviour. The need to look simultaneously at both branches of macro policy in order to characterise a policy regime correctly is often recognised in public debates, as for instance in the debates about EMU. This stands in sharp contrast with traditional economic analysis, which, with few exceptions,[10] has studied them separately.

Since monetary and fiscal policy are closely connected, any positive or normative conclusion about one branch of policy depends on

assumptions about the behaviour of the other branch. When the two are analysed separately those assumptions are not explicitly spelt out, thereby giving a misleading sense of the generality of the conclusions and making it difficult to identify the specific policy regime under scrutiny.

In recent literature, a holistic approach to macroeconomic policy analysis has been proposed that represents a challenge to traditional economic analysis and views about the role of monetary and fiscal policies. It is known as the Fiscal Theory of the Price Level (FTPL) and was originally proposed by Leeper (1991), Sims (1994) and Woodford (1994).[11] FTPL models look simultaneously at fiscal and monetary behaviour, combining a traditional monetary sector with the explicit formulation of the long-run solvency condition for the fiscal sector, which requires that the current stock of debt equals the discounted flow of future primary surpluses. A key question in these models is how fiscal solvency is achieved. The fiscal authority itself may guarantee solvency. This will happen when it observes discipline and sets its primary surplus sequence in accordance with the solvency condition. In such a case, fiscal policy is said to be 'passive' or 'Ricardian'. Alternatively, fiscal behaviour may lack discipline and set primary surpluses that are not compatible with solvency. In this case, fiscal policy is said to be 'active' or 'non-Ricardian', and the endogenous adjustment of the price level is required to guarantee that fiscal solvency is achieved. A corresponding terminology is used for monetary policy. It is called 'active' when the monetary authority effectively counteracts inflation by implementing a policy that induces an increase in the real interest rate when inflationary pressures increase, and vice versa. Otherwise, monetary policy is termed 'passive'.

The discussion under the FTPL framework has been helpful for identifying and analysing different policy regimes. A specific policy regime is explicitly defined as a combination of fiscal and monetary behaviour that delivers a unique stable equilibrium. The two most widely discussed are the so-called 'monetary dominance' (MD) and 'fiscal dominance' (FD) regimes. The MD regime is identified by a combination of an active monetary policy and a passive fiscal policy, whereas the FD regime combines a passive monetary policy with an active fiscal policy. Interestingly, this analysis of policy regimes has often been made with models where policy is represented using simple feedback rules of the type we have estimated, with different parameter value combinations defining different regimes. This, we next claim, provides a way to characterise empirically the policy regime that has prevailed in our panel of EU countries during the sample period analysed.

As the FTPL literature has pointed out,[12] the empirical discrimination among policy regimes, and in particular between MD and FD regimes,

is not straightforward. The reason is that simply designing a test for fiscal solvency, as it might first come to mind, will not lead to conclusive results. As we have mentioned, the violation of the solvency condition is not what characterises an FD regime. In equilibrium, the fiscal solvency condition holds under both MD and FD. The difference between the two regimes lies in how solvency is achieved: through endogenous price adjustment under FD and through endogenous primary surplus adjustment under MD.

However, as Woodford (1999, 2001a) has argued, empirical evidence on monetary and fiscal indicators may be reasonably interpreted as being generated by a specific policy regime if one looks at the joint structural behaviour of fiscal and monetary policy, as the FTPL framework suitably allows. As we have just mentioned, policy analysis in FTPL models has used the same type of structural policy rules that we have specified[13] to investigate the parameter combinations that deliver a unique stable equilibrium and, therefore, lead to clear-cut predictions regarding policy effects. Each of such parameter combination identifies a policy regime. More specifically, using a broad underlying macroeconomic framework, this line of research has identified the response of monetary policy to inflation deviations from target (β_M) and the response of the fiscal authority to the stock of debt (δ_F) as the key parameters to obtain unique stable equilibria.[14] In particular, an active monetary policy ($|\beta_M| > 1$) in combination with a passive fiscal policy ($|1 - \delta_F| < 1$) delivers uniqueness, defining an MD regime, whereas a passive monetary policy ($|\beta_M| < 1$) combined with an active fiscal policy ($|1 - \delta_F| > 1$) defines an FD regime.[15]

The immediately interesting question at this point is whether we can identify a policy regime for the countries in our panel on the basis of the estimated policy rules. Focus first on the monetary rule: does it implies that monetary policy has been active? Certainly 'yes' for the case of Germany, where the inflation coefficient is clearly greater than 1, and also in Finland. However, the answer is less straightforward for the rest of the countries. The dominant role of Germany during our sample period has imposed a strong external constraint on the monetary policy of these countries, implying that the empirical specification of their monetary rules does not conform with the available theoretical analysis of stability. Thus, the fact that their estimated coefficients for domestic inflation are less than 1 is not sufficient to infer that monetary policy has been passive, because the evolution of the German rate also exerted influence on the setting of nominal interest rates across the European central banks.

To get around this problem, we perform a counter-factual experiment inspired by CGG (1998). Specifically, we ask whether during the two decades of our sample the rest of the EU countries implemented a

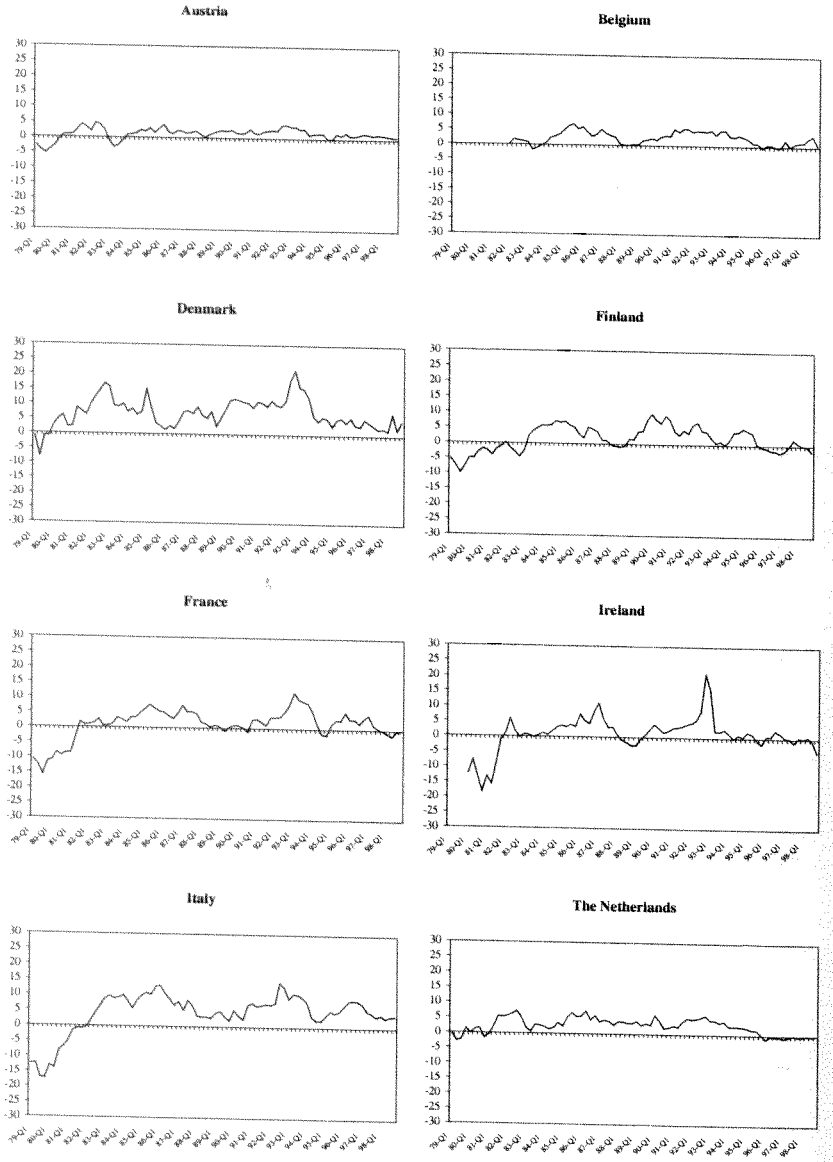

Figure 8.3. Different between actual and counter-factual short-term interest rates.

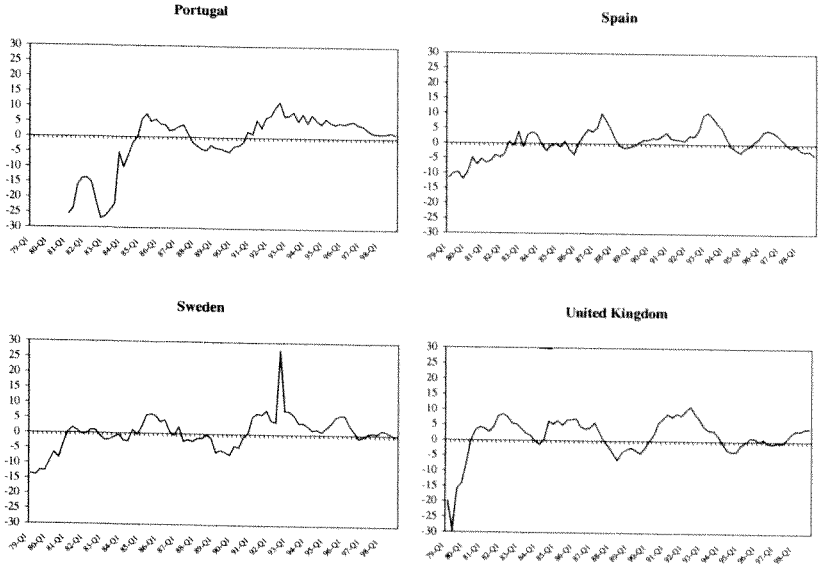

Figure 8.3. (*cont.*).

monetary policy as active as a German type of rule would have implied. Thus, for each country, we drop the German rate in the target rule (6) and set the inflation coefficient equal to the value estimated for Germany (1.29). However, we keep the respective estimates of the intercept and the response to output gap, as they depend on the specific structural features of the country. On the basis of this hypothetical monetary rule we simulate the implied interest rate for the series of inflation and output gap actually observed in the country. In doing so, we build a benchmark active rule, which can be compared with the policy behaviour actually observed over the sample period. Figure 8.3 plots the difference between observed and simulated interest rates. A positive difference between the rates indicates that the actual monetary policy in the country has been tighter than it would have been if the hypothetical rule described above had been applied. As can be seen, in all countries and on average over the sample, actual monetary policy, as represented by the observed interest rates, has been similar to, or even tighter than, that implied by the benchmark active rule, with the stress of the European Monetary System (EMS) crisis in the early nineties clearly visible. We therefore claim that monetary policy has been active in all EU countries.

Given an active monetary policy, and assuming that one favours the interpretation of the evidence in figure 8.3 as representing a unique stable equilibrium in each country, we could infer that fiscal policy must have been passive during our sample period. In fact, this is what our estimation results for the fiscal rule suggest (see table 8.1): the response to debt accumulation is significantly different from zero (except Sweden), and lies in all cases within the theoretical interval $|1 - \delta_F| < 1$, which places the economies in the MD region of stability. As Bohn (1998) has shown, a greater than zero response to debt accumulation is a sufficient condition for solvency, independently of the relative evolution of interest rates and output growth.

So we conclude that policy discipline is pervasive in our sample, and that the evidence can reasonably be interpreted as supporting the prevalence of a monetary dominance policy regime during the two pre-EMU decades.

8.4.3 *Policy shocks during the twenty pre-EMU years*

Our characterisation of policy behaviour has two basic components. One is the systematic component, which is represented by the part of the rule that describes the elements of inertia and the endogenous response of the policy authority to past (debt) or expected (inflation, output gap) economic variables. The other one is the set of non-systematic actions represented by the random component of the policy rule. So far we have focussed on the systematic component of policy. For the sake of completeness, this section briefly looks at some empirical characteristics of the non-systematic policy actions.

As we argued in section 8.3, and formally reflected in expressions (8), (9) and (10), the random component of our estimated rules is a mixture of sources of variability including (*a*) errors in forecasting the policy target variables, (*b*) the imperfect control of the policy process, and (*c*) true discretionary policy actions. Thus, interpreting this component of the rule as reflecting discretionary policy shocks requires caution. One could argue that the contribution of forecasting errors may be negligible because they are buffered by the high policy inertia and because offsetting effects between errors of different sign may occur. Assuming then that source (*b*) is either exceptional or of low relative variability, we could think of the non-systematic component as mainly reflecting source (*c*).

With these caveats in mind, we have used the estimated policy rules residuals to compute the contemporaneous correlation between monetary and fiscal policy shocks within and across countries.[16] We have also computed standard deviations for the whole sample, the 1980s and the 1990s to measure non-systematic variability and its changes over the sample period (table 8.3).

Table 8.3. *Standard deviations of policy shocks*

	Fiscal			Monetary		
	Whole Sample (79–98)	1980s (79–89)	1990s (90–98)	Whole Sample (79–98)	1980s (79–89)	1990s (90–98)
Austria	0.738	0.496	0.992	0.365	0.443	0.167
Belgium	0.952	0.892	1.029	0.377	0.404	0.289
Denmark	1.203	0.991	1.487	0.821	1.053	0.414
Finland	0.939	1.209	0.499	0.540	0.614	0.457
France	0.472	0.568	0.345	0.433	0.489	0.278
Germany	0.795	0.775	0.823	0.282	0.329	0.176
Ireland	1.066	1.084	1.093	1.481	1.207	1.686
Italy	1.039	0.978	1.154	0.425	0.261	0.542
The Netherlands	0.940	0.728	1.132	0.407	0.409	0.187
Portugal	1.263	1.629	0.849	0.671	0.866	0.468
Spain	0.832	0.867	0.833	0.904	1.110	0.540
Sweden	1.529	1.713	1.313	1.110	0.944	0.933
United Kingdom	0.956	0.906	0.954	0.516	0.569	0.397

Note: Standard deviations are based on the residuals from models in tables 8.1 and 8.2. Quarterly residuals in the monetary rules have been annualised by taking arithmetic averages over the year.

To the extent that our residuals can be interpreted as mainly representing discretionary policy actions, the following empirical facts regarding non-systematic policy behaviour arise from the analysis:

(i) Fiscal and monetary policy shocks are uncorrelated within each country.
(ii) Fiscal policy shocks are uncorrelated across countries.
(iii) Monetary policy shocks are uncorrelated across countries, except for some relatively high correlation among countries traditionally included in the former Deutschmark area, particularly Belgium and the Netherlands, and also between France and Germany.
(iv) Fiscal policy shocks display significantly higher variability than monetary policy shocks (except in Ireland, where it is lower, and in Spain and France where it is similar).
(v) Relative to the1980s, the volatility of monetary policy shocks generally decreased in the 1990s (Italy, Ireland and Sweden are the exceptions), whereas no clear pattern arises for fiscal shocks over the two sub-periods.

These facts signal two potential characteristics of the non-systematic component of economic policy during the pre-EMU period that deserve to be emphasised. First, as (iii) suggests, fiscal and monetary policies may have acted as independent stabilisers and as potential sources of

asymmetric macroeconomic variability. Second, while it is probably true that fact (v) is explained by the policy constraints imposed during the nineties by the Maastricht criteria for participation in the third stage of EMU,[17] fact (iv) suggests that, over the sample period, non-systematic actions may have been taken much more frequently by fiscal authorities than by the central banks.

8.5 Conclusion: the extent of EMU policy shift

The macroeconomic institutional architecture of EMU has two basic components. On the one hand, a single independent central bank (the ECB) is in charge of conducting monetary policy, with the strong mandate of preserving price stability, explicitly defined as an inflation rate below 2 per cent over the medium term. On the other hand, the Stability and Growth Pact constrains the behaviour of the various independent national governments in conducting fiscal policy. The SGP calls for 'close-to-balance or in-surplus' medium-term budgetary positions, and requires that, leaving aside exceptional circumstances, national budget deficits never go above the explicit upper limit of 3 per cent of GDP. The SGP is seen as a mechanism to guarantee that public finances in EMU are sound, thus providing a fiscal environment in which the ECB can effectively maintain price stability.

The usual way to refer to this institutional macroeconomic architecture is to say that it represents a unique historical development that has brought a genuine regime change for macroeconomic policy. Is this what our empirical results suggest? We would say that, on the basis of the results presented here, the potential regime change seems less drastic than anticipated at the outset of the third stage of EMU. To see why, let us cast the institutional description of EMU in terms of the policy rule framework used in this study, keeping in mind that the relevant price is now the euro-area price level.[18]

With regard to monetary policy, the ECB mandate calls for effective countering of inflationary pressures. This implies that when the ECB expects inflation to deviate from target it must adjust its target instrument strongly enough to affect the real interest rate in the appropriate direction. This is what we have called in subsection 8.4.2 an 'active' monetary policy. As for fiscal policy, the SGP objective is that fiscal discipline prevails so that governments guarantee their own solvency. The medium-term close-to-balance-or-in-surplus condition, albeit not a necessary one, is sufficient to keep the stock of debt under control in the medium run. Thus, using subsection 8.4.2 terminology, the Pact calls for fiscal policy to be 'passive' in member states. As we have pointed out, the combination

of an active monetary policy and a passive fiscal policy identifies a 'monetary dominance' policy regime, which therefore provides an accurate description of the EMU regime.

As discussed in section 8.4, this is precisely the regime that we claim prevailed during the twenty pre-EMU years. This implies that the key characteristics of the systematic component of macroeconomic policy in EMU may not be different from what they used to be. Both pre-EMU and EMU policy regimes can be characterised as 'monetary dominance' regimes, and in this essential sense they are alike.

Beyond this formal conclusion, it is true, however, that the SGP places the economy in an MD regime by explicitly limiting fiscal variability (total deficit variability) rather than focussing on systematic responses to debt accumulation in order to guarantee solvency. This choice may certainly affect fiscal behaviour under EMU. The reason is that pre-EMU fiscal behaviour seems to have been in conflict with the two requirements of the Pact: the evidence cannot be characterised as representing a medium-term close-to-balance behaviour, and total deficits above 3 per cent were not unusual.

The question, then, is how EMU may specifically affect the fiscal rules. A proper answer to this question is not available because the two requirements of the SGP are compatible with a wide range of 'passive' fiscal rules and EMU has not generated enough sample variability to allow US to identify a specific one. However, we can take our pre-EMU fiscal specification as the benchmark for comparison and speculate on what type of modifications could eventually be required by the Pact. A first observation in this sense is that the flexibility to change the fiscal response (primary surplus adjustments) to the output gap will be low to the extent that it essentially represents the response associated with automatic stabilisation,[19] which the SGP favours. Thus, we can fairly safely take as given the output gap component of systematic fiscal policy.

This leaves us with potential for modification in two elements of fiscal behaviour: the response to the stock of debt and the variability of fiscal policy shocks. A likely scenario is that the SGP will force a modification of both elements. A stronger response to debt will accelerate the consolidation efforts needed during the transition to a close-to-balance position. At the same time, a reduction in the variability of the most volatile non-systematic policy tool, according to the pre-EMU evidence presented in subsection 8.4.3, may be needed in order to respect the 3 per cent constraint during the transition to a close-to-balance position. Once this position is reached, the variability of the fiscal shock could remain lower than in the pre-EMU period if a strict interpretation of the Pact, calling for just automatic stabilisation and no discretionary actions, prevails.

Would this scenario imply a shift in policy? A larger response to the stock of debt would certainly shift the historical rule, but still leave the economy in an MD regime. With regard to fiscal shocks, a reduction of their volatility implies a change in the variance of the non-systematic component of fiscal policy. However, as Leeper and Zha (2002) point out, the relevance for policy analysis of a change in the variance of the random component of policy depends on the extent to which anticipated or unanticipated changes are important for macroeconomic variability. If, as New Keynesian macroeconomics suggests, anticipated policy changes are a main source of macroeconomic variability, a change in the properties of the unanticipated component of policy may be largely irrelevant. Thus, even if it were permanent, a reduction in the variance of the non-systematic component of fiscal policy arising from EMU may turn out to be a policy shift of minor importance for macroeconomic analysis.[20]

Appendix 1: Statistical framework

Countries

Our panel of countries comprises thirteen EU member states (Belgium, Denmark, Germany, Spain, France, Ireland, Italy, the Netherlands, Austria, Portugal, Finland, Sweden and the UK). Greece and Luxembourg have been excluded because of the lack of data.

Variables

Quarterly three-month money market rate. IMF (IFS).
Quarterly industrial production index. IMF (IFS).
Quarterly consumer price index. OECD (MEI)
Quarterly real exchange rate index. European Commission (DG ECFIN)
Quarterly international commodity price index. Commodity Research Bureau (CRB).
Quarterly M3 index. OECD (MEI) for Denmark and Sweden; EUROSTAT for the other countries.
Annual government primary surplus. AMECO (DG ECFIN)
Annual government stock of debt. AMECO (DG ECFIN)

Sample period and dummy variables

1979–98 for the fiscal rule and 1979Q1–1998Q4 for the monetary rule. The exceptions to these sample sizes are, for the fiscal rule, Portugal (1981–98), and, for the monetary rule, Belgium (1981Q1–1998Q4), Ireland (1980Q1–1998Q4) and Portugal (1981Q1–1998Q4). Dummy variables in the fiscal rule: Germany, 1990–4; France, 1992–5; Portugal, 1983–7. Dummy variables in the monetary rule: Ireland, 1992Q4–1993Q1; Portugal 1983Q1–1987Q4; Sweden 1992Q3.

Notes

1. Belgium, Germany, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal and Finland. Greece adopted the euro in January 2002.
2. For an earlier and less focussed version of the work presented in this chapter, see Ballabriga and Martinez-Mongay (2002).
3. CGG in subsequent citations.
4. Section 8.5 will elaborate on this issue.
5. Explanations for this observed tendency include fears of financial disruption (Goodfriend, 1991) and uncertainty about policy effects due to model uncertainty (CGG, 1999).
6. See Appendix 1 to this chapter for details concerning sample period exceptions.
7. The so-called Maastricht effect has been extensively documented in the literature. See, for instance, von Hagen, Hughes Hallet and Strauch (2002).
8. In broad terms, their estimates are for the 1980s in the case of France, the UK, and Italy, and extend up to 1993 for Germany.
9. CGG (1998) find a positive significant response to the output gap only for Germany and the UK, with a coefficient value around 0.25 and standard error around 0.03.
10. The classical reference is Sargent and Wallace (1981)
11. Woodford (2001a) provides a recent survey of this literature.
12. See, for example, Cochrane (1998).
13. See, for example, Leeper (1991, 1993) and Andrés, Ballabriga and Vallés (2000, 2002); also Leith and Wren-Lewis (2000).
14. The wide consensus about the key role for stability of these two parameters has recently received some criticism. Benhabib, Schmitt-Grohe and Uribe (2001) point out that considering potential effects of monetary policy on the supply side may affect the stability regions. From a different perspective, Leeper and Zha (2001) argue that stability may depend on a broader set of parameters when the highly stylised macroeconomic framework that typically underlies the stability analysis is replaced by a less restricted one.
15. For simplicity, all these parameter ranges assume a time-preference factor equal to 1.
16. Yearly monetary policy residuals have been obtained as averages of quarterly residuals. The correlation values are not reported.
17. In particular, convergence of interest rates.
18. We are aware that the substitution of national monetary policies by a single euro-area monetary policy introduces one-size-fits-all issues, from which we abstract in this chapter. Our focus is on the prevalent policy regime for the EMU economy.

19. That this is approximately true is suggested by the fact that when the model in table 8.1 is estimated with the cyclically adjusted primary surplus as the dependent variable, the response to the output gap is generally non-significant.
20. We should stress that our focus here is on the relevance of the shift for macroeconomic analysis. A different matter is the political feasibility of the reduction in variance and so, of the fiscal architecture of EMU.

Comments on chapters 7 and 8

Werner Roeger

Both chapters 7 and 8 try to identify and estimate fiscal and monetary policy behaviour since the 1970s in EU countries. There are slight differences in country coverage, estimation period and periodicity. Favero covers France, Germany, Italy and Spain and estimates from the early seventies to the end of the nineties using semi-annual data. Ballabriga and Martinez-Mongay estimate fiscal and monetary rules for EU countries over the period 1979 to 1998, using annual data. The methodology also differs. Favero uses a VAR approach while Ballabriga and Martinez-Mongay estimate fiscal and monetary rules directly. Both chapters arrive at a number of similar conclusions, especially concerning the role of the Bundesbank, the interaction of monetary and fiscal behaviour and the relative importance of exogenous shocks. Favero provides an in-depth analysis of fiscal and monetary rules over the last thirty years embedded in a more structural economic framework, while the second chapter is more forward-looking in trying to assess to what extent EMU may constitute a break in monetary and fiscal behaviour. I will also structure my comments along these lines, starting with a discussion of Favero's chapter and then moving on to Ballabriga and Martinez-Mongay's study.

Comment on Favero

Favero tries to distinguish between systematic and random elements in policy and derives some interesting conclusions on the conduct and interaction of fiscal and monetary policy in recent history. His main conclusions are:

- monetary policy rules outside Germany were not capable of controlling inflation in the seventies;
- policies in the eighties and nineties were anchored more tightly to the Bundesbank;
- monetary policy shocks were small;
- episodes of expansionary fiscal policies cannot be explained by fiscal rules, but were driven by changes in policy (e.g. with a new government) or exogenous shocks (e.g. German reunification);
- the deviation of fiscal authorities from their rules did not cause a monetary policy response;

The views expressed are those of the author and should not be attributed to the European Commission.

- interactions between monetary and fiscal authorities were restricted to the response of government expenditures and receipts to interest payments on government debt.

My discussion of his chapter will be organised as follows. First, I will discuss the policy rules. Second, I will give my own interpretation of the high inflation period and its relationship with monetary and fiscal rules. In fact I believe that the relationship is more complex than suggested in the chapter. Finally, I will comment on the policy interactions as interpreted by Favero.

The monetary and fiscal reaction functions have three elements. Monetary policy responds by increasing interest rates whenever the output gap and/or inflation rises. This is the standard Taylor rule which is by and large accepted as a simple way of describing monetary policy behaviour. It suggests an objective function where the central bank cares about cyclical GDP and inflation. The objective of fiscal authorities is different and focusses on output and debt stabilisation, not inflation stabilisation. The estimated rules capture another important stylised fact about policy, namely that there is substantial inertia in both interest rates and fiscal instruments.

The residual of these equations is interpreted as a random or non-systematic element of policy and the decomposition between systematic and random elements plays a crucial role in the discussion later on in the chapter. Given the specification of the rules the random components seem to be interpretable as separate fiscal and monetary policy shocks. However, one should keep in mind that this interpretation rests on the assumption that fiscal and monetary policy do not interact with each other within a period of six months, which is the periodicity chosen in the model. Also, the interpretation of the random component as non-systematic policy can be questionable. I would prefer a stricter criterion for non-systematic policy, namely uncorrelatedness with any demand and supply shock as well as with fiscal shocks (in the case of monetary policy) and monetary shocks (in the case of fiscal policy), since optimal monetary and fiscal policy would suggest a rapid response of policy to random shocks. As can be seen from table 8.2, the cross-correlations with the 'policy shocks' can be quite sizeable, and there may therefore be a stabilising element in the random component of the policy rules that is overlooked in the analysis in the chapter. In general I suspect that Favero overestimates the non-systematic component of policy and underestimates the policy interactions.

However, there is at least one dimension in which Favero most likely underestimates policy errors, namely when it comes to an interpretation of the high inflation episode in European countries (but also in the United States and Japan) in the seventies. Already the wide international spread

Table 8.4. *Trend productivity growth*

	Before 73 (1960–73) (%)	After 73 (1974–1990) (%)
France	4.6	2.2
Germany	4.1	1.9
Italy	5.4	2.0
Spain	6.1	2.6

of accelerating inflation suggests that a more systematic error (than what could be reflected in an error term of a residual) was made by various central banks at the same time and in the same direction. This can hardly have been a random mistake; it was most likely a general misperception about trend GDP growth that triggered inflation in Western industrialised countries. Obviously, Favero cannot capture this misperception in his regressions, which are based on an output gap which is calculated *ex post*. By now it is well known that trend growth in productivity changed at the beginning of the seventies (see table 8.4). At the time it was nearly impossible to separate the trend decline in productivity from the temporary negative supply shock caused by substantial OPEC price increases. Indeed, as Nelson (2002) shows, even professional economists such as Samuelson, for example, assumed potential growth rates of 4 per cent in the second half of the seventies and correspondingly estimated output gaps in the range between 6 and 8 per cent. Estimates of output gaps in real time even had the series at around −12 per cent at the end of 1975 (see Orphanides, 2000).

It seems to me that it is insufficient to blame a policy rule for what has happened in the seventies. Accelerating inflation can only be understood in the context of specific shocks hitting the economy and a characterisation of the information set available to policy-makers. A permanent decline in productivity growth which was misperceived by monetary policy could be the essential ingredient for rising inflation. In order to shed some light on the high inflation episode and the role played by the monetary policy rule I have conducted the following experiment with the European Commission's QUEST model. A permanent reduction in the growth rate of total factor productivity of 1.5 per cent under both an accommodating policy and an inflation targeting rule is simulated. The precise specification of the Taylor rule under the two alternatives is as follows:

$$i = i^* + a(\pi - \pi^*) + b(y - ypot)$$

accommodating policy: $a = 0.75; b = 1.25$

inflation targeting: $a = 2.0; b = 0.25$

Table 8.5. *Effects of a Permanent Negative Supply Shock QUEST Simulation Results*

	(1A) Inflation targeting; no misperception			(1B) Accommodating policy; no misperception		
	Year			Year		
	1	2	3	1	2	3
GDP	−1.01	−2.19	−2.57	−1.06	−2.20	−2.57
INF	0.31	0.22	0.25	0.37	0.25	0.31
	(2A) Inflation targeting; with misperception			(2B) Accommodating policy; with misperception		
	Year			Year		
	1	2	3	1	2	3
GDP	−0.44	−2.15	−3.28	0.55	−0.96	−1.72
INF	0.80	1.43	1.83	1.74	3.94	5.87

Note: GDP, INF: Deviation from baseline levels.

In order to demonstrate the importance of misperception, four sets of simulations are run. In a first set it is assumed that the central bank correctly adjusts the output target (*ypot*) in the interest rate rule, while in the second set the output target remains unaltered, i.e. the central bank misperceives the permanent shock as only a temporary deviation from trend.

The results in Table 8.5 clearly show the importance of misperceptions when judging the relative merit of the two rules. Only under misperception is there a clear difference in the inflation outcome between the two rules. Why is the difference when full information is available to the central bank so small? According to the logic of the monetary policy rule a permanent (negative) total factor productivity shock translates directly into a reduction of potential output and not a negative output gap. This means that no matter which policy rule is followed there is not much of an incentive for changing the nominal interest rate. Also notice that there is not much inflation generated under either rule if the shock is correctly perceived and therefore differences in inflation coefficients do not matter very much for adjusting interest rates.

Matters are very different, however, if the shock is misperceived. As can be seen from the table, the choice of policy rule matters a lot for inflation. This shows that, at least in the case of a (permanent) supply shock, the rule is not so important as long as the central bank knows exactly what is going on. The choice of rule becomes important in a world

of uncertainty and limited information about the nature of the shock hitting the economy. If the central bank misperceives the permanent shock as temporary it will respond by reducing interest rates and a low inflation coefficient in its rule will not correct the initial mistake of the central bank and guide the central bank to an adequate response. If in contrast the coefficient of inflation in the monetary rule is high then the mistake will be corrected more easily and inflation persistence will be much lower.

Though I would agree with Favero that inflation targeting is a more successful policy rule in terms of inflation, this difference only manifests itself clearly if one takes the complex informational environment faced by central banks into account when simulating the effects of policy. I would even go so far as to conclude that sticking to the traditional rule would have been sufficient for EU central banks to fight inflation if they had been operating in a full information environment. From this discussion I would also conclude that a better distinction between systematic and random policy should be based on real-time estimates.

How conclusive is the evidence provided on the responsiveness of central banks to fiscal shocks? Favero seems to base this conclusion primarily on the absence of a systematic response of monetary policy to fiscal shocks in his regressions (though it is unclear whether this was actually tested). However, one can object to this view on various levels. First, on a purely technical level, one could argue that the stochastic shocks to monetary and fiscal policy are identified only under the assumption that there is no contemporaneous (within six months) response of monetary policy to fiscal policy and vice versa. But even if the identification scheme suggested in the chapter is the correct one, for monetary policy to respond to fiscal shocks it is not necessary for monetary authorities to be able to identify these shocks and respond specifically to fiscal shocks. As long as they apply a stringent inflation targeting rule they will respond to all demand shocks, including of course fiscal shocks. There is indeed evidence provided by the empirical literature on fiscal multipliers (see, for example, Perotti, 2002) which suggests that the size of fiscal multipliers declined in EU countries in the eighties. This evidence would be consistent with the change of the monetary rule towards more inflation targeting that is shown by Favero in previous sections of the chapter and which seems to be more or less uncontroversial. This suggests that Favero's conclusions on policy interactions could be too strong.

8.6 Comment on Ballabriga and Martinez-Mongay

The chapter by Ballabriga and Martinez Mongay is interesting since it links its empirical analysis to recent macroeconomic discussions about

the respective roles of monetary and fiscal policy for price level stabilisation. Guided by these discussions, the authors specify monetary and fiscal rules and empirically estimate the coefficients. On the basis of these estimates they discuss the extent to which a change in behaviour should be expected with EMU. Their analysis reaches a number of interesting conclusions. They interpret EMU, which broadly consists of a mandate for the ECB to keep tight control on inflation and the Stability and Growth Pact, which demands fiscal discipline, as a 'monetary dominance' policy regime. Since their empirical analysis identifies the pre-EMU period as a monetary dominance regime as well, they therefore do not expect a fundamental regime shift, although they concede that specific provisions in the Pact such as the 3 per cent of GDP deficit limit and the emphasis on automatic stabilisers may require some changes in fiscal behaviour. In particular, they foresee a stronger debt response, at least for a while until a close-to-balance position is reached, and they anticipate a reduction in fiscal shocks since policy will rely more strongly on automatic stabilisers. Nevertheless, they argue that 'EMU may turn out to be a policy shift of minor importance for macroeconomic analysis'.

I will concentrate my discussion on the fiscal rule and only briefly comment on the monetary rule. As far as I can see, the results obtained on the monetary rule are less controversial and in line with other recent empirical results. Unlike the case of monetary policy, where the Taylor rule has gained some prominence in recent years, simple fiscal policy rules are far less well established empirically. The authors follow previous attempts and specify a fiscal rule which takes the government primary surplus as the policy instrument and they postulate two objectives, namely, debt stabilisation around a certain target and output stabilisation. In addition, they also allow for some policy inertia plus random shocks. The results obtained look reasonable and correspond with prior expectations. In particular, the estimates indicate a counter-cyclical movement of the primary balance but they also show that debt stabilisation played a role in the pre-EMU phase.

Nevertheless, I have some problems with the fiscal policy rule. Unlike monetary policy, which has a relatively precisely defined policy objective and a clearly identified instrument, fiscal policy seems to be more complicated. I think one can argue that the primary deficit is far less directly controllable by fiscal authorities than interest rates by the central bank. With different layers of decision-making, lags in fiscal policy implementation and the reliance of both expenditure and revenues on macroeconomic conditions, it is difficult to regard the primary surplus as an instrument of fiscal policy in the same sense in which interest rates are an instrument of monetary policy. Of course, the specification, to some

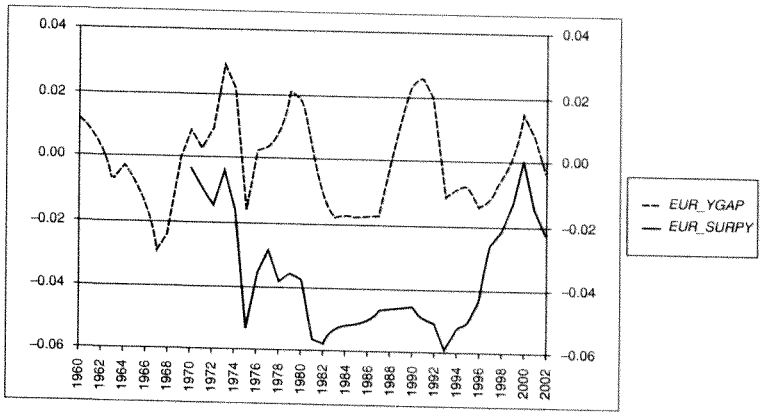

Figure 8.4. Budget surplus and output gap (EU-12).

extent, takes care of this by allowing for policy shocks and inertia. However, I have some problems in interpreting the estimated coefficients as reflecting the intentional behaviour of governments. Take, for example, the Italian debt target, which is estimated at around 90 per cent. Was this the debt target decided by the Italian government in the seventies and finally reached in the nineties or is this simply the result of a sequence of unsuccessful attempts to stimulate the economy? The same observation would, of course, hold for many other EU countries. The general point which I want to make is the following: I find it very difficult to identify a debt target empirically over a relatively short estimation period. It is even more complicated when debt shows a rising trend over that period. To put it differently, it seems plausible to identify a debt target if the debt-to-GDP ratio fluctuates around a mean value but it seems hard to pin down such a target over periods of rising debt-to-GDP ratios.

This brings me to my next point. Not only must the authors assume that the estimated rules in some sense reflect the intentions of governments but they also must assume that these estimates are time-invariant. Not only have some countries seen a change in government but it is also plausible that governments may have changed the rules in light of frustrating experiences with past policies. A visual inspection of the data shown in figure 8.4 suggests such an interpretation. The evolution of the net-lending-to-GDP ratio (EUR_SURPY) shows three largely distinct periods. In the early seventies, government deficits where fluctuating around a value of 1 per cent of GDP. Then, starting at around 1974 and lasting until the mid-nineties, the average deficit-to-GDP ratio fell to 4.6 per

cent, while over the period 1997 to 2004 the average deficit is expected to reach a level of 1.7 per cent. Of course, these numbers only refer to the EU average. There were more extreme values for individual countries; Italy, for example, reached an average deficit-to-GDP ratio of 9.5 per cent over the same period. I would regard this episode as clearly indicating an unsustainable fiscal regime. If this interpretation of regime change is correct then it would offer another perspective on fiscal policy. In contrast to what is claimed in the chapter, one might argue that fiscal policy was on a clearly unsustainable path over the period 1974 to 1994. A policy change occurred in the early nineties when EMU became a realistic possibility. In the approach to EMU the deficits were brought back to levels prevailing in the seventies. This view would also be supported when one compares the evolution of deficits with that of the output gap (EUR_YGAP), which shows a clear decoupling of deficit fluctuations from the business cycle. Only in recent years have we returned to historic ratios between deficits and output gaps.

Of course there are various remaining puzzles to be addressed. Why did the acceleration of inflation stop in the early eighties despite persistent deficits? How should we interpret the counter-cyclical response of deficits? On the first question both this chapter and the one by Favero give at least a partial answer. At the beginning of the eighties, EU countries seemed to have accepted the leadership role of the Bundesbank. This also coincided with the establishment of the EMS which might have served as a further signal that government budgets would be brought back into equilibrium eventually. Concerning the second question, I would remark that a positive coefficient on the output gap may not necessarily imply a clearly stabilising role for fiscal policy. A positive coefficient is not a sufficient proof that fiscal policy is counter-cyclical; it can simply emerge because fiscal policy is expansionary in recessions, without being contractionary in booms. Such an interpretation seems plausible when looking at figure 8.4. In the two boom years, 1978 and 1990, the deficit was above 3 per cent which can hardly be interpreted as counter-cyclical.