Session 2

EUROPEAN FISCAL RULES

MONETARY AND FISCAL POLICY INTERACTIONS UNDER A STABILITY PACT

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1. Introduction

The completion of Economic and Monetary Union (EMU) - based on the precise mission to the European Central Bank (ECB) to maintain price stability and guidelines for the conduct of national fiscal policies - has prompted a renewed interest on the interplay between monetary and fiscal policies.

The traditional Optimal Currency Areas literature pointed out long ago that, in a monetary union, fiscal policy has to play a more important role in cyclical stabilisation given the loss of national monetary independence. This is particularly the case if shocks are not perfectly correlated across frontiers. Fiscal flexibility, together with budgetary discipline and coordination, has come to be seen as a central pillar fiscal policy in a currency area (European Commission, 1990). The Stability and Growth Pact (SGP) has been the operational response of EU countries to the quest for budgetary discipline in EMU.

Recent theoretical and empirical developments have shed new light on the "old" issue of the interactions between monetary and fiscal authorities. At the theoretical level, much work has been devoted to the rationale for fiscal constraints in a monetary union.

A formal model of the SGP is provided by Beetsma and Uhlig (1999) (see also Beetsma, 2000). In a two-period model of a monetary union, myopic governments who know that they may be replaced at the beginning of the second period issue more debt than a social planner would do. This would constrain monetary policy in the second period. This effect is magnified in a monetary union because the adverse impact on the common monetary policy is diluted. As a result, the incentive to restrain

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public debt accumulation is reduced and we end up with an overburdened monetary policy. Hence, a pact limiting public debt accumulation increases welfare in a monetary union.

However, Chari and Kehoe (1998) argue that the desirability of imposing fiscal constraints crucially depends of the ability of the single monetary authority to commit to its future policies. Only to the extent that monetary policy cannot commit, there are gains from imposing budgetary constraints. This conclusion is "consistent with the view that the framers of the treaty thought that it is extremely difficult to commit monetary policy and therefore wisely included debt constraints as an integral part of the treaty" (Chari and Kehoe, 1998: 2).

The degree of commitment by the central bank affects the design of stabilisation policies in a monetary union. If the central bank is "strong", fiscal constraints are damaging because they limit the room for manoeuvre by fiscal authorities in responding to shocks. This result is emphasised by Cooper and Kempf (2000). These authors conclude that only if shocks are highly correlated across countries and the central bank is strongly committed to price stability, then a fiscally constrained monetary union dominates the outcome with multiple currencies. Instead, under idiosyncratic shocks, moving to a fiscally-constrained monetary union would be welfare-reducing: "if the set of policy instruments open to fiscal authorities is sufficiently restricted, then monetary union may not increase welfare. Despite having commitment power, the central bank lacks the tools to stabilize in the presence of country specific shocks that are not perfectly correlated." (Cooper and Kempf, 2000: 27).

The conclusion that a monetary union with a strong central bank and no limits on fiscal policies is optimal has been questioned. Recent contributions have pointed out that "strength" or "weakness" of the central bank is not exogenous to the behaviour of fiscal authorites.

The so-called Fiscal Theory of the Price Level (FTPL) has highlighted that, if government solvency is not guaranteed, monetary policy will not be able to control the price level. In order to ensure stability, fiscal policy has to react sufficiently strongly to a rise in the interest rate in the event of inflationary pressures by increasing the primary surplus. In other words, an "active" monetary policy aiming at keeping inflation in check - as the ECB is mandated to behave - has to go hand in hand with an

"active" fiscal policy[1]. Once the FTPL is applied to the EMU institutional set up, however, seemingly different conclusions are drawn. While Sims (1999) considers the Maastricht *cum* SGP rules insufficient to rule out FTPL's doom scenario, Canzoneri and Diba (2001) conclude that the SGP appears far too strict from the point of view of guaranteeing fiscal solvency. The latter authors, in particular, call for shifting the attention from nominal to cyclically-adjusted budget balances in assessing compliance of EMU members with budgetary prudence so as not to hamper fiscal stabilisation.

The ability of budgetary authorities to affect monetary commitment is also explored in a number of recent papers by Dixit and Lambertini (see, Dixit and Lambertini, 2000a, b, c; and Dixit, 2000). In a game theoretic framework, monetary and fiscal authorities minimise a quadratic loss function in inflation and output, but final targets and the weight attributed to them vary (typically the central bank is assumed to be more inflation-conservative). These authors conclude that fiscal discretion "destroys monetary commitment" and, as such, may justify rules imposed on budgetary behaviour. But imposing rules is not sufficient per se: another important conclusion by Dixit and Lambertini is that if final targets differ (e.g. the central bank is an inflation hawk and the fiscal authority aims at pushing output beyond its natural level), a race between monetary and fiscal policy would lead the equilibrium levels of output and inflation far away form the preferred choices. Hence, agreement on the final targets between monetary and fiscal authorities is paramount to lead to a Nash equilibrium which is close to the authorities preferred choices.

The importance of the difference in objectives of monetary and fiscal authorities is also stressed by Demertzis et al. (1999) and Hughes Hallett and Viegi (2000) who find that, if the two authorities pursue their separate goals independently, a conflict arises. From a political economy viewpoint, the authors point out that the establishment of a conservative central bank - strongly biased in favour of price stability - may increase the chances of left-of-centre governments - mainly output-concerned - being elected. This divergence of preferences would heighten the monetary and fiscal conflicts and, by the same token, increase the gains from coordination.

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[1] Some terminological confusion exists in the literature. Such fiscal behaviour is dubbed "active" by Sims (1999), following the original contribution by Leeper (1991), or "Ricardian" according to Woodford (1995). On the contrary, Leith and Wren-Lewis (2000) call such reaction function "passive".

Quite unrelated to this theoretical developments, an empirical literature has addressed in recent years the issue of how monetary and fiscal authorities "actually" behave.

In a seminal paper, Jacques Mélitz uses pooled data for 19 OECD countries, including 14 EU members (except Luxembourg) over the period 1960 until 1995 (Mélitz, 1997). He finds that monetary and fiscal policy tend to move in opposite directions. In his definition, the two policies are "strategic substitutes": looser fiscal policy promotes tighter monetary policy while tighter monetary policy triggers an expansionary fiscal policy. In other words, the "Sargent and Wallace" scenario of a sustained fiscal boost eventually triggering a monetary relaxation does not find confirmation in the data. As the author points out in a more recent paper, "(t)his negative interaction should be interpreted as saying that tightening (easing) of one instrument means less tightening (easing) of the other. Both instruments may still concurrently be tight (or easy, as the case may be)". (Mélitz, 2000:16).

Evidence of strategic substitutability is also found in Wyplosz (1999): the central bank raises the interest rate when the deficit increases. In other words, "(b)oth (authorities) attempt to keep inflation in check and to conduct counter-cyclical policies, but each does less when the other moves in the same direction" (Wyplosz, 1999:43). The result that fiscal policy tends to relax when monetary conditions become tighter is confirmed by von Hagen et al. (2000) for a panel of 20 OECD countries from 1973 to 1989. These authors, however, find that monetary conditions react positively to a tighter fiscal policy, that implies that the reaction of monetary policy to fiscal policy has the opposite sign from the reaction of fiscal policy to monetary policy.

To what extent, the EMU project has influenced the reaction function of monetary and fiscal authorities? Von Hagen et al. (2000), find evidence of a "Maastricht effect" in the 1990s in the EU: "on average in the EMU member states, fiscal policy in the 1990s was less reactive to cyclical fluctuations of output and changes in monetary policy than it was in earlier times" (von Hagen et al., 2000: 58). A recent report by the European Commission (2000), argues that monetary policy has, on average, loosened since the beginning of the 1990s (albeit starting from a very tight position), thereby supporting the budgetary retrenchment by EU countries to meet the

Maastricht criteria for joining EMU[2]. Hence, in Mélitz' definition, monetary and fiscal policies have been strategic substitutes in the last decade in most EU countries[3].

The theoretical literature reviewed above looks at the rationale for budgetary constraints but rarely embodies explicitly EMU and SGP-relevant rules in budgetary behaviour. While a number of studies[4] encompass a cost of "fiscal policy activism", to our knowledge, no paper encompasses the 3% *cum* "close-to-balance" rule of the SGP which would ensure budgetary prudence while leaving room for manoeuvre for fiscal stabilisation. The empirical literature, while providing interesting insights, lacks theoretical foundations and, as such, is of limited usefulness in understanding the reaction function of monetary and fiscal authorities and, especially, in anticipating the type of interactions which will prevail in EMU. As we argue below, strategic substitutability and complementarity between the two policies - and its interpretation in terms of "conflict" or "cooperation" - depend crucially on the typology of shocks hitting the economy and on the objective functions of monetary and fiscal authorities.

Our paper provides a simple analytical setting for assessing the interactions of monetary and fiscal authorities when the latter are subject to upper limits on the budget deficit. A particular emphasis is put on the design of stabilisation policies.

The structure of the paper is as follows. In section 2 we outline a simple model of monetary and fiscal behaviour capturing some of the main features of the Maastricht institutional framework. The solution of the game between monetary and fiscal authorities under non-cooperation and cooperation is provided in sections 3 and 4, respectively. Section 5 presents some numerical simulations with the Commission Services' QUEST model on the quantitative relevance of the theoretical findings. Section 6 provides a summing up of the main results and discusses some policy implications.

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2 One should, however, make a distinction between "level" and "direction" of the monetary stance. While monetary policy loosened over the retrenchment period, it remained basically cautious as confirmed by looking at the difference between actual and "Taylor" interest rates. See OECD (1999).

3 However, this is not true for all countries. As shown in European Commission (1999), tighter monetary policy has gone hand in hand with tight fiscal policy in Italy. This complementarity between the two policies is probably explained by the "double convergence" - on budget deficit and inflation - that Italy had to accomplish to meet the Maastricht requirements.

4 See, e.g. Aarle et al. (2000), Bennett and Loayza (2000) and Leitmo (2000).

2. A simple model of monetary and fiscal policy interactions

The Maastricht Treaty and secondary legislation provide a clear assignment of objectives to monetary and fiscal authorities in EMU.

The primary task of the ECB is to maintain price stability. In order to achieve price stability, the single monetary authority is entrusted with both "goal" and "instrument" independence. To the extent that price stability is not jeopardised, the ECB is called upon to support the general economic policies in the Community.

The SGP is the backbone of fiscal policy in EMU. The Pact can be seen as strengthening the procedures introduced by the Maastricht Treaty, at least in relation to the deficit criterion. Its objective is to ensure that fiscal prudence - as embodied in the Treaty fiscal criteria - applies not only in the run up to the single currency, but becomes a permanent feature of the EMU. It demands that the countries of the European Union (EU) aim for "medium-term objectives of budgetary positions close to balance or in surplus". This objective is believed to ensure budgetary discipline whilst preserving a sufficient room for manoeuvre for fiscal stabilisation without infringing the 3% of GDP deficit ceiling.

The model outlined below aims at capturing in simplified fashion some the main features of the Maastricht monetary and fiscal architecture, namely the objectives of price stability and fiscal prudence.

The model encompasses a demand-(IS) equation and a supply-(Phillips curve) equation of standard type determining the value of the output gap, *G,* and inflation, π :

$$G^D = \phi_1 d - \phi_2 \left(i - \pi^e\right) + \varepsilon_1 \tag{1}$$

$$G^S = \omega\left(\pi - \pi^e\right) + \varepsilon_2 \tag{2}$$

where *d* is the budget deficit, i is the nominal interest rate, ε_1 is a demand shock and ε_2 is a supply shock. The superscript '^{e}' indicates expected variables. The rest of the world is omitted. The coefficient ω in (2) can be interpreted as the degree of labour market flexibility: a high ω implies that an inflation surprise, by lowering real wages, entails a strong rise in supply; on the contrary, a low ω implies that real wages are rigid and supply responds little to unexpected inflation.

The budget deficit is defined as follows:

$$d = d_s - \alpha G \tag{3}$$

where d_s is the cyclically-adjusted balance and α is the cyclical sensitivity of the budget[5]. The nominal deficit *d* should not exceed a deficit ceiling: $d \leq \bar{d}$.

By replacing (3) in (1) and solving for *G* and π , we obtain:

$$G = \frac{1}{1+\phi_1\alpha}\left[\phi_1 d_s - \phi_2(i - \pi^e) + \varepsilon_1\right] \tag{4}$$

$$\pi = \frac{1}{\omega(1+\phi_1\alpha)}(\phi_1 d_s - \phi_2 i + \varepsilon_1) - \frac{\varepsilon_2}{\omega} + \left[1 + \frac{\phi_2}{\omega(1+\phi_1\alpha)}\right]\pi^e \tag{5}$$

The policy rules specify the setting of d_s by fiscal authorities and *i* by the central bank.

The instrument of fiscal authorities is the cyclically-adjusted budget balance. This formulation implies that, when interest rates move, there occurs an internal compensation between the interest burden and the primary balance. This specification of the fiscal policy rule simplifies considerably the algebra, but misses a potentially important channel of interaction between monetary and fiscal policy via the effect of monetary decisions on interest payments. This effect is quantitatively limited if the stock of public debt is low and/or its maturity is relatively long. It also implies that, in the jargon of the FTPL, that fiscal policy is "active", that is it reacts to a change in monetary policy.

Fiscal policy can be in an unconstrained or a constrained regime. In the first case, the fiscal authority chooses d_s to minimise the following loss function:

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[5] Mainstream estimates indicate that the value of α is around 0.5 for the EU and EMU as a whole. However, if varies between 0.3-0.4 for the Mediterranean countries to 0.8-0.9 for the Nordic countries; see, European Commission (2000) and van den Noord (2000). Other studies, however, find considerably lower values of the automatic stabilisers (between 0.1 and 0.2); see, Mélitz (2000).

$$\text{L(FP)} = (d_s - d'_s)^2 + \theta(G - G')^2 \tag{6}$$

Equation (6) indicates that the government cares about output and would like to deviate as little as possible from the medium term target d'_s which is consistent with the "close to balance" rule of the SGP. In other words, fiscal authorities have a preferred output target, but policy activism to achieve it is costly.

A crucial choice concerns the preferred output gap: if the fiscal authority simply aims at stabilising the business cycle, G' will be equal to zero. A strict interpretation of the SGP provisions (see, e.g. Buti et al., 1998) would imply setting a sufficiently ambitious budgetary target and just let automatic stabilisers work. This implies θ and G'=0. Instead, if the government aims a level of output higher than the natural level (i.e. an unemployment below the natural rate), G' is positive. This formulation seems to us more consistent with actual preferences and institutional arrangements than models in the Barro-Gordon tradition which attribute to the central bank the willingness to reduce unemployment rate below its natural level via surprise inflation[6].

If, in the case of particularly severe shocks or too high medium term target, fiscal policy is constrained, d_s will change so as to satisfy $d = \bar{d}$ for any value of G.

The basic assumption underlying this behaviour is that member countries treat the prospect of infringing the deficit ceiling as one to be strictly avoided. That is, we assume that the cost of risking the triggering of the sanctions procedure of the SGP is regarded by all countries as large. Those costs include not only the formal financial penalties envisaged in the sanctions procedure but also the costs that the market might inflict and the loss of reputation that could be involved. In Eichengreen and Wyplosz (1998)'s words, this implies that the 3% limit is going to be viewed as a "hard" ceiling. The experiences with the implementation of the Pact confirm such indication (see European Commission, 2000, and Buti and Martinot, 2000). As we do not consider situations where political horse trading may imply delaying or not implementing the sanctions, our analysis can be treated as a "full credibility" benchmark.

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[6] A positive output gap target in L(FP) may also reflect the shorter time horizon of the governments relative to that of the central bank.

The monetary authority aims at maintaining price stability. It is also assumed that the central bank faces a cost in changing the interest rate. This is consistent with the assumption that, as supported by recent evidence, the central bank smoothes out the interest rate[7]. As a consequence, it minimises the following loss function:

$$L(CB) = \pi^2 + \beta(i - i_o)^2 \tag{7}$$

where i_o is the historical interest rate. In equation (7), without loss of generality, the inflation target has been set to zero.

The lack of an output stabilisation term in *L(CB)* simplifies the algebra but does not change qualitatively the results if we maintain that inflation stabilisation has a substantially higher weight than output stabilisation in the central bank preferences.

A justification for interest rate smoothing is that, in the case of conflict between inflation and output stabilisation, the central bank moves slowly towards the required interest rate level. In this case, the smoothing term in (7) can be seen partly as a way to take care of output stabilisation by the central bank[8]. It will be shown later that interest rate smoothing is crucial to maintain a role for fiscal stabilisation in the case of demand shocks.

Equation (7) attempts to capture an inherently dynamic behaviour such as interest rate smoothing within an a-temporal setting. Our formulation implies that, at each point in time, if the inflation rate is off target, the interest rate is changed to close the gap, but only partly. Hence, following a shock, the interest rate converges gradually towards a value that is consistent with the inflation target. What we are looking at below is a situation in which the adjustment has been completed and the interest rate has reached its equilibrium level. We show that this equilibrium level depends on the preferences of fiscal authorities. What we examine in the next sections is the reaction of monetary and fiscal variables to shocks starting from a position of long run equilibrium.

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7 For a summary of the evidence, see Clarida et al. (1999) and Favero and Rovelli (2000).

8 A number of empirical analyses find that the weight of output stabilisation in the reaction function of central banks in Europe is very low. For recent estimates, see, von Hagen et al. (2000).

Given the demand and supply equations and the behavioural rules of fiscal and monetary authorities, the Nash and the cooperative solution are presented in sections 3 and 4, respectively.

3. Nash equilibrium

Unconstrained fiscal policy

In the unconstrained regime, minimisation of (6) gives the following expression for d_S:

$$(8) \quad d_s = \frac{(1+\phi_1\alpha)\left[(1+\phi_1\alpha)d_s^{'} + \theta\phi_1 G^{'}\right] + \theta\phi_1\left[\phi_2(i-\pi^e) - \varepsilon_1\right]}{(1+\phi_1\alpha)^2 + \theta\phi_1^2}$$

The structural budget balance is raised when monetary policy tightens while it reacts negatively to a rise in expected inflation and to positive demand shocks.

Solving the central bank' minimisation problem gives the following expression of i:

$$(9) \qquad i = \frac{i_o\beta\omega^2(1+\phi_1\alpha)^2 + \phi_2\left[\phi_1 d_s + \phi_2\pi^e + \varepsilon_1 - (1+\phi_1\alpha)\varepsilon_2\right]}{\beta\omega^2(1+\phi_1\alpha)^2 + \phi_2^2}$$

An expansionary fiscal policy leads to monetary tightening. The interest rate is increased in the event of a positive demand shock and is reduced in the event of a positive supply shock.

The interplay between monetary and fiscal behaviour is illustrated in Graph 1 which pictures the reaction functions in the policy instruments space. Both reaction functions are positively sloped. The slope of fiscal authorities' reaction function (FP) is higher than that of monetary authorities (CB)[9].

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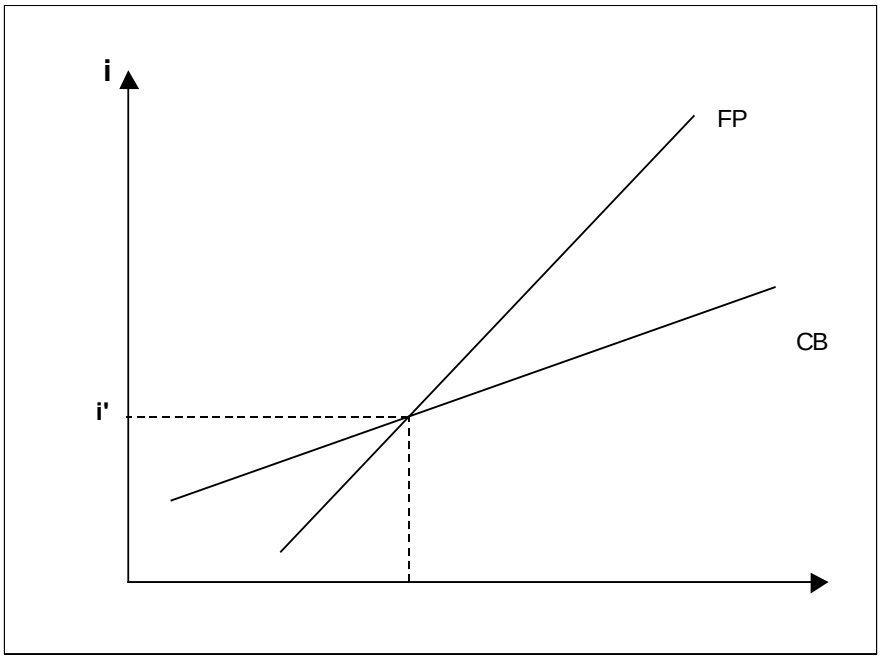
[9] The expressions of the slope of FP and CB are, respectively:

$$\frac{(1+\phi_1\alpha)^2 + \theta\phi_1^2}{\theta\phi_1\phi_2} \quad \text{and} \quad \frac{\phi_1\phi_2}{\beta\omega^2(1+\phi_1\alpha)^2 + \phi_2^2}$$

The difference between the two slopes is always positive. This implies that an expansionary fiscal policy coupled with a restrictive monetary policy results in a higher budget deficit and a higher interest rate (instead of the opposite, as would be the case if CB were steeper than FP).

Graph 1

FP and CB's reaction functions



The Nash equilibrium is determined by the intersection of the two reaction functions.

Since the central bank does not pursue an output objective, it does not face a dilemma between output and inflation. Hence, in equilibrium, it can always meet its inflation target provided that it sets the appropriate interest rate. The equilibrium interest rate, *i',* is obtained from equation (8), under the assumption of no shocks and $\pi^e = \pi$ =0 :

$$i' = \frac{\phi_1}{\phi_2}\left(d_s^{'} + \frac{\theta \phi_1 G^{'}}{1+\phi_1 \alpha} \right) \tag{10}$$

where the term in brackets is the level of the budget balance prevailing in equilibrium. In absence of shocks, the central bank meets the inflation

target while there exists a "deficit bias" if $G'>0$. The intuition for this result is similar to that of the classic Barro-Gordon inflation bias for monetary policy: fiscal authorities keep stimulating demand in the attempt to push output beyond its natural level until the cost of further increasing the deficit brings it too far from target. Clearly, a Maastricht-type ceiling reduces the equilibrium budget deficit via a lower structural target (d'_s). It is easy to show that, if the budget deficit does not enter FP, the system is unstable as the government keeps stimulating the economy (while being always frustrated in equilibrium). From this perspective, the SGP helps anchoring the system and prevent a "passive" fiscal policy from bringing about the FTPL insolvency scenario[10].

The authorities' reaction functions shift in response to shocks. In the case of a negative demand shock (such as a fall in private consumption), FP moves to the right and CB shifts down. The new equilibrium is a lower interest rate while the change in the budget deficit is ambiguous. However, under normal values of the parameters, one may expect a rise in the budget deficit. In the case of a supply shock (such as an oil price rise), monetary and fiscal policies move in the opposite direction: the interest rate goes up to keep inflation under control and, as a response, the budget deficit expands to prop up output. The new equilibrium is characterised by a higher interest rate and a higher budget deficit. Hence, the likelihood of the budget deficit exceeding the target and shifting fiscal policy into the constrained regime is higher under supply shocks.

In order to obtain the expression of the output gap and inflation in the event of demand and supply shocks, we cross substitute from (8) and (9) and, after replacing i' from (10), we plug solution for d_s and i in (4) and (5). Under rational expectations, we obtain:

$$G = \frac{\beta\omega^2(1+\phi_1\alpha)\varepsilon_1 + \phi_2^2\varepsilon_2}{\phi_2^2 + \beta\omega^2\left[(1+\phi_1\alpha)^2 + \theta\phi_1^2\right]} \tag{11}$$

$$\pi = \frac{\beta\omega\left\{(1+\phi_1\alpha)\varepsilon_1 - \left[(1+\phi_1\alpha)^2 + \theta\phi_1^2\right]\varepsilon_2\right\}}{\phi_2^2 + \beta\omega^2\left[(1+\phi_1\alpha)^2 + \theta\phi_1^2\right]} \tag{12}$$

[10] In equilibrium, the model does not feature an inflation bias because the monetary stance, in spite of interest rate smoothing, will be sufficiently tight to prevent the expansionary fiscal policy from endangering the inflation target. However, if e.g., there is a change in government preferences, during the path towards the new equilibrium interest rate, inflation can deviate from target.

Equations (11) and (12) show the fundamental role played by interest rate smoothing. If, contrary to the assumption above, β is set equal to zero, all demand-side parameters disappear from the solution. This implies that the central bank can offset perfectly any demand shock. The intuition is straightforward: as the output gap and inflation move in the same direction, the central bank faces no dilemma and, via a sufficiently strong response of interest rates, is able to close the output gap and preserve at the same time its inflation target. If β is positive, the central bank faces a cost in changing the interest rate. Hence, demand shocks are not fully smoothed and fiscal stabilisation comes back into play. Under β =0, supply shocks feed through unsmoothed while the inflation target is always met[11].

The impact of structural parameters and policy preferences on the output gap and inflation are summarised in table 1.

The sign of the partial derivatives are as expected. In particular, a high degree of interest rate smoothing - implying a low response of monetary policy to shocks - is destabilising in the case of demand shocks while it is output-stabilising and inflation-destabilising in the case of supply shocks. A high preference for output stabilisation by fiscal authorities helps stabilising output and inflation in the event of demand shocks, but is inflation-destabilising in the case of supply shocks.

As shown in the table, high automatic stabilisers (α) and high effectiveness of fiscal policy (ϕ_1) may not lead to overall higher stabilisation in the case of demand shocks. This seemingly counterintuitive result occurs if monetary policy is very effective. In such a case, the combination of a higher response by the budget deficit and a lower reaction by the interest rate (due to interest rate smoothing), may imply a lower overall degree of stabilisation. While theoretically interesting, under normal values of the parameters, higher budgetary stabilisers and a more effective fiscal policy can be expected to lead to higher output stabilisation.

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[11] If *G* appears explicitly in CB's loss function, demand shocks are still fully offset. However, supply shocks will imply a deviation of inflation and output gap from the target values reflecting the conflicting objectives of price and income stabilisation. See, Artis and Buti (2000b).

Table 1

Influence of policy parameters and preferences on G and π

		ϕ_1	ϕ_2	α	θ	β
ε_1	G	+/-	-	+/-	-	+
	π	+/-	-	+/-	-	+
ε_2	G	-	+	-	-	-
	π	+	-	+	+	+

A positive (negative) sign indicates that a rise in the variable leads to an amplification (smoothening) of the shock.

The above results help highlight the preference of each authority for the behaviour of the other authority. This can be obtained by replacing the solution for the G, π , d_s and i in the FP and CB loss functions (equation (6) and (7), respectively) and cross differentiating for the monetary and fiscal parameters. While the algebra is messy, the conclusions are fairly straightforward.

The central bank would like to see higher fiscal stabilisation in the event of demand shocks because that will allow to achieve lower deviations of inflation from target for given changes in the interest rate (or, conversely, attain the same degree of inflation stabilisation with a smaller variation of the interest rate from its equilibrium level). On the contrary, monetary authorities would prefer lower fiscal stabilisation in the event of supply shocks because that will result in lower changes in inflation and interest rates. The preference of fiscal authorities on monetary behaviour depends on the assumptions on the target level of the output gap. If the government pursues "pure" output stabilisation (i.e. G'=0), it would like to see high monetary stabilisation in the case of demand shocks (that is high ϕ_2 and low β) and low monetary stabilisation in the case of supply shocks.

Hence, each authority would like the other to do more in the case of demand shocks and less in the case of supply shocks.

The conclusions are less straightforward if the government aims at a positive output gap ($G'>0$). The above results apply in the case of negative shocks and large positive shocks. However, as highlighted in table 2, in the case of positive but small shocks, the government preference for monetary response is different. Let us consider first a positive demand shock bringing the output gap close to G'. In such a case, the government would benefit from a weak response by the central bank (occurring if the preference for interest rate smoothing, β, is large) because this will allow the output gap to remain in the neighbourhood of G'. In the case of a positive small supply shock shifting the output gap towards but still below G', the fiscal authority would like to see a strong monetary response because higher inflation stabilisation will imply a further increase in the output gap (thereby bringing G closer to G').

These result are relevant for the discussion of the cases of "fiscal dominance" and "monetary dominance" in section 4.

Table 2

Preference of the fiscal authority for monetary reaction

Shock	Negative	Positive small	Positive large
ε_1	small β, large ϕ_2	large β, small ϕ_2	small β, large ϕ_2
ε_2	large β, small ϕ_2	small β, large ϕ_2	large β, small ϕ_2

Constrained fiscal policy

In the above analysis, we have assumed that the budget balance is sufficiently far from the deficit ceiling so as fiscal policy is unconstrained. However, if, following a severe negative shock, the nominal deficit hits the deficit ceiling, we shift to a fiscally-constrained regime[12]. In such a case, the fiscal reaction function simply becomes:

$$d_s = \bar{d} + \alpha G \tag{13}$$

This implies that the discretionary part of the budget moves to compensate for the effect of the automatic stabilisers and thus all fiscal stabilisation is forsaken. The reaction function of the fiscal authority is negatively sloped and, unlike the unconstrained regime, it shifts to the left in the case of a negative demand shock.

Under a constrained fiscal policy, the solution of G and π is the following:

$$G = \frac{\beta\omega^2\varepsilon_1 + \phi_2^2\varepsilon_2}{\phi_2^2 + \beta\omega^2} \tag{14}$$

$$\pi = \frac{\beta\omega(\varepsilon_1 - \varepsilon_2)}{\phi_2^2 + \beta\omega^2} \tag{15}$$

Compared to the unconstrained regime, we have lower output and inflation stabilisation in the event of demand shocks[13] and lower output stabilisation and higher inflation stabilisation in the event of supply shocks.

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[12] Clearly, the likelihood of shifting to a constrained regime depends on the medium term deficit target of the fiscal authorities. If the latter are highly risk averse and want to avoid at all costs an 'excessive deficit', they may set a medium-term target which is able to withstand all shocks - regardless of their severity - without exceeding the deficit ceiling. This approach is behind the calculations of the so-called "minimal benchmarks" which, on the basis of past business cycle experience, allow a sufficient safety margin under the 3% of GDP deficit ceiling. See, European Commission (1999, 2000) and Artis and Buti (2000 a and b).

[13] This holds under normal values of the parameters. See discussion above on the special case of a higher fiscal stabilisation resulting in an overall lower macroeconomic stabilisation.

4. Cooperative equilibrium

In the cooperative solution the two policy instruments, d_s and i, are chosen so as to minimise the joint loss function of fiscal and monetary authorities:

$$L(FPCB) = \eta\left[(d_s - d_s^{'})^2 + \theta(G - G^{'})^2\right] + (1-\eta)\left[\pi^2 + \beta(i - i^{'})^2\right] \tag{16}$$

where $0 \leq \eta \leq 1$ gives the « bargaining power » of the two policy authorities : a large (small) η indicates a strong (weak) fiscal authority.

Given the cumbersome algebra, we illustrate the main results under simplifying assumptions on a number of parameters.

An important result is that, if fiscal policy pursues "pure" output stabilisation (i.e. G' =0), under no shocks the Nash and the cooperative equilibria are the same (namely G= π =0). However, if the government targets a positive output gap (G'>0), the equilibrium solution is characterised by a « deficit bias » and an « inflation bias ». Under the assumption $\phi_1 = \beta = 0$, the expression of the inflation bias is the following :

$$\pi = \frac{G^{'}\omega\eta\theta}{\phi_2(1-\eta)} \tag{17}$$

Clearly, the inflation bias is a positive function of the bargaining power of the fiscal authority and the output gap target. The reason is that, via the combined loss function, the central bank encompasses the fiscal policy target of a positive output gap. Therefore, as in the classic Barro-Gordon result, the central bank stimulates the economy until the (temporary) output gains would be compensated by the additional costs of a further rise in inflation (and, in the general case, by the cost of shifting the interest rate away from its equilibrium value).

In order to examine some of the mechanisms at work, it is useful to consider two extreme cases of cooperation: « fiscal dominance » (η =1) and « monetary dominance » (η =0).

Under fiscal dominance, the government uses both policy instruments to minimise its own loss function. Since deviating from the

output target is costly, it will set d_s equal to the deficit target[14] and use i for stabilisation purposes.

If the government pursues « pure » stabilisation ($G'= 0$), in equilibrium the output gap is zero but, in absence of a nominal anchor, the inflation rate is undetermined. If the government pursues a positive output gap ($G'>0$), it will keep lowering i in the attempt to push output beyond its natural level. Since i cannot be lowered below zero, from equation (1) we obtain:

$$\frac{\phi_1}{\phi_2} d_s^{'} - \frac{(1+\phi_1\alpha)G^{'}}{\phi_2} + \pi^e + \frac{\varepsilon_1}{\phi_2} = 0 \tag{18}$$

Hence, in « equilibrium », the inflation rate is the following:

$$\pi = -\frac{\phi_1}{\phi_2} d_s^{'} + \frac{(1+\phi_1\alpha)}{\phi_2} G^{'} \tag{19}$$

Under monetary dominance, the interest rate is kept fixed at its equilibrium level and the budget deficit is used by the central bank to achieve the inflation target. If the central bank sets a sufficiently low fiscal target, fiscal policy will never be constrained. Output and inflation will be stabilised perfectly under demand shocks while supply shocks will show up in an equivalent change in the output gap with no impact on inflation.

Table 3 summarises the main results of the analysis. Inflation and output under monetary dominance are identical to the Nash solution without interest rate smoothing (β = 0), with the difference that it is the fiscal instrument and not the interest rate that is used to stabilise inflation. In the case of demand shocks, monetary dominance and fiscal dominance provide more macroeconomic stabilisation than Nash. The reason is that, unlike the Nash solution, one policy instrument (i under fiscal dominance and d_s under monetary dominance) can be used freely to offset perfectly the shock.

[14] In fact, given the availability of the interest rate to stabilise output, the government can set d_s at its «true» preference and not at the SGP-compatible level.

Table 3

Output and inflation stabilisation under various regimes

	Monetary dominance	Fiscal dominance $(G^{'}=0)$	Nash $(\beta>0)$	Nash $(\beta=0)$
G	ε_2	0	$\frac{\beta\omega^2(1+\phi_1\alpha)\varepsilon_1+\phi_2^2\varepsilon_2}{\phi_2^2+\beta\omega^2\left[(1+\phi_1\alpha)^2+\theta\phi_1^2\right]}$	ε_2
π	0	$\pi^e-\frac{\varepsilon_2}{\omega}$	$\frac{\beta\omega\left\{(1+\phi_1\alpha)\varepsilon_1-\left[(1+\phi_1\alpha)^2+\theta\phi_1^2\right]\varepsilon_2\right\}}{\phi_2^2+\beta\omega^2\left[(1+\phi_1\alpha)^2+\theta\phi_1^2\right]}$	0

What conclusions can be drawn on the incentives of monetary and fiscal authorities to cooperate?

Clearly, if the government aims at attaining a positive output gap, there is no incentive for an inflation-conservative central bank – as the ECB is mandated to be - to engage in cooperation because it would have to accept an inflation bias in equilibrium. Notice however that, in general, there is a trade-off between the inflation and the deficit bias because the use of the interest rate to stimulate demand would partly take the place of the rise in the deficit. To the extent that, under non-cooperation, a high deficit bias leads to a unsustainable accumulation of public debt, the central bank would face an unpalatable choice between higher inflation now (to reduce the deficit bias) and (debt monetisation and hence) higher inflation in the future.

If the government pursues «pure» cyclical smoothing, under no shocks, the Nash equilibrium and the cooperative equilibrium both imply G= 0 and π = 0. Hence, the incentives for cooperation depend on welfare gains and losses in response to shocks.

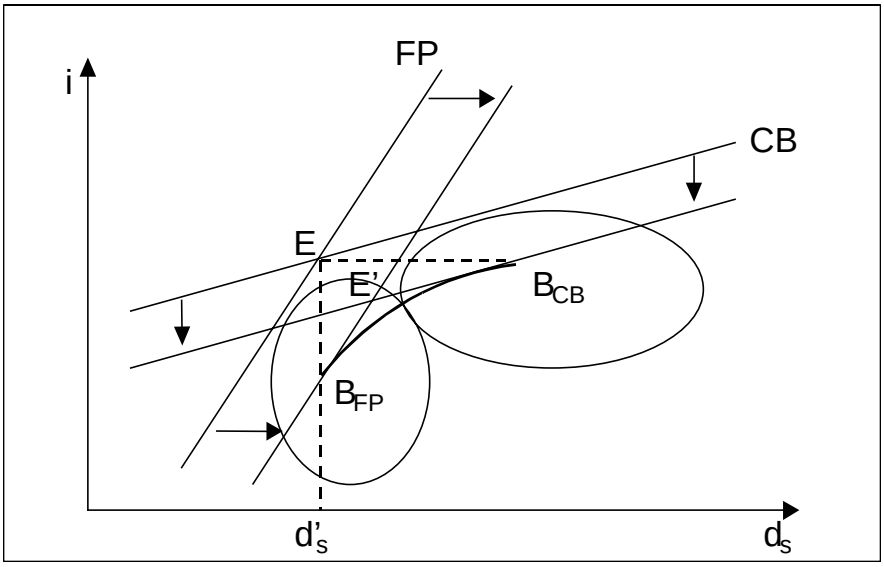
Under demand shocks, as both policies move in the same direction the gains from cooperation are ambiguous. This is illustrated in graph 2 which pictures the policy reactions to a negative demand shock. Both policies are restrictive and the new Nash equilibrium is E'. The Bliss points for the two authorities are indicated by B_{FP} and B_{CB}: ideally, as discussed before, each authority would prefer the whole stabilisation be borne by the other authority. The line between the two Bliss points is the contract coordination line. As shown in the graph, E' is very close to such line, indicating that any gain from coordination for both authorities, even if positive, is necessarily minor and could be even negative if the coordination process involves "transaction costs".

In the case of supply shocks, since under Nash the two policy instruments move in opposite directions, there are unambiguous gains from cooperation. This can be easily understood since, in the non-cooperative solution, part of the change in the interest rate occurs in order to offset the change in the opposite direction in the budget deficit. This additional change in the interest rate, K, is given by :

$$K = -\frac{\phi_1^2 \phi_2 \varepsilon_2}{(1+\phi_1\alpha)\left\{\phi_2^2 + \beta\omega^2\left[(1+\phi_1\alpha)^2 + \theta\phi_1^2\right]\right\}} \tag{20}$$

Graph 2

Negative demand shock



This result is illustrated in Graph 3 which shows the policy reactions to a negative supply shock. Given the policy preferences of the central bank, the latter would like fiscal policy to turn restrictive to keep inflation under control. Conversely, the government would like to see no change in the interest rate so that all the shock will feed through into higher inflation[15]. Instead, under no cooperation, each authority moves in the opposite direction to that hoped for by the other authority. As shown in the graph, the degree of output and inflation stabilisation implied by non-cooperation could be achieved at lower values of both policy instruments[16].

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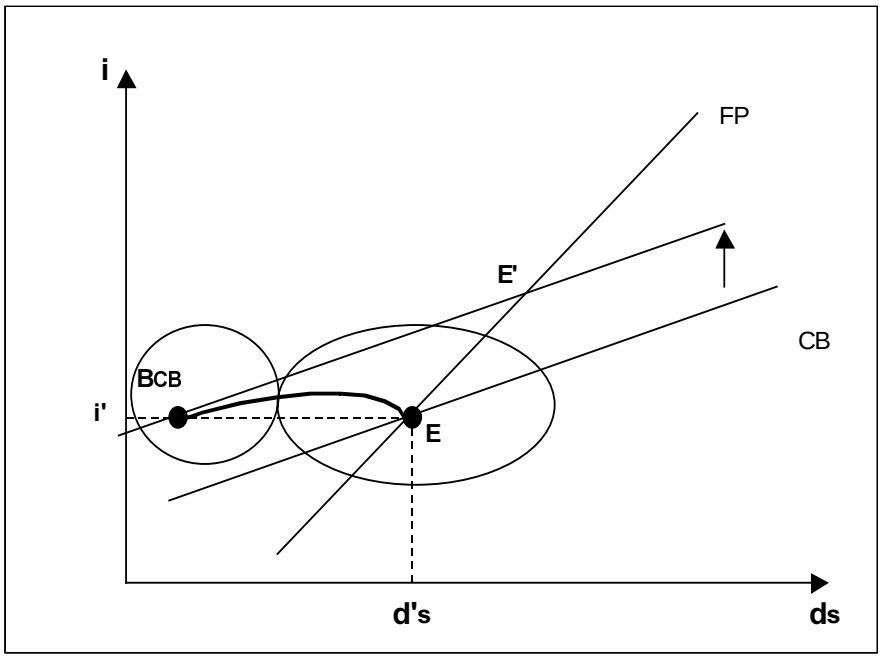
[15] Notice that FP's reaction function is not directly affected by the supply shock. This implies that the original equilibrium under no shocks (E in graph 3) remains the preferred position for the fiscal authority. Under more general assumptions on the IS equation or FP preferences (including an inflation term), FP's reaction function would shift to the right and so would the new Nash equilibrium. Obviously, the conclusions in the text remain unchanged.

[16] It is easy to show that the Stackelberg solution entails values of the policy variables intermediate between Nash and cooperation. See, Bennett and Loayza (2000).

Graph 3

Negative supply shock



Given interest rate smoothing in CB and the deficit target in FP, this implies a welfare gain for both authorities. Cooperation also implies a lower likelihood to shift in the fiscally-constrained regime.

The empirical investigation in Section 5 provides support for these conclusions.

5. Illustration of policy interactions with the QUEST model

The present section attempt to provide some quantitative evidence on the some of the effects derived in sections 3 and 4. We use a 2-country version of the DG ECFINs QUEST model to capture the quantitative importance of fiscal-monetary policy interactions. The model we use can be characterized as a modern version of a neoclassical Keynesian synthesis model. This means behavioural equations of households and firms are

derived from explicit dynamic optimisation problems subject to budget constraints and adjustment costs. Monetary policy is effective because of sluggish price adjustment in the goods market due to price adjustment costs of monopolistically competitive firms (see, for example Rotemberg (1982, 1996) and Hairault and Portier (1992)) and the nominal wage response is delayed because of overlapping one year contracts[17].

Both the fiscal authorities and the monetary authorities set their policy instruments to minimize their respective loss functions. As the empirical model used here is a dynamic model, the focus is on the impact responses of the shocks, to stay close to the theoretical analysis above. This implies that both the fiscal authorities as well as the monetary authorities face a high rate of time preference, optimise their respective responses over the short run and discount the medium to long term effects more heavily. Another difference with the theoretical model is that here the policy response of the monetary authorities is not formulated in terms of interest rates but in terms of the money supply. This is inconsequential since both instruments are linked via a stable money demand equation in the model. The instrument for the fiscal authorities is government expenditure *g*.

The underlying utility function correspond to the specification in the theoretical section. In particular we assume that fiscal policy does not care about inflation and monetary policy puts zero weight on output stabilisation. Also in order to mimic as closely as possible the stabilisation motive of both policy makers we assume a high discount rate. Monetary policy sets the money supply *m* so as to minimize the following loss function:

$$L(CB_t) = \sum_{i=t}^{\infty} \delta^i \left(\pi_i^2 + \beta (i_i - i_{i-1})^2 \right) \tag{21}$$

where δ is the rate of time preference, π_t is inflation, i_t the nominal interest rate and β the weight given to interest rate smoothing. The fiscal authorities set their instrument, government consumption *g*, to minimize the following loss function:

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[17] For a description of the basic structure of the model and its parameter values, see Roeger, in't Veld and Woehrmann (2001). The version used here allows for overlapping wage contracts and sluggishness in prices with firms facing quadratic price adjustment costs per unit of output (see Roeger (1999)).

$$L(FP_t) = \sum_{i=t}^{\infty} \delta^i \left\{ \left(Y_i - \overline{Y} \right)^2 + \gamma (d - \overline{d})^2 \right\} \tag{22}$$

where $Y - \overline{Y}$ is the output gap, $d - \overline{d}$ the deficit deviation from target and γ the weight given to the deficit target. Here we deviate from the theoretical model by explicitly specifying a debt rule which guarantees fiscal solvency.

$$\Delta g_t = f_1 \left(b_0 - B_t / Y_t \right) - f_2 \Delta (B_t / Y_t) \tag{23}$$

In order to simplify the optimisation problem faced by fiscal policy, the parameters f_1 and f_2 of that rule are not set optimally but only act as a constraint on a government which accepts responsibility for budget sustainability. This is a mild form of the SGP and captures the "close-to-balance" rule. However, the debt rule as specified in this paper will not automatically guarantee that fiscal policy will meet the deficit target for all shocks. In cases where the deficit target is violated in the experiments conducted below we will both look at an unconstrained as well as a constrained optimisation problem.

Non cooperation

Given the dynamic complexity as well as non linearity of the model it is impossible to derive explicit decision rules for monetary and fiscal policy. Here we briefly describe how the reaction functions are derived in this paper.

Let T_t be a vector of target variables, X_t a vector of instruments, S_t a vector of state variables and ε_t a vector of exogenous shocks, then in a linear approximation, the target variables can be expressed as follows:

$$T_t = a_s S + a_x X_t + a_\varepsilon \varepsilon_t \tag{24}$$

In general the instruments, when set optimally, will be related to both the state of the economy and exogenous shocks

$$X_t = b_s S_t + b_\varepsilon \varepsilon_t \tag{25}$$

and the parameters will be complicated functions of both the structural parameters of the model and the preferences of policy makers. To find the optimal policy response it is easier if X_t can be expressed as a function of

the shocks only. Using the fact that for any covariance stationary process there exists a moving average representation, the state variables can be expressed as a moving average of current and past shocks:

(26) $$S_t = c(L)\varepsilon_t .$$

This can be used to express the instruments as functions of shocks only as follows:

(27) $$X_t = d(L)\varepsilon_t .$$

Optimisation therefore requires selecting parameters such that the fiscal and monetary objective function is minimised. Computationally this is a complicated problem since the dimension of the parameter set is not known a priori. In order to economize on the search we assume that the MA process can be approximated by an ARIMA representation, which, in the case of the monetary policy rule only involves lagged money and current shocks. In the case of fiscal expenditure, the response is restricted to current innovations, besides the response implied by the sustainability constraint. Thus the general form of the rules over which we optimize is given by:

(28) $$m_t = m_{t-1} + c_2\varepsilon_1 + c_3\varepsilon_2$$

(29) $$g_t = \bar{g} - f_1(b - b_0) - f_2\Delta b + f_3\varepsilon_1 + f_4\varepsilon_2$$

Given the standard money demand equation in the model, this rule can be rewritten in terms of an interest rate rule as follows:

(28a) $$\Delta i_t = \frac{1}{\varphi}(\Delta y_t + \Delta\pi_t) - c_2\varepsilon_{1t} - c_3\varepsilon_{2t}$$

where φ denotes the semi-interest elasticity of real balances with respect to nominal interest rates. As can be seen from this expression, the optimal rule comes close to a Taylor rule formulated in first differences and equal weights given to both output growth deviations from trend[18] and inflation. However, according to the optimal rule the central bank takes into account the source of the shock. In the case of a positive/negative demand shock it will increase/lower interest rates more than implied by changes in GDP and

[18] Notice, since all variables in the model are defined in efficiency units, the growth rate of y must be interpreted as deviation from its long run trend as defined by the growth rate of TFP and population.

inflation while in the case of a positive/negative supply shock monetary policy will be less/more restrictive than implied by the Taylor rule.

For the demand and supply shocks we assume that the demand shock is a temporary shock to consumption, ex-ante 1 per cent of GDP in the first quarter, which is phased out in following quarters. The supply shock is a persistent technology shock, of similar magnitude of 1 per cent of GDP. Since a persistent technology shock leads to a new long run level of potential GDP, the question therefore arises whether fiscal policy[19] should target the historic or future potential output. We assume in this analysis that fiscal policy targets the historic level of potential output. Given the high discount rate, the government is mainly interested in short run stabilisation. An immediate move towards the new potential output target would be counterintuitive, since the short run perspective of the government would force fiscal policy to adjust output strongly towards the new lower level. This would be inconsistent with the notion that the output gap term in the utility function represents an output smoothing motive for fiscal policy. Finally it must be noted that for less persistent supply shocks the first year response of the model economy would not differ qualitatively from a permanent shock. For the given specifications of the loss functions and for the types of shocks considered here, the following monetary and fiscal reaction functions for the Nash equilibrium are obtained in the unconstrained regime:

$$g_t = \bar{g} - 0.04(b - b_0) - 0.05\Delta b - 0.3\varepsilon_1 - 3.0\varepsilon_2 \tag{30}$$

$$m_t = m_{t-1} - 0.000125\varepsilon_1 + 0.025\varepsilon_2 \tag{31}$$

Graphs 4 and 5 illustrate the fiscal and monetary reaction functions under negative demand and supply shocks respectively and Table 4 gives the corresponding welfare looses for both authorities under the Nash solution.

The response parameter for a demand shock is negative. In the case of a negative consumption shock, $\varepsilon_1 < 0$, the fiscal authorities respond by raising expenditure to boost output. The monetary authorities respond by offsetting the deflationary impact of this shock and raise the money supply and reduce interest rates, which will also stimulate domestic demand. Thus, under demand shocks, both policies move in the same direction and if one

[19] Notice, monetary policy does not target output at all.

authority does more, the other has to do less. This is illustrated in Graph 4 which depicts the optimal settings of the respective response parameters for the monetary and fiscal authorities under this particular shock. On the vertical axis, the size of the monetary reaction is given, where a smaller negative value represents a smaller monetary expansion or higher interest rates. The horizontal axis gives the absolute value of the fiscal response parameter and a larger parameter implies a larger increase in government expenditure and a larger deficit. If the response of the fiscal authorities becomes stronger and they raise expenditure by more, the monetary authorities can reduce the size of the monetary loosening. Thus, in Chart 3, the CB reaction function is upward sloping. If the central bank reacts more strongly to the negative demand shock and raises the money supply by more, that will help to prop up output again and the fiscal authorities will have to do less. Thus the FP reaction curve is also upward sloping. The FP reaction curve is steeper than the CB curve, consistent with the analysis in section 3 (footnote 10).

In case of a negative supply shock, $\varepsilon_2 < 0$, monetary and fiscal policies go in opposite directions. The response parameter for a supply shock is positive in the monetary reaction function. Monetary policy contracts to offset the inflationary impact of this negative technology shock and the central bank raises interest rates. The fiscal authorities respond by increasing government expenditure to prop up output (i.e. negative coefficient). The policy responses now move output and inflation in opposite directions . The CB reaction reduces output even further and fiscal policy responds by raising expenditure even more. Hence in Graph 5 the FP reaction curve is upward sloping. If the fiscal authorities react more strongly and increase expenditure, than the monetary authorities will react to the additional inflationary pressure by a further monetary tightening. Thus the CB curve is also upward sloping.

The Nash solution is then determined by the intersection of the CB and FP reaction curves. The policy parameters and their corresponding welfare losses are given in Table 4.

In case of the demand shock, fiscal and monetary authorities are able to stabilise output and inflation. The rise in the deficit remains small and well within the limits of the SGP. However, under the particular supply shock given here, the Nash equilibrium in this optimisation game, with this inflation-conservative central bank that stabilises inflation immediately, implies a large response of the fiscal authorities. The optimal fiscal

Table 4

Policy responses under negative supply and demand shocks

	Negative Supply shock (1% of GDP)		Negative Demand shock (1% of GDP)	
a. Nash optimal response :				
Fiscal policy parameter	f_4 = -3.0		f_3 = -0.30	
Monetary policy parameter	c_3 = 0.025		c_2 = -0.000125	
	FP:	CB:	FP:	CB:
	47.40755	0.06552	0.01081	0.00029
Effect on:				
GDP	-1.40		0	
Inflation	0.14		0	
Deficit	3.8		0.11	
b. **Nash optimal response – constrained fiscal policy**:				
Fiscal policy parameter	f_4 = -2.0			
Monetary policy parameter	c_3 = 0.025			
	FP:	CB:		
	46.19591	0.04868		
Effect on :				
GDP	-1.48			
Inflation	0.10			
Deficit	2.76			

Note: Monetary reaction function: $m_t = m_{t-1} + c_2\varepsilon_1 + c_3\varepsilon_2$

Fiscal reaction function: $g_t = \bar{g} - f_1(b - b_0) - f_2\Delta b + f_3\varepsilon_1 + f_4\varepsilon_2$

response in this setting would mean that the deficit would exceed the SGP limit of 3%. The 3% deficit limit under this shock implies the fiscal response parameter could not exceed the range of 2-3.5 as indicated by the dotted line in Graph 5.

Thus, the SGP constrained optimum lies far to the left of the Nash solution with a lower fiscal response to the shock and an also slightly lower monetary response. As shown in Table 4, the implied output gap in the constrained case is larger than under the Nash (FP loss exceeds that under the Nash) while inflation is lower (CB loss smaller). In terms of welfare losses, CB gains a lot from the deficit constraint and the CB loss is reduced to a quarter of that under the Nash solution, while the additional loss of FP is relatively small.

Cooperation

Under demand shocks, monetary and fiscal policies move in the same direction and from the theoretical analysis it is not unambiguously evident whether both parties would gain from cooperation. It was shown above that the fiscal and monetary authorities are able to stabilise output and inflation in this scenario and the respective welfare losses are relatively small. With the deficit entering the FP loss function, a larger fiscal policy response increases the fiscal welfare losses and no improvement relative to the Nash solution can be achieved where both parties would be better off.

In case of a negative supply shock, both parties are unambiguously better off under cooperation. Policies move in opposite directions and part of the monetary tightening occurs in order to offset the effects of the fiscal expansion and vice-versa (see eq. 20). Thus both authorities can gain from reacting less. When the fiscal authorities reduce the size of the expansion and the central bank tightens less, both FP and CB are better off. In Graph 5, there is a whole region below and to the left of the Nash outcome where both FP and CB gain from coordination. The example given here raises the deficit to 1.5 per cent of GDP. Both CB and FP benefit from coordination, but relative to the unconstrained Nash outcome, the gain for CB is largest, as the fiscal response is reduced by most. It is important to bear in mind that these results of positive gains from coordination hold only under these specific scenarios. It is assumed in this exercise that fiscal authorities do not target an output level beyond the natural level and no inflation bias arises.

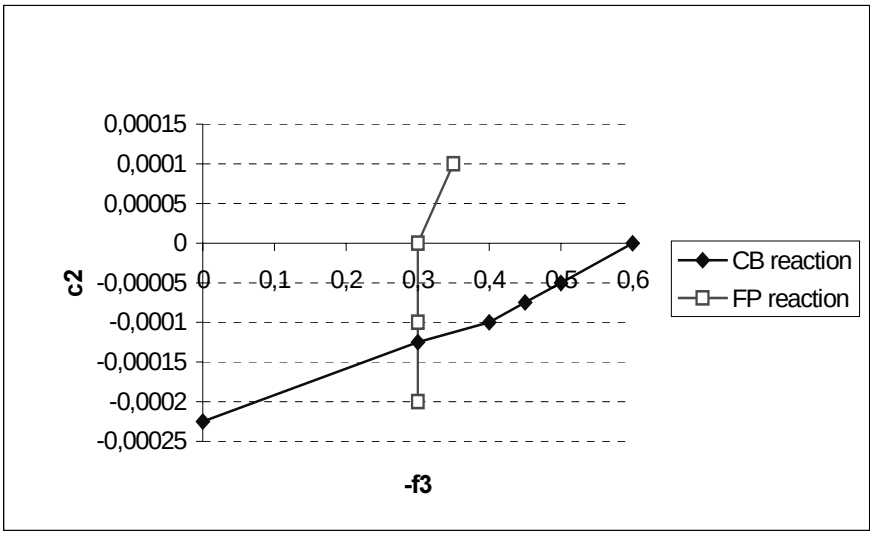
Table 5

Example of welfare improving policy coordination under negative supply shock

Fiscal policy parameter	f_4 = -1.0	
Monetary policy parameter	c_3 = 0.02	
	FP:	CB:
	39.96268	0.04230
Effect on :		
GDP	-1.35	
Inflation	0.16	
Deficit	1.51	

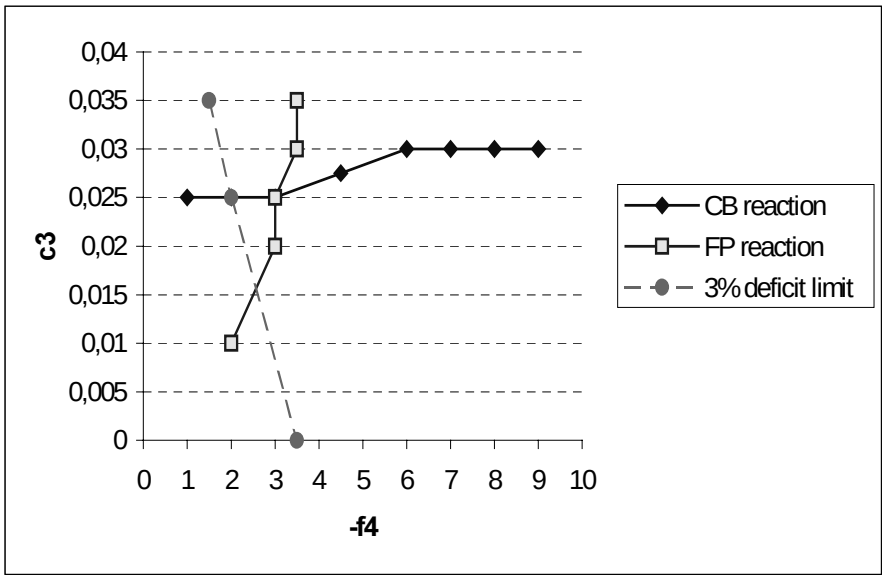
Graph 4

Optimal Policy response – Negative Demand shock



Graph 5

Optimal Policy response – Negative Supply shock



Note: Monetary reaction function: $m_t = m_{t-1} + c_2\varepsilon_1 + c_3\varepsilon_2$

Fiscal reaction function: $g_t = \overline{g} - f_1(b - b_0) - f_2\Delta b + f_3\varepsilon_1 + f_4\varepsilon_2$

6. Conclusions

This paper has looked at the interactions between monetary and fiscal authorities, when fiscal policy is constrained by upper limits on the budget deficits, as in EMU.

Conflicts between monetary and fiscal policy arise when the central bank's objective function differs from that of fiscal authorities. This is generally assumed in the literature. In particular it is assumed that the fiscal authority has less incentive to stabilise inflation, while inflation stabilisation is the most important goal of the central bank. Also different degrees of output stabilisation as well as different output targets can be consistent with the objectives of both authorities. In this paper it has been

assumed that the central bank adheres to strict inflation control and attaches zero weight to output stabilisation, however the central bank also tries to smooth nominal interest rates. The latter element is introduced since, first, there is sufficient empirical evidence in its favour and, second, it restricts the power of monetary policy with respect to neutralising demand shocks and allows for more interesting policy interactions.

For fiscal policy it is assumed that the government does not care about inflation but only about output stabilisation (around a level which can be higher than the natural rate). The SGP introduces an additional constraint on fiscal policy. This constraint is introduced in the model via the objective function which penalises deficits which deviate from the "close-to-balance" target of the SGP. The government does not necessarily choose a deficit target that would (for given stabilisers) never violate the Maastricht threshold because it faces a trade off between the loss of utility in normal times from a deficit that is set lower than required under solvency and the cost of violating the 3% limit by not setting the target low enough in case of large negative shocks.

Because of this trade-off, fiscal policy will - depending on the size of shocks - operate under two different regimes. Under the fiscally-unconstrained regime, the government chooses instruments in order to maximise its objective function. Under the fiscally-constrained regime, the choice of the fiscal instrument is dictated by the Maastricht deficit limit.

Within this theoretical framework, we analysed how do parameters of fiscal and monetary policies and the preferences of the central bank affect the response of output and inflation to shocks.

The main results of the theoretical analysis are summarised hereafter.

Under *non-cooperation,* demand shocks affect output and inflation only insofar as the central bank smoothes the interest rate. The central bank prefers high fiscal stabilisation under demand shocks and low fiscal stabilisation under supply shocks; conversely, the government would like to see low interest rate smoothing under demand shocks and high smoothing under supply shocks. Given the move of policies in opposite directions, under negative supply shocks there is a higher likelihood to shift into the fiscally-constrained regime. If fiscal authorities target a positive output gap, there is a "deficit bias" in equilibrium. However, under non-

cooperation, since the central bank does not aim at pushing output beyond its natural level, there is no "inflation bias".

Under *cooperation,* if fiscal authorities pursue a positive output gap, there is in equilibrium an "inflation bias" and a "deficit bias", though the latter is lower than under Nash. If the government only pursues "pure" cyclical stabilisation, the gains from cooperation are ambiguous and necessarily small under demand shocks, but there are positive gains from coordination under supply shocks. This implies that, provided that the objective of the government is output stabilisation around its natural level, policy coordination may be looked at as an insurance against future shocks.

Our simulations with the QUEST model lend support to these theoretical predictions. It is shown that the Nash solution, under a sufficiently severe negative supply shock, implies a violation of the deficit threshold. The simulations also confirm that there are positive gains from coordinating the policy response to supply shocks.

These results help to shed light on a number of issue which have been raised in the academic and policy debate.

It has been shown that the substitutability or complementarity between monetary and fiscal policies crucially depends on the type of shocks hitting the economy. In the event of supply shocks, the two policies move in opposite direction : a loosening (tightening) of fiscal policy goes hand in hand with a tightening (loosening) of monetary policy. Hence there is a clear conflict between the two arms of macroeconomic policy. The empirical observation, however, of a policy substitutability does not imply necessarily a conflict. For instance, as mentioned above, a relaxation of monetary policy during periods of budgetary consolidation – as in the EU during the 1990s - may actually imply "implicit" coordination: by helping to cushion the output losses due to the budgetary retrenchment, the expansionary monetary policy facilitates the task of fiscal authorities[20]. Under demand shocks, both policies move in the same direction, but if one does more, the other one does less. In this case, there exists a sort of "distributional" conflict between monetary and fiscal authorities on how to share the burden of stabilisation.

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[20] The SGP has been interpreted by Allsopp and Vines (1996, 1998) as a “commitment technology” by EMU members to bring a monetary relaxation which would reduce the costs of consolidation. As argued in EC (1999) and Buti and Martinot (2000), confirmation of the commitment to fiscal prudence contributed to trigger an accommodating monetary response by the ECB in the first year of EMU.

Our results may provide a rationale for the traditional central banks' aversion for "ex ante" coordination of macroeconomic policies. This reluctance was expressed forcefully in a recent speech by Otmar Issing, chief economist of the ECB (Issing, 2000): «(N)ot much can be expected from attempts to coordinate these macroeconomic policies ex ante (…). On the contrary, such attempts give rise to the risk of confusing the specific roles, mandates and responsibilities of the policies in question». And later: «if there is already an *efficient* initial assignment of responsibilities in place, which does take into account the individual policy-makers' objectives and actions, calls for policy coordination (…) would not be necessary. To put it simply, an efficient initial assignment of objectives and responsibilities will largely substitute the need for coordinated policies later on».

As shown above, if fiscal authorities target an output beyond the natural level, under cooperation, an inflation bias will arise in equilibrium. This is likely to put off any incentive for policy coordination by an inflation-conservative central bank, whatever the possible gains from it in responding to shocks. However, if budgetary authorities only pursue cyclical stabilisation, the Nash and the cooperative solutions are identical under zero shocks and no deficit or inflation biases arise in equilibrium. Hence, under no shocks, there are "no risks" from cooperation for the central bank. Therefore, the benefits of coordination have to be assessed by looking at the response to shocks under Nash and cooperation. Our analysis points to gains from coordinating monetary and fiscal policies in response to shocks. If policy coordination is viewed as insurance against future shocks, there seems to be good case for entering into a contract between monetary and fiscal authorities to provide an optimal response to shocks.

Obviously, this conclusion does not consider other factors such as the existence of "transactions" costs of implementing coordination or the fact that supply shocks – especially if long lasting - should be dealt with via structural reforms and microeconomic adjustment rather than macroeconomic stabilisation. To the extent that central bank's reluctance in engaging in coordination is justified by "suspicion" on the real objectives of fiscal authorities, "soft coordination" helping to understand each other's targets, identify the type of shocks, achieve a common view on the output gap, would certainly be beneficial. It could also pave the way to stronger forms of coordination down the road.

The analysis in this paper is subject to obvious limitations, starting with the extremely simplified structure of the model and policy

preferences. We look at an a-temporal equilibrium and do not explore the dynamics of the response to shocks or to changes in policy preferences. For instance, an inter-temporal trade-off may arise between inflation bias and deficit bias. Also, having chosen the interest-inclusive budget balance - instead of the primary balance - as a control variable has cut off an important channel of policy interactions. In the empirical section, the way in which the reaction functions of monetary and fiscal authorities have been derived deserves further investigation. Finally, as the analysis encompasses only one fiscal authority, one should be cautious in deriving direct policy conclusions for EMU.

REFERENCES

van Aarle, B., J.C. Engwerda, J.E.J. Plasmans and A. Weeren (2000), "Monetary and Fiscal Policy Design under EMU: A Dynamic Game Approach", CESifo Working Paper, No. 262.

Allsopp, C. and D. Vines (1996), "Fiscal Policy and EMU", *National Institute Economic Review*, No. 158, pp. 91-107.

_____ (1998), "Macroeconomic Policy after EMU: The Assessment", *Oxford Review of Economic Policy*, 14 (3), pp. 1-23.

Artis, M.J. and M. Buti (2000a), "'Close to Balance or In Surplus' - A Policy Maker's Guide to the Implementation of the Stability and Growth Pact", *Journal of Common Market Studies,* forthcoming.

_____ (2000b), "Setting Medium Term Fiscal Targets in EMU", mimeo, July.

Beetsma, R. (2000), "Does EMU Need a Stability Pact", mimeo, October.

Beetsma, R. and H. Uhlig (1999), "An Analysis of the Stability and Growth Pact", *Economic Journal*, No. 109, pp. 546-71.

Buti, M., D. Franco and H. Ongena (1998), "Fiscal Discipline and Flexibility in EMU: the Implementation of the Stability and Growth Pact", *Oxford Review of Economic Policy*, 14 (3), pp. 81-97.

Buti, M. and B. Martinot (2000), "Open Issues in the Implementation of the Stability and Growth Pact", *National Institute Economic Review*, No. 174, pp. 92-104.

Canzoneri, M.B. and B.T. Diba (2000), "The Stability and Growth Pact: A Delicate Balance or an Albatross?", October, mimeo.

Chari, V.V. and P.J. Kehoe (1998), "On the Need for Fiscal Constraints in a Monetary Union", Working Paper No. 589, Federal Reserve Bank of Minneapolis.

Clarida, R., J. Galí, and M. Gertler (1999), "The Science of Monetary Policy: A New Keynesian Perspective", *Journal of Economic Literature*, XXXVII, pp. 1661-707.

Cooper, R. and H. Kempf (2000), "Designing Stabilization Policy in a Monetary Union", NBER Working Paper, No. 7607.

De Grauwe, P. (2000), "The Challenge of Monetary Policy in Euroland", paper presented at the 2000 Flemish Conference "EMU: The Challenge".

Demertzis, M., A.J. Hughes Hallett and N. Viegi (1999), "An Independent Central Bank Faced with Elected Governments", CEPR D.P. 2219.

Dixit, A. (2000), "Games of Monetary and Fiscal Interactions in the EMU", Working Paper, Princeton, August.

Dixit, A. and L. Lambertini (2000a), "Symbiosis of Monetary and Fiscal Policies in a Monetary Union", Working Paper, Princeton and UCLA, March.

_____ (2000b), "Fiscal Discretion Destroys Monetary Commitment", Working Paper, Princeton and UCLA, August.

_____ (2000c), "Monetary-Fiscal Policy Interactions and Commitment Versus Discretion in a Monetary Union", Working Paper, Princeton and UCLA, August.

Eichengreen, B. and C. Wyplosz (1998), "Stability Pact - More than a Minor Nuisance?", *Economic Policy*, No. 26, pp. 65-114.

European Commission (1990), "One Market, One Money", *European Economy*, No. 44.

_____ (1999), "Italy's Slow Growth in the 1990s: Facts, Explanations and Prospects", *European Economy-Reports and Studies*, No. 5.

_____ (2000), Public Finances in EMU- 2000, *European Economy - Reports and Studies*, forthcoming.

Favero, C. and R. Rovelli (2000), "Modeling and Identifying Central Banks' Preferences", mimeo, June.

von Hagen, J., A. Hughes Hallett and R. Strauch (2000), *Budgetary Consolidation in EMU*, a study for the European Commission, forthcoming.

Hairault, J.O. and F. Portier (1993). "Money, New-Keynesian Macroeconomics and the Business Cycle", *European Economic Review,* No. 37, pp. 1533-68.

Hughes Hallett, A. and N. Viegi (2000), "Central Bank Independence, Political Uncertainty and the Assignment of Instruments to Targets", mimeo, November.

Issing, O. (2000), "How to Achieve a Durable Macro-economic Policy Mix Favourable to Growth and Employment?", speech at the Conference on "Growth and Employment in Europe", European Commission, Brussels, May.

Leitmo, K. (2000), "Strategic Interactions between the Fiscal and Monetary Authorities under Inflation Targeting", mimeo, September.

Leeper, E.M. (1991), "Equilibria Under Active and Passive Monetary and Fiscal Policies", *Journal of Monetary Economics*, No. 27, pp. 129-47.

Leith, C. and S. Wren-Lewis (2000), "Interactions between Monetary and Fiscal Policy Rules", *Economic Journal*, No. 110, pp. 94-108.

Levin, J.H. (1983), "A Model of Stabilization Policy in a Jointly Floating Currency Area", in J.S. Bhandari and B.H. Putnam (eds.), *Economic Interdependence and Flexible Exchange Rates*, MIT.

Mélitz, J. (1997), "Some Cross-country Evidence about Debt, Deficits, and the Behaviour of Monetary and Fiscal Authorities", CEPR Discussion Paper, No. 1653.

_____ (2000), "Some Cross-Country Evidence about Fiscal Policy Behaviour and Consequences for EMU", mimeo.

van den Noord, P. (2000), "The Size and Role of Automatic Fiscal Stabilisers in the 1990s and Beyond", OECD Economics Department Working Papers, No. 230.

OECD (1999), *EMU - Facts, Challenges and Policies*, Paris.

Roeger, W. (1999), "Output, Prices and Interest Rates over the Business Cycle*" Zeitschrift fur Wirtschafts -und Sozialwissenschafte,* No. 119, pp. 57-98.

Roeger, W., J. in't Veld and D.I.A. Woehrmann (2001), "Some Equity and Efficiency Considerations of International Tax Competition", *International Tax and Public Finance*, (forthcoming).

Rotemberg, J.J. (1982), "Sticky Prices in the United States", *Journal of Political Economy*, 90, pp. 1187-211.

Rotemberg, J.J. (1996), "Prices, Output and Hours: An Empirical Analysis based on a Sticky Price Model", *Journal of Monetary Economics,* 37, pp. 505-33.

Sims, C.A. (1999), "The Precarious Fiscal Foundations of EMU", September.

Woodford, M. (1995), "Price Level Determinacy Without Control of a Monetary Aggregate", *Carnegie-Rochester Conference Series on Public Policy*, 43, pp. 1-46.

Wyplosz, C. (1999), "Economic Policy Coordination in EMU: Strategies and Institutions", *ZEI Policy Paper,* B11.

THE CASE FOR SPENDING RULES

Philippe Mills[*] *and Alain Quinet*[**]

Introduction

According to the Stability and Growth Pact (SGP), European countries should achieve a budgetary position 'close to balance or in surplus' over the medium term while keeping the public deficit within the value of 3 per cent of GDP. The 'close to balance or in surplus' target is usually interpreted as applying to the cyclically-adjusted fiscal balance: the governments should let the automatic stabilisers operate freely, with discretionary policy being the exception rather than the norm. Such type of behaviour implies a substantial change compared to the past experience: empirical evidence indicates that European fiscal policies have tended to behave pro-cyclically. However, the 'close to balance or in surplus' target is a guideline rather than a rule as there is no process to sanction deviations from this objective.

Within the boundaries of the Maastricht Treaty and of the SGP, a number of European countries have complemented the SGP with multi-year frameworks. These frameworks are designed to ensure consistency between the SGP and the medium-term objectives for the debt and the government share in the economy. In addition they bring more discipline to fiscal policy-making during 'good times'.

The objective of the paper is to shed light on the usefulness of a medium-term framework anchoring fiscal policy on spending rules. Although it is widely recognised that expenditure-based fiscal retrenchments are more successful that tax-based consolidations (Alesina and Perotti, 1997; Zaghini, 1999), permanent spending rules have not retained much attention in the economic literature. We argue here that a spending rule curbs the tendency to relax fiscal policy during 'good times', hence preserving the free operation of automatic stabilisers on the revenue side. The first section of the paper discusses to what extent a stable cyclically-adjusted position – 'close to balance or in surplus' - can be seen as a relevant target for fiscal policy. In a second section, we draw the

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lessons from the difficulty to adjust for the cycle in real time: a spending rule is more transparent than a cyclically-adjusted balance and more operationally targeted. The spending rule could be usefully inserted in a medium-term framework to ensure *ex post* compliance and to avoid excessive tax cuts during 'good times'. The framework should, in particular, specify how expenditure overruns should be clawed back in the following years and how 'growth dividends' and revenues overshoots should be used.

1. Cyclically-adjusted fiscal targets: a critical evaluation

The aim of the paper is not to review the various shortcomings of the cyclically-adjusted balance (see, for a comprehensive assessment, Blanchard, 1992; Chouraqui *et alii,* 1992 and Mackenzie, 1989), but to deal with the conceptual and technical difficulties the policy-makers in the European Union face in real time. A stable cyclically-adjusted balance may not be a relevant target given the difficulties to identify the type of shocks hitting the economy and to perform the cyclical adjustment.

1.1 From nominal to cyclically-adjusted balance targets

Balanced budget rules, or more generally nominal deficit targets, may be useful as temporary, strategic initiatives to aid the process of fiscal consolidation when the initial position of the public finances is weak (Kopits and Symanski, 1998). However, a balanced budget rule is at odds with the operation of automatic stabilisers and appears unsustainable in the event of a recession. The limits of nominal targets have induced policy-makers to shift more of less explicitly to cyclically-adjusted targets. Drawing the lessons of past failures, the cyclically-adjusted balance target meets two of the main requirements identified in the literature on fiscal rules: the rule can be applied on a permanent basis by successive governments; the rule is state-contingent, so as to give the authorities sufficient flexibility to react to unforeseen shocks. However, the rule fails to meet another requirement: it is neither simple to define nor easy to monitor in real time.

A stable cyclically-adjusted balance should normally indicate that the stance of fiscal policy has remained unchanged and that variations in

the budget balance reflect the impact of cyclical variations in economic activity. More specifically:

- the level of the cyclically-adjusted balance provides an idea of the room of manoeuvre to allow the operation of automatic stabilisers within the 3 per cent ceiling enshrined in the SGP;
- changes in the cyclically-adjusted balance indicate to what extent fiscal developments depart from the operation of automatic stabilisers.

In practice, targeting a stable cyclically-adjusted position - close to balance or in surplus – over the business cycle, with the idea of allowing automatic stabilisers to operate fully, raises several difficulties. Labelling the sensitivity of public deficits as 'automatic stabilisers' is ambiguous as the stabilisation properties of the budget depend on the nature of the underlying economic disturbances. Moreover, all technical approaches to adjust for the business cycle tend to suffer from a procyclical bias: they exhibit a positive correlation between the estimated cyclically-adjusted balance and the cycle.

1.2 The limits of cyclically-adjusted fiscal targets

1.2.1 Automatic stabilisation in the face of demand and supply shocks

A cyclically-adjusted target is based on the idea that automatic stabilisers should be allowed to operate freely in response to macroeconomic fluctuations and shocks. The automatic stabilisation of output almost always refers to the stabilisation of demand. In the face of a fall in aggregate demand, fiscal stabilisers unambiguously act as a shock absorber: the higher the automatic stabilisers, the more the output gap is stabilised. The conclusions are different, however, if the economy is affected by a supply shock. A temporary negative supply shock leaves long-term potential GDP unchanged, leading to deterioration in the output gap. Automatic stabilisers do smoothen output, but at the cost of higher inflation. A long-lasting supply shock leads to a fall in potential GDP. Hence, the cyclically-adjusted balance deteriorates, as public expenditures are rigid or indexed on higher prices, while potential GDP is falling. In this context, the automatic stabilisers delay the adjustment towards the new

Box : Cyclical Adjustment

In practice, the cyclical and cyclically-adjusted balance-to-GDP ratios (*bc* and bs respectively) are usually derived from the nominal balance (b) by a two-step procedure: an estimate of the output gap (og) and then of the sensitivity of tax and spending items to GDP□□□$_t$□and □$_g$ respectively*)*. The output gap reflects the deviation of actual GDP *(Y)* from a trend or potential GDP (*Yp*) as a share of GDP. Once the influence of the output gap has been removed, the cyclically-adjusted component is calculated as a residual. It provides an idea of the budget balance that would prevail under 'normal conditions'. Formally:

$$bs \cong (1+e_g og)g - (1-e_t og)t$$

with $t = T/Y$ the tax-GDP ratio and $g = G/Y$ the expenditure-GDP ratio $G = \bar{G}Y^{-e_g}$ and $T = \bar{T}Y^{e_t}$ where $\bar{G}$ and $\bar{T}$ are autonomous taxes and public expenditures.

If the output gap is equal to *0*, the cyclically-adjusted balance is equivalent to the nominal balance: *bs = g – t.* If the elasticity of public spending vis-à-vis GDP is equal to *0* and the tax elasticity equal to *1,* the cyclically-adjusted balance can simply be written: $bs \cong g - t(1-og)$ where *tog* represents the cyclical component.

Assuming a zero public spending elasticity, variations in the cyclically-adjusted balance (as a share of GDP) can be written as:

$$\Delta bs = \Delta b - \Delta bc = [(\Delta \bar{G}/\bar{G}_{-1}) - (\Delta Y_p / Y_{p-1})]\, g + (1-e_t)t\, (\Delta Y_p / Y_{p-1})$$

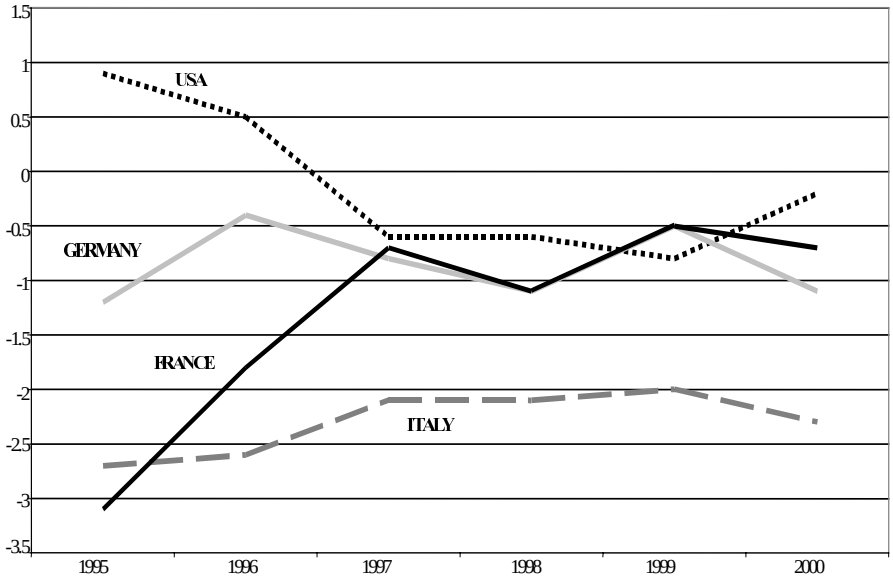
With a unitary tax elasticity (e_t *= 1*), variations in the cyclically – adjusted balance depend on the relative growth of public expenditures *vis-à-vis* potential GDP. The fiscal balance improves if the tax elasticity is above 1 (the so-called fiscal drag).

equilibrium level of potential output[1].

As it is very difficult to identify in real time the nature and the length of the shocks, the risk of treating changes in budget position that have structural roots as if they were the result of automatic stabilisers is high. This point is illustrated in Chart 1: an estimate of the output gap for the year 1995 made at the time is likely to be less reliable than one made five years later, given all the information that has become available in the intervening period.

Chart 1

Output gap for the year 1995



Source : OECD Economic Outlook (December 1995, 1996, 1997, 1998, 1999, 2000)

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[1] Fiscal policy may contribute to smooth supply shocks *via* a reallocation of public spending and taxes: income transfers may help to spread overtime the necessary but sometimes painful adjustment in relative prices; cutting the tax wedge on labour may impulse a positive counter supply shock to the economy. However, any attempt to prevent demand from falling in line with potential GDP, *via* deterioration in the public deficit, can become counterproductive.

1.2.2 Performing the cyclical adjustment

Various approaches have been developed to disentangle the cyclical and cyclically-adjusted components of public deficits. These approaches mainly differ with respect to the method used to identify the position of the economy in the business cycle. By contrast, the marginal sensitivity of the budget balance to GDP is very close from one estimation to another (Giorno *et alii,* 1995; Hagemann, 1999; Roger and Ongena, 1999). It is therefore generally considered that the main source of uncertainty surrounding the cyclical adjustment concerns the evaluation of the output gap. However, tax elasticities matter: they vary pro-cyclically during the business cycle, while the cyclically-adjusted budget balance is evaluated on the basis of an average long-term elasticity – generally close to unity.

1.2.2.1 The correlation between output gap and potential GDP

Two ways to identify the business cycle co-exist. A mechanical approach uses smoothing devices (such as Hodrick-Prescott filters) to establish a trend level of output, with the output gap representing the difference between actual and trend output. A production function approach provides an assessment of the level of GDP consistent with stable wage or price inflation. Various methods give widely different estimates of the output gap, mainly reflecting the uncertainties surrounding the estimation of the NAIRU. All tend to entail a positive correlation between potential output and the output gap.

Potential GDP based on a production function is procyclical as it captures the cyclical behaviour of the capital stock. In the long run, the capital/output ratio and the structural unemployment rate are constant; potential GDP growth only depends on labour efficiency gains and increases in the labour force. In the short run, however, the accumulation of capital during upswing raises potential GDP above its 'solovian path'. In this context, the investment cycle may lead to overstate the long-term potential GDP growth, increasing the risk of 'bad policies in good times'. The correlation between the output gap and the growth rate of the economy is more pronounced with the Hodrick Prescott (HP) filter. The symmetric property of the HP filter, which requires that output gaps sum to zero over the sample, tends to limit the absolute size of the output gap at the end of the period. The HP filter tends to mistake in part the strength of demand during upswings for an acceleration in potential GDP. Conversely, if the

end of the sample is characterised by a recession, the estimated trend will be lower.

1.2.2.2 The tax elasticity fluctuations

The income elasticity of budget items used to perform the cyclical adjustment reflects the average cyclical responsiveness of these items over the sample period. However, actual year-on-year sensitivity may differ substantially from this average responsiveness. More specifically, there is widespread evidence that tax elasticities are sensitive to the business cycle, with tax revenues falling more rapidly than GDP during a downturn and increasing more rapidly during an upswing. Direct taxes, in particular, react in a non-linear way to GDP variations, reflecting the volatility of the number of profitable firms and the progressiveness of the personal income tax. This is highlighted in the French case by the volatility affecting the aggregate tax elasticity for the central government - assuming unchanged legislation: for an average elasticity of 0.9, the standard deviation stands at 0.6. Variations are less pronounced at the general government level: for an average elasticity of 1, the standard deviation stands at 0.3 (see Chart 2).

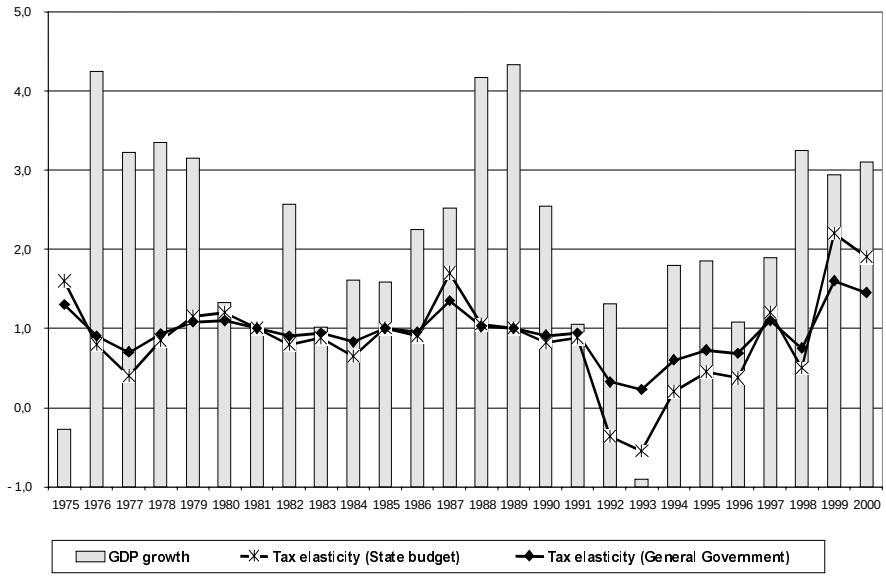
The size of the bias implied by a time-varying tax elasticity is given by the impact of the difference between the effective and the average tax elasticity used to perform the calculation. An improvement in the cyclically-adjusted balance, estimated on the basis of average tax elasticity, may be artificial if the rise in the tax burden is not due to new measures but to a transitory high elasticity. Conversely, if short-term elasticities tend to be pro-cyclical, a stable cyclically-adjusted balance may mask a deterioration in the underlying position of the public finances.

2. Anchoring fiscal policy on a spending rule

In this section, we draw the lessons from the conceptual and technical difficulties to adjust for the cycle. A spending rule is easier to define and monitor, while allowing the automatic stabilisers to work fully on the revenue side. For these reasons, several European countries such as the Netherlands, Finland, France, Sweden and the United Kingdom have turned more or less explicitly on spending rules. The credibility of the anchor is enhanced by the fact that a multi-annual budgeting framework forming part of the budgetary process supports it.

Chart 2

Tax elasticity and GDP growth



Source : Commission Economique de la Nation (2000) for the State budget. Calculations of the authors for the general government assuming a unitary tax elasticity for the other subsectors of the economy

2.1 The relevance of spending rules

Over the long run, the spending rule seems to dominate other rules, particularly deficit rules, for the following reasons:

- expenditure rules make governments accountable for what they can control directly;
- the rule allows the automatic stabilisers to operate fully and symmetrically on the revenue side. It contributes to macroeconomic stabilisation while minimising distortions – the traditional tax smoothing argument. A total spending norm may lead to pro-cyclical behaviour on the spending side, as a fall in interest rates or cyclically-sensitive spending items (mainly unemployment-related expenditures) may be accommodated with an increase in discretionary spending. However, as long as the main goal of the spending rule is to make sure

that objectives regarding the debt and the tax burden are mutually compatible, interest payments and unemployment benefits should remain in the control aggregate;

- he cap on expenditure growth can be set at different growth rates with reference to potential growth, according to preferences about the level of debt or the government share in the economy.

It is important to note that a spending rule is in essence close to a cyclically-adjusted balance target. Both aim at maintaining fiscal prudence while allowing the automatic stabilisers to work fully. The comparative advantages of spending rules are mainly practical: they are easy to define and monitor, hence minimising the risks of error or creative accounting in the short run[2]. However, a spending rule and a cyclically-adjusted balance target are mutually compatible over the medium run: an explicit medium-term target for the budget balance can supplement the spending rule.

2.2 Real versus nominal rules

Whether the spending norm should be expressed in nominal (as in the UK strategy) or in real terms (as in the Dutch or French strategy) mainly depends on the time horizon.

Over a short-term horizon, nominal rules may help fiscal stabilisation. If public expenditures are set in nominal terms, a positive demand shock or a negative supply shock automatically lead to a downward shift in public spending in real terms. This fall tends to stabilise both the output gap and the position of the public finances. By contrast, a rule set in real terms may be destabilising. The differences between nominal and real spending rules should not be overemphasised in face of demand shocks, as modern economies exhibit strong price inertia. In face of a surge in imported inflation (e.g. an oil price hike or a fall in the euro), by contrast, whether the rule is set in nominal or in real terms makes a difference. A nominal target seems preferable, but it requires a high degree of flexibility in real spending, notably wages and entitlements.

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[2] As highlighted in section 1, the uncertainties surrounding the growth rate of potential GDP are less pronounced than when one considers the level of the output gap, as long as the former is based on a prudent assessment (i.e. as long as the investment cycle is not included in the evaluation of long-run potential GDP). Therefore, setting a spending rule in relation to long-run potential GDP largely overcomes the problems raised by cyclical adjustment.

Over a medium term horizon, targeting the evolution of public spending in real terms makes more sense. The distinction between nominal and real spending rules seems *a priori* less relevant, as the norm is always implicitly based on an underlying assessment of trend inflation. The key issue is how to deal with surprises or forecast errors. If inflation forecasts are efficient (i.e. entail no systematic bias), the distinction between real and nominal expenditures is irrelevant, especially when the multi-year program permits overspending in one year if offset in the following years. However, if the effective inflation rate differs on average from the forecasts, the nominal rule may be difficult to sustain. A nominal-spending rule may stabilise the economy if the inflation rate differs from the initial path because of a long-lasting demand shock. If the inflation rate differs from the initial path because of a forecast error, a nominal-spending rule clearly destabilises the underlying position of the public finances.

2.3 Spending rules and internal stability pacts

Important areas of government activity are carried out by social security funds and by sub-national governments. Historically, legally binding balanced-budget rules have been enacted to restrain local deficits – with the stabilisation function generally carried out at the national or federal level. Restraining local deficits prevents externalities from fiscal misbehaviour in one jurisdiction from being transmitted, through higher interest rates, to other sub-national jurisdictions and to the national government. However, such rules create an incentive to offset by discretionary measures the operation of automatic stabilisers. As long as any significant decision-making responsibility for expenditures is devolved to local levels of government, the incentives could well be for them to spend excessively in good times, therefore undermining the credibility of a spending rule.

Hence, switching to a spending rule may requires to alter the incentives faced by social security funds and local authorities or to reach a broad-based agreement among public authorities enshrined in an ‘internal stability pact’. Two necessary conditions for an internal domestic pact are the effectiveness of the information system and the public nature of the arrangement. Monitoring *ex ante* and *ex post* compliance to the spending rule requires timely fiscal aggregates at the subnational level. In addition, the rules and the procedure should be made public. The implied increase in transparency and accountability would provide in turn an incentive for

public authorities to give more weight to the longer-term consequences of their decisions.

3. Conclusion

The basic argument in favour of a spending anchor is that a policy of targeting expenditures preserves microeconomic efficiency while allowing tax revenues to act as automatic stabilisers. We have argued that a spending rule is more transparent and easier to monitor than a cyclically-adjusted balance target.

A spending rule is a necessary but not a sufficient condition to secure the symmetric operation of automatic stabilisers. Controlling expenditures does not guard against deficits being created through excessive tax cuts. A spending rule may indeed have some asymmetric effect: while allowing the automatic stabilisers to operate fully during downturns, the rule does not guarantee that windfalls are used to 'reload the fiscal gun'. A fiscal framework anchored on a spending rule should include a medium-term target – typically a debt-to-GDP ratio - and 'contingent rules' to secure nominal surpluses during good times. Contingent rules should pre-establish how much of growth dividends or revenues overshoots are used to cut taxes or reduce the deficit.

REFERENCES

Alesina, A. and R. Perotti (1997), "Fiscal adjustments in OECD countries: composition and macroeconomic effects", IMF Staff Papers, Vol. 44, No. 2, pp. 210-48.

Blanchard, O.J. (1992), "Suggestions for a New Set of Fiscal Indicators", OECD Economics and Statistics Department Working Papers, No. 79.

Chouraqui, J.C., R. Hagemann and N. Sartor (1992), "Indicators of Fiscal Policy: A Reassessment", OECD Economics and Statistics Department Working Papers, No. 78.

Giorno, C., P. Richardson, D. Roseveare and P. van den Noord (1995), "Potential output, output gaps and structural budget balances", OECD Economic Studies, 24, pp. 167-209.

Hagemann, R. (1999), "The structural Budget Balance: the IMF's Methodology", IMF Working Paper, 99/95.

Kopits, G. and S. Symansky (1998), "Fiscal Policy Rules", IMF Occasional Paper, 162.

Mackenzie, G.A. (1989), "Are all Summary Indicators of the Stance of Fiscal Policy Misleading?", IMF Staff Papers, Vol. 36, No. 4, pp. 743-70.

Roger, W. and H. Ongena (1999), "The commission services' cyclical adjustment method", in *Indicators of structural budget balances,* Rome, Banca d'Italia.

Zaghini, A. (1999), "The economic policy of fiscal consolidations: the European experience", Temi di Discussione, No. 355, Rome, Banca d'Italia, June.

BALANCED BUDGET VERSUS GOLDEN RULE: ON THE REMEDIABILITY OF FISCAL RESTRICTIONS

*Wolfgang Föttinger**

> "The change in net worth is the preferred measure for assessing the sustainability of fiscal activities".
>
> *International Monetary Fund (2000: 4.44)*

1. Introduction

The sector general government in Germany in 2000 recorded Euro 36.2 bn for gross investment expenditure while depreciation of fixed assets amounted to Euro 33.5 bn giving an tiny increase in non-financial government worth (Euro 2.7 bn or 0.1% of GDP). This is to be seen against a reduction of the state's net financial wealth as expressed in terms of a far higher financing deficit (1,0% of GDP, according to the Maastricht-definition[1]). Some blame this on the concentration of public opinion upon the fiscal criteria of the Maastricht Treaty. Apparent consolidation successes of public authorities would eventually vanish or even revert to the opposite if a more expanded net worth perspective would be taken on (Easterly 1999). The deficit rule of the European Stability and Growth Pact, demanding a budget close to balance or in surplus, is attacked for not distinguishing between public consumption expenditure ("bad" deficit) and public capital formation that yields economic benefits in the future ("good" deficit).

Budget rules that incorporate the whole range of government assets and liabilities rather than a seemingly arbitrary subset of them would be an alternative. They all refer in one or another way to the "golden rule" of government financing which can be, very broadly spoken, expressed as the demand that as a consequence of state activity no less of society's resources are passed to the future than the amount inherited from the past.

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* Deutsche Bundesbank. The views expressed are my own and not necessarily those of the Deutsche Bundesbank.

1 Excluding UMTS proceeds.

This implies essentially a notion of intergenerational fairness. The "golden rule" is indeed a very old topic but has regained interest recently, at least partly because of the decision of the British government to choose - as one of its objectives for fiscal policy - to borrow only to invest but not to fund current expenditure over the economic cycle (HM Treasury 1997)[2]. Jurisdictions "down under" went even further: The government of New Zealand has to secure a position of positive net worth, to be able to cope with economic shocks. The legislature of the Australian state of New South Wales bound the government to maintain the value of government net worth in real terms.

In this regard, one could point to the fact that investment-related budget rules have so far played a disappointing role in securing sustainability of public finances. Take the rule in Germany's budget legislation, limiting the amount of net borrowing to the sum of gross investment expenditures, as an example. It has been unable to prevent neither an enormous built-up of government debt nor an absolute decrease in government net assets (Deutsche Bundesbank 1999). This should come as no surprise since the German legislation suffers from a couple of constructional flaws[3], and since the existing cash accounting system for Government does not allow to implement effectively concepts of government net worth. Conceivably, it would be precipitate to dismiss the golden rule as budgetary institution from past experience alone. New developments in government accounting and fiscal reporting could change the starting point of discussion. In fact, more and more governments world-wide are implementing accrual accounting and net worth concepts[4] following the pioneering New Zealand example where a government net worth concept is from the beginning of the nineties an integral element of the budget process (Pallot 1994).

In view of the swelling stream of new information in government finance net worth based fiscal rules may become easier to implement than

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2 See Robinson (1998), Buiter (1998), Balassone and Franco (2000b).

3 The inclusion of investment grants in investment expenditure, the exclusion of any depreciation items, the inclusion of loans given but not of loans repaid, the exception clause in the event of a disturbance of the overall economic equilibrium, only to mention a few.

4 Accrual accounting means booking the value of resource use when it occurs and not when cash is paid out or received. Accrual accounting is the natural basis for coherent public sector balance sheets. In fact, it is possible (and practised) to set up balance sheets from an array of secondary sources. They are far less reliable, however, and only of a very limited use in monitoring fiscal policy.

in the past. However, there is an apparent discrepancy between the growing popularity of such rules and the lack of theoretical underpinning in the existing literature. This paper wants to contribute to the discussion by taking the explicit perspective of agency-cost economics, sometimes also labelled the new institutional economics or transaction cost economics. The „State" represented by political decision-makers is viewed there as an agent who has to perform certain tasks on behalf of its principal(s) (citizen, voter, taxpayer). In fact, a sequence or chain of principal-agent relationships exists: voter to representative, parliament to government, cabinet to bureaucracy, bureaucratic superior to bureaucratic subordinate, and so on. Since agents are modelled as selfish actors, interest conflicts arise which can only be solved up to a limited extent due to asymmetric information and the impossibility of writing complete contracts. This implies efficiency losses as well as distributional consequences. From the normative side, agency-cost theory, used so far especially in industrial economics, but also in monetary policy, opens the opportunity to analyse the efficiency of alternative political institutions in minimising those transaction or agency costs[5]. Addressed to problems of sustainability of public finances the agency-cost approach differs from the sustainability analysis in the framework of the intertemporal budget constraint[6]. These latter exercises often have a flavour of "fiscal engineering" and seem to belong to the world of benevolent dictatorship. The formal fulfilment of the intertemporal budget constraint can imply highly inefficient fiscal paths[7]. In contrast, in our approach the question of sustainable public finances focuses on the proper functioning of political accountability mechanisms.

To evaluate government net worth concepts from an agency-cost perspective I want to take up the term *remediability*, introduced by Williamson (1993). It takes a different view on economic efficiency than that used in traditional welfare economics: a solution to an economic problem is said to be more efficient to an existing one if and only if it is feasible under current institutional conditions and can be implemented at reasonable costs. One should not judge the inefficiency of an actual alternative by comparing it to a hypothetical ideal. To curb the non-benevolence of political decision makers it may often be sensible to recur

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5 See Williamson (2000) for an overview and definitory issues.

6 See Balassone and Franco (2000a) for a summary.

7 See Velasco (2000) for a formal treatment.

to simple rules having modest information requirements only instead of using highbrowed instruments delivering efficiency gains only in a world without agency costs.

An example from the field of public budgets showing the failure of a seemingly superior institutional alternative if the criterion of remediability is not taken into consideration can be found in the fiscal history of the United States throughout the Reagan administrations. One of the more important reasons for the breathtaking discrepancy between multiple-period budget plans envisaging persistently declining fiscal deficits and the appearing reality of record deficits is attributed to the concept of budget baselines, a special feature of the American budget process. Its basic idea was to enable a better assessment of the fiscal impact of new policy proposal by projecting what it would cost in the future to continue government as it exists today (Muris 1994: 42). Announced budget plans are not shown against past period figures but against the baseline only. To calculate the baseline the developments of prices and costs have to be estimated not only giving room for unintended forecasting errors but also for strategic manipulations, for example by assuming high inflation rates and boosting expected tax revenue, as it was depicted so vividly by Reagan's budget director Stockman (1986)[8].

In the following sections, I will try to check for the remediability criterion regarding the use of government net worth concepts. It should be intuitively clear that information about the net worth position of the state and its development in time is valuable. In an environment where, contrary to private businesses, the simple yardstick of money profits is lacking transparency is the key item in order to hold decision-making agents accountable. Especially in the field of public management, the shift from

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[8] A further example comes from tax theory: A switch from direct to indirect taxes may be backed by efficiency considerations. The picture changes, however, if fiscal illusion on the side of voters/ taxpayers is taken into account: direct or income taxes are more visible than indirect or commodity taxes. The greater the share of less visible taxes in tax revenue, the greater is the danger that taxpayers do not take full account of the price they pay for publicly-provided goods and services, and the higher is the desired level of government expenditure, in consequence. Examples from other fields are Dixit (1996) who discusses why it could be rational for workers of a non-competitive, import-protected industry to continue offering votes in exchange for state aid (in the form of tariffs and production subsidies) even when a pareto-superior bargain would be possible where they were compensated for potential job losses by transfer payments. Boyer and Laffont (1998) analyse the optimal design of instruments in environmental regulation. Sophisticated incentive mechanism suggested by environmental economics may be inferior if political agency costs are taken into account.

cash to accrual accounting paves the ground for making visible the effective resource use of public activity and to calculate what government output really costs. This holds probably even after accounting for implementation costs.

The question is more complicated, however, if it comes to the institutional design of binding budget rules, verifiable numeric objectives for fiscal policy or performance indicators based on such information sets. I start with the question whether borrowing should be allowed to fund public capital. Focussing on the agency costs of giving government politicians more freedom in budgeting decisions, I make strong reservations against the golden rule and in favour of the balanced budget rule. The subsequent section extends the discussion about the golden rule and looks at the whole of government balance sheets. I will argue that focussing exclusively on the value of government net worth is a poor remedy to cope with principal agent problems. Some concluding policy comments close the paper.

2. Classical Golden Rule: the State may borrow to fund investment

Suppose that a national or a sub-national budget process is currently regulated by a balanced budget requirement. The citizenry or their representatives in parliament now have to decide if henceforth the golden rule of government financing should be applied. The existing institution demands that current revenues have to cover current expenditure as well as capital expenditure. The reform proposal would allow borrowing to finance public capital formation. Problems of enforceability for both alternatives are assumed away. Those who fear that under a balanced budget rule some valuable investment projects cannot be funded, in particular as a result of the struggle of interest groups about current consumption and transfer expenditures, will eventually vote in favour of the golden rule. Others, who concentrate on the danger of political misuse if the room for fiscal manoeuvre for the government is expanded by such a regime, may instead propose to stick to the balanced budget rule. Hence, the respective amounts of agency costs from underinvestment on the one hand and from overinvestment on the other hand are crucial in this decision problem.

2.1 The debate about overinvestment versus underinvestment

Anecdotal evidence provides support for both underinvestment and overinvestment. In one respect, congested and worn down highways indicate serious deficiencies in infrastructure capital maintenance. On the other hand, public investment projects often seem to have their starting place essentially in status-thinking or clientele-orientation of politicians rather than to enhance productivity of private sector capital. Furthermore, extensive public ownership of land, forests and enterprises yielding profits below market rates is a sign of overinvestment. It should be emphasised that not to desinvest, if a changing political and economic environment would call for a partial retreat of state sector activity, would also fall under the agency costs of overinvestment.

Closer empirical investigation on the effects of budgetary institutions on government capital formation is rather scarce, especially if compared to the large body of literature on public deficits, debt levels and government size. Investigating differences in public capital across American states, Crain and Oakley (1995) find that institutions such as term limits, citizen initiative, and budgeting procedures as well as political conditions such as legislative stability and voter volatility were significant determinants of state public capital stocks and new capital investments during the 1980s. Cadot et al. (1999) test a 'pork-barrel politics' hypothesis of investment decisions for regional governments in France. Besides a relationship between the number of large firms in a region as an indicator of lobbying strength and the infrastructure investment allocation they find that public capital formation is higher if the regional government is formed by the same political party as the central government. Kemmerling and Stephan (2000) show in a panel study that investment grants from *Länder* governments to German cities – a crucial determinant of local public investment spending – are correlated with the correspondence of the ruling political majorities. Widely known is the study of Poterba (1995) where he analyses the effects of financing rules for capital projects on the levels of public investment in US states. The result is that states with separate capital budgets, especially those that are allowed to borrow for public capital investment, undertake more investment projects than other states. Furthermore, there is no evidence that capital budgeting influences the level of government consumption spending. These results could indicate either that budget rules of the golden rule family lead to politically induced overinvestment or that such

rules alleviate the effects of politically induced underinvestment if capital spending has to be financed from current tax revenue only.

Theoretical contributions that derive a political bias toward underinvestment in public capital formation include for example Peletier, Dur and Swank (1999). Building on the work of Tabellini and Alesina (1990) who initiated the theory of the strategic use of debt, in their model, the option of deficit financing produces a deficit bias but no bias concerning the structure of government expenditure. Measured in opportunity costs it is always cheaper to finance consumption by way of new debt than by reducing investment expenditure since the latter yields a future reward that relaxes the government budget constraint. If borrowing is forbidden, uncertainty about future political majorities causes a suboptimal investment level. The higher the probability that the governing party (the median voter) tomorrow will be different from that of today, the lower will be the amount spent on investment since the proceeds of that investment will then be disbursed for public consumption goods that are only elements of the utility function of the new majority. Following a related line of reasoning, Leblanc, Snyder and Tripathi (2000) show that when investment and spending decisions are made by majority-rule, even fully informed, non-myopic citizens will typically choose an inefficiently small level of public investment. Both models suffer from an implausible dichotomy between public consumption and investment goods, however. The utility of public consumption is regarded as being specific to certain voter groups while the returns to public capital are, quite unrealistically, modelled in units of a means of payment and can be transformed into any future consumption good without any transaction costs. And even if the (non-monetary) proceeds of public capital formation are valued equally by all groups of voters, there is far less reason for the strategic use of the share of investment in the public budget[9].

2.2 A simple principle-agent model

To explain underinvestment as agency-costs of a balanced budget rule one would have to resort to additional arguments like voter myopia ("we would care about public capital if we would know how useful it

[9] See also Glazer (1989) for an argumentation why government policy may be biased to build „durable" projects.

is...") or intergenerational egoism ("let us loot public wealth since we do not care about our offspring's well-being..."). Myopia is a popular but analytically difficult category. Age specific distributional conflicts have been studied extensively in the literature[10]. Less attention have so far received the agency-costs of overinvestment under a golden rule. Here, I will concentrate on the costs that arise if egoistic political decision-makers are given the freedom to borrow any amount charging the public purse if only investment expenditure of equal value is recorded in the budget.

Consider the following simple principal-agent problem: Starting point is a budgetary equilibrium under the restriction of a balanced budget rule. Due to constrained tax revenue, perhaps resulting from a Laffer-curve effect, some public investment projects are not realised, that is the inefficiency situation of underinvestment has to be identified. The government as an agent of the citizenry may now fund those additional investment projects by borrowing money. The principal, once she has approved of this new mode of financing, cannot control the agent concerning the level and the structure of deficit-financed investment expenditure. It is assumed that a public investment project exists yielding returns of $R + \varepsilon$ where ε is a normally distributed random variable with mean zero and variance σ^2. The return variable is assumed to have a positive value and is a discounted value and net of borrowing costs as well as net of the operating costs of running the project.

The level of investment as a multiple of that investment project is denoted by Q. It would probably be more realistic to presume decreasing rates of return. Yet, the main results are not changed if, for example, a linearly descending schedule of the marginal efficiencies of capital is assumed. How the profitability of public sector capital can be measured is a widely discussed question. It reaps typically no direct monetary profits but has its effect through the promotion of private sector productivity leading in the end to higher tax revenue. This issue will not be developed here.

As usual, the principal-agent problem is defined by the utility function of the principal, the participation constraint of the agent, and the incentive constraint of the agent (equations (1) to (3)).

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[10] See Rangel (2000) for instance.

$$(1) \qquad \mathrm{E}(U_P) = (1-\beta)RQ - \tfrac{1}{2} r_P (1-\beta)^2 \sigma^2 Q^2 - \alpha - BQ$$

$$(2) \qquad \mathrm{E}(U_A) = \alpha + \beta RQ - \tfrac{1}{2} r_A \beta^2 \sigma^2 Q^2 + BQ \geq \bar{u}_A$$

$$(3) \qquad \mathrm{Q} \in \arg\max \left[\alpha + \beta RQ - \tfrac{1}{2} r_A \beta^2 \sigma^2 Q^2 + BQ \right]$$

Equation (1) is the expected utility of the principal. Both principal and agent are assumed to be risk averse. Standard models, especially in industrial and financial economics, usually regard the principal as risk neutral. This simplifying device is justified by pointing out that a single shareholder can reasonably be presumed to hold only a infinitesimal small proportion of his wealth in any one firm, and should be fully diversified in the total of his portfolio. Contrary to shareholders, voters or citizens should be modelled as risk averse principals since it is not possible to diversify a nationality. The linear formulation in (1) of mean and variance has been obtained by assuming constant absolute risk aversion[11]. It is further assumed that the principal's parameter r_P is not greater than r_A, the risk aversion parameter of the agent.

In deciding about the level of investment, the agent tries to maximise its own utility as shown in equation (3). Following the well known arguments of bureaucracy theory, I assume that the level of investment expenditure he commands provide the agent with a proportional utility BQ, $B < R$. The introduction of B as the driving force of overinvestment can be motivated by the experience that politicians decide upon investment projects with a small or even no economic value to society. Pronounced examples are the so-called white elephants in developing countries (Pritchett 1999). But also in mature democracies investment decisions are often made with regard to personal prestige (pyramid-building) or re-election prospects. Perhaps the most extreme form of bureaucratic maximisation can be found in socialist economies. The so-called investment hunger is a stylised fact of socialist systems. The socialist planners' objective to maximise capital per capita but not consumption per capita was an inevitable consequence of the incentives to

[11] As in the utility function $U = 1 - \exp(-rx)$ with r as parameter of risk aversion. If the wealth variable x is Normally distributed a monotonic transformation of expected utility as implicitly carried out here is feasible.

the bureaucracy (Zou 1991). One should note, however, that top level managers in private firms have comparable incentives to overinvest[12].

The only way for the principal to influence the agent's decision is a compensation schedule here for simplicity taken as linear scheme consisting of two parts, a sharing parameter β ($1 \geq \beta > 0$) which divides the return of investment between principal and agent, and a constant term α which merely redistributes wealth. The parameter β can be interpreted as a monetary reward as well as an indicator of the probability of re-election. Thereby it is not necessary to model explicitly the threat of electoral defeat by a challenging party or a contending politician. Simply the mere existence of willing office-seekers „...gives the voter whatever leverage he has on the incumbent" (Ferejohn 1986). An additional adverse selection problem would arise if there were different types of candidates for running the government with different but a priori not observable qualifications or "social motivations" in the sense of considering the interests of the principals besides personal motives. In the following, this possibility is neglected, and candidates with identical abilities are assumed.

Equation (2) defines the minimum compensation in terms of certainty equivalent that must be given to the agent in order to induce him to accept the contract. If the principal could control the agent's action, he would maximise (1) with regard to (2). The optimal investment level would be

$$Q^* = \frac{R(r_P + r_A)}{\sigma^2 r_A r_P} \tag{4}$$

The optimal incentive scheme implies optimal risk sharing between the two parties[13]:

$$\beta^* = \frac{r_P}{r_A + r_P} \tag{5}$$

[12] This is the phenomenon of the so-called empire builders (Aggarwal and Samwick 1999). Anecdotal evidence suggests that the wave of mergers and acquisitions in recent years often is not augmenting but wiping out shareholder value.

[13] The second-order condition for the agent is satisfied for all admissible values of β.

However, the agent was assumed to be free to choose the level of investment after the principal has announced the ruling incentive scheme. Using (3) leads to

$$\hat{Q} = \frac{\beta R + B}{r_A \beta^2 \sigma^2} \tag{6}$$

With (6) it is easy to see that overinvestment in proportion to the intensity of bureaucratic capture occurs at β^*, compared to (4). The principal can only try to reduce overinvestment by adjusting β given the agents choice regarding $\hat{Q}$. If it is assumed that the market for politicians features perfect competition, the agent can be kept at his reservation utility via adjusting the transfer parameter α. Thus, after substituting α in (1) such that the equality sign in (2) holds, the principal's optimisation problem is:

$$\underset{\beta}{\text{Max}}\, \mathrm{E}(U_P) = RQ - \frac{Q^2\sigma^2}{2}(r_P(1-\beta)^2 + r_A\beta^2) - \bar{u}_A \tag{7}$$

Inserting (6) into (7) produces

$$\underset{\beta}{\text{Max}}\, \mathrm{E}(U_P) = \frac{(\beta R + B)R}{r_A\beta^2\sigma^2} - \frac{(\beta R + B)^2}{2(r_A\beta^2)^2\sigma^2}(r_P(1-\beta)^2 + r_A\beta^2) - \bar{u}_A \tag{8}$$

The necessary condition for an optimal solution $\hat{\beta}$ is

$$\frac{\partial \mathrm{E}(U_P)}{\partial \beta} = [(r_A)^2\sigma^2\beta^5]^{-1}[-\beta^3 R(r_A + r_P)(R-B) - \beta^2(2r_A RB \tag{9}$$

$$- B^2(r_A + r_P) + 4RBr_P - r_P R^2) + 3\beta r_P B(R-B) + 2r_P B^2] = 0$$

There is (at least) one solution for $\hat{\beta}$ in (7) for $\beta \in]0,1[$ since it can be shown that $\partial \mathrm{E}(U_P)/\partial\beta < 0$ for $\beta = 1$, $\partial \mathrm{E}(U_P)/\partial\beta \to +\infty$ if $\beta \to +0$, and since the function $\partial \mathrm{E}(U_P)/\partial\beta$ is continuous in the relevant range. It follows directly that the second order condition holds also, as $\partial^2 \mathrm{E}(U_P)/\partial\hat{\beta}^2 < 0$.

Variation of parameters near the optimal sharing rule $\hat{\beta}$ is obtained by differentiating the implicit function given by (9). Not surprisingly, we have a negative influence of a higher r_A and a positive influence of greater value of r_P on $\hat{\beta}$. The effects arising from variations of either *B* or *R* are more difficult to trace analytically. However, for reasonable parameter domains the intuitive results apply that a higher degree of bureaucratic capture must be compensated by stronger performance incentives, and that a higher expected profitability may allow to reduce the strength of incentives. In any case, β^*, the solution of optimal risk sharing at the absence of bureaucratic capture, is the lower bound for $\hat{\beta}$.

2.3 Discussion

We have the result that it is possible to minimise additional agency costs in case politicians are allowed to invest on credit. However, we are interested in the choice between budget rules. The principal should opt for the balanced budget rule if the golden rule arrangement would imply losses or no additional benefits. If, on the other hand, an incentive scheme would be available that keeps the agency-costs of overinvestment below the benefits of additional investment projects he should choose the golden rule.

Figure 1 shows welfare as a function of the incentive parameter β at reasonable parameter values[14]. The reservation utility $\overline{u}_A$ is set to zero. The upper curve shows the principal's welfare if he can force the agent to his reservation utility; the lower curve shows the principal's welfare if the agent successfully captures an amount of rent at $\alpha = 0$. The division of total welfare hinges on the value of the parameter α in the payment schedule. If the participation constraint is binding, the upper curve is the relevant one. If there is no competition on the market for government politicians, for example if politics is a "closed shop" and the ruling elite represents a distinct class of persons, political agents cannot be forced to their reservation utility.

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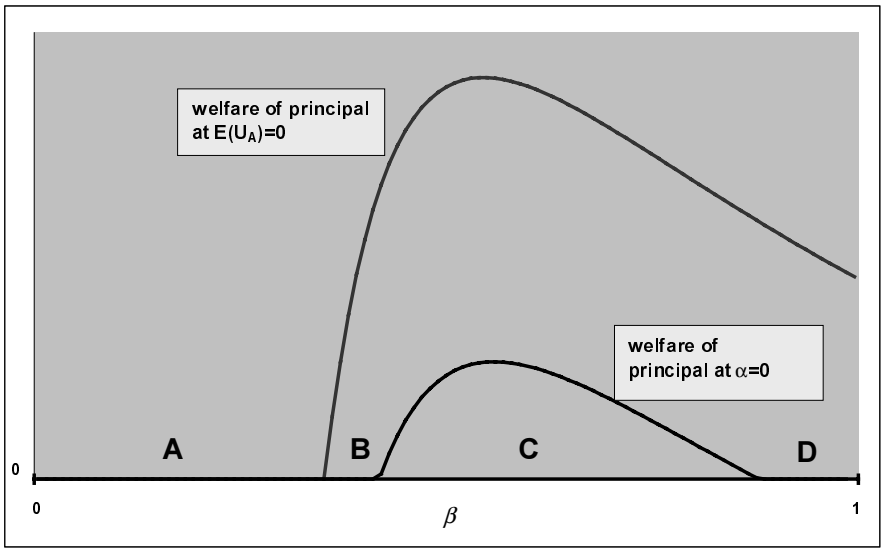
[14] $r_A = r_P = 1$; $R = 0.04$; $B = 0.004$; $\sigma = 0.05$.

Figure 1

Welfare and incentives



Using the graph, one can distinguish four different situations. In interval A the golden rule is unambiguously rejected (welfare is set to zero accordingly). In intervals B and D, no clear decision is possible. In interval C (possibly empty, depending on parameter values), welfare is positive, even after deducting all agency costs. In any way, high values of β are necessary to make the golden rule arrangement a valuable bargain for the principal. In the following, I want to discuss if the peculiarities of the principal-agent relationship studied seem to support the potential for such an incentive scheme.

a. Low powered incentives

This is the most obvious reason why the remediability criterion may fail. In contrast to managers of private firms it is generally not possible to have high-powered incentives regarding to the success of investment projects for government officials/politicians. In the public sector, we find constant salaries with no performance based pay elements. There are exceptions to the rule. The Canadian province of Manitoba laid down in its

"Balanced Budget, Debt Repayment and Taxpayer Protection Act"[15] that cabinet ministers have to accept cuts in salaries of 20 to 40 percent if in any past budget year a deficit not backed by explicit legal arrangements occurs[16]. In the course of public management reforms there has been among others a tendency of linking reward with performance. In New Zealand, cabinet ministers are not the administrative heads of their ministries or departments. Instead, they are one party in a fixed term contract with a "chief executive" who commits to deliver certain outputs having far-reaching freedom of choice how they organise, staff and run the department. Salaries of chief executives are not uniform, sometimes even higher than that of the Prime Minister, and contain an element up to 15% of their total remuneration package conditional on performance[17]. However, these isolated examples of incentive schemes merely permit a variability in remuneration far smaller than that available to make compatible the interests of shareholders and managers, for instance in the form of stock option plans. Hence, it may not be possible to implement the incentive schemes derived from theoretic arguments.

b. Different time horizons

The proceeds of public investment often accrue during an extended time period covering sometimes several decades. The planning horizon of politicians should be much shorter, sometimes only one election period. This leads to higher discount factors for agents as compared to the principal. Thus there are additional limits in sharing the benefits of investment. We would have to introduce a parameter of effective incentives β^e being strictly lower than β. As a consequence, the curves in figure 1 shift to the right thus aggravating (at least in some cases) the problem of low-powered incentives discussed above.

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15 See the text of the law at http://www.gov.mb.ca/chc/statpub/free/legdbindexena-f.html.

16 The Canadian provinces Northwest-Territory and Yukon-Territory have chosen even stronger sanctions in the form of a possible removal of cabinet members and dissolution of Parliament (Millar 1997). See for instance the Statutes of the Yukon, 1996, Taxpayer Protection Act, Article 6 (1): *If the non-consolidated public accounts laid before the Legislative Assembly show that an accumulated deficit has been created or increased, as compared to the immediately preceding non-consolidated public accounts, the Government Leader must (a) request before February 1 of the following year that the Assembly be dissolved, and (b) if dissolution is granted, forthwith recommend that writs for a general election be issued.*

17 See Gregory (2000); State Services Commission (1998).

c. Non-credibility of incentives

The principal's promise to give something worth of βRQ to the agent is not credible since the principal could renege the contract. The assumption that voters can commit themselves to a payment scheme has mainly been made in order to give the election mechanism the best chance to motivate political leaders to invest in long-term, efficient projects. However, from a strictly democratic point of view, voters are unable to commit future citizens to adhere to a particular voting behaviour. The contracting problem is rooted in the uncertainty about future electoral interests and the liberal principle of democracies to allow for free and anonymous voting behaviour in elections[18].

d. Ex post verification of rates of return

This can be seen as an argument concerning the principal agent relationship between government on the one hand and bureaucracy or contracting firms on the other hand[19]. Investment projects regularly take some years until completion with yearly revised expenditure allocations. The initial decision on the project is made on the basis of a cost benefit analysis. After the first stage of the project is completed, the projected cost schedule has to be revised upwards. Such cost overruns are frequent in the public domain and can either be attributed to unforeseeable cost developments or to the firms deliberate deception as regards cost data in order to get the project started. A variant of the cost overrun argument is the case of unexpectedly high maintenance costs, for example in the form of staff and energy costs to run a public facility. The government then has the choice of abandoning the project altogether or to back it by appropriating new funds. Clearly, stopping the project comes with the political cost of admitting to have made the wrong decision. Dur (2001) models theses costs in looking at the repealing of a policy as a (bad) signal to voters about the policy maker's competence if they do not have full knowledge of his abilities and competence influences the variance of the return of investment. Under a golden rule, only the characteristic of being an investment expenditure, regardless of the rate of return, is the criterion

[18] Gersbach (2000) studies mechanisms comprising combinations of incentive contracts and elections which can, under certain assumptions, mitigate this problem.

[19] Inspired by Tirole (1994: 20).

to approve expenditure. Hence, downward revision of returns or unexpected cost increases can be absorbed in a formally accurate way simply by borrowing more funds. Contrary to this, with a balanced budget rule new costs arise in reducing other expenditure items or increasing taxes. Only if opportunity costs are low enough, is the investment project continued[20]. Since the firm realising the investment project knows this in advance, it has less incentives to hide the true costs of the investment. The balanced budget rule is in comparison to the golden rule a (more) credible commitment for the government not to continue projects with significant cost overruns eradicating their profitability.

e. Multiple principals (common agency)

The principal agent relationship between citizens and government is in reality not that simple as outlined above but characterised by common agency: the agent is not confronted to a single, homogeneous principal but to several interest groups with very different, and often irreconcilable ideas about what government should do. This problem was formalised by Dixit (1996, 1997), Dixit, Grossman and Helpman (1997) and others. To see its relevance here, suppose that there are M different principals or groups of voters with distinct valuations of the N different types of public investment projects[21]. Any principal offers the agent a separate contract with individual sharing rules for each type of investment. It will concentrate high rewards to projects favoured and low or even negative values to projects disliked. The decision of principals regarding their payment schemes can thus be detrimental to each other, and the strength of combined incentives the agent is confronted with is weakened.

To simplify, I assume for the moment that N equals M and that each principal is only interested in one type of investment where he offers an incentive scheme to the agent whereas he does not care about other incentive schemes. On the other side, all kinds of investment project are financed together by government debt, and subsequent payments of interest and principal are laid on all principals in equal shares. A standard common pool problem arises: in terms of our simple model above this

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[20] I abstract from the costs of compensation claims if firms can refer to long run contracts.

[21] Alternatively, it would be possible to think of the same investment categories but with different financial burdens on the distinct interest groups, perhaps due to progressive income taxation.

would lead to the effect that the individual net return on investment (parameter R) rises with the number of principals. Consequently, the utility maximizing value of the parameter β decreases. If all principal behave in such a way – and it is individually rational to do so –, the equilibrium amount of total investment is inefficiently high. The externalities between principals due to the financing mode could be internalised by collusion. Principals could act as one virtual principal, agree a single reward scheme with the agent, and share the proceeds and costs of investments on a later stage. Transaction costs and commitment problems make this not a realistic option, however, especially if returns on investment are not transferable, thus demanding an additional system of side payments. Common agency thus aggravates the problem of overinvestment already present in the case of a single principal. Furthermore, it can be imagined that the bargaining power concerning the redistribution of rents (parameter α) shifts to the disadvantage of principals the more heterogeneous the constituency is.

Intergenerational conflicts can be regarded as another facet of the multiple-principal nature of government. In particular, the question of intergenerational equity has become a more and more important issue in the discussion on budget rules and fiscal sustainability. The point will not be addressed further here since the theoretical problems connected with it seem to deserve a special treatment. The difficulties start with the different meanings of the term "generation" which can be understood either as the people alive at one point in time or as the people of the same birth year[22]. Although it is often stated that passing undiminished government net worth from period to period is a matter of intergenerational fairness[23], no convincing definition of what equity between the generations should represent has been delivered so far. Their analytical treatment is further complicated by the fact that they are muddled up with several intragenerational conflicts (between those with and without descendants, for example).

To sum up: Balanced budget requirements are often criticised by economists for being too inflexible regarding the influence of the business cycle on budgets, and for not distinguishing between consumption expenditure and public investment. However, the golden rule as an

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22 Robinson (1997) has demonstrated how both concepts can be reconciled.

23 See for instance HM Treasury (1998).

alternative budgetary institution does not satisfy the criterion of remediability if the agency-costs of overinvestment resulting from bureaucratic capture are taken into account. The main reason for this lies in the difficulty to establish high-powered incentive schemes in the public sector. It should be stressed that a balanced budget rule in itself does not prevent distortions due to bureaucratic self-interest or political distribution conflicts. But it puts a ceiling on these agency costs. Related costs of underinvestment seem to be of no great importance if they are based, as done in the literature, on an artificial separation of distributional conflicts about public consumption expenditure items on the one hand and capital expenditure projects on the other hand. And even if they do exist, they may be acceptable because the costs of giving political agents the necessary autonomy in budgeting are much higher.

If the argumentation holds, the decline of public capital spending during periods of fiscal stress observed in statistics has to be addressed in a different way than demanding reform of overall budgetary rules. One reason could simply be the fact that the overwhelming part of public spending is predetermined by "maintaining the status quo", that is running existing facilities, executing current legislation and serving social benefit entitlements. Also, the ongoing tendency to outsource public services to private suppliers may be an important factor. Especially in the United Kingdom (Pollitt 2000), more and more infrastructure investments are financed, built and run by private enterprises[24]. A one-time public capital expenditure is thus transformed into a stream of service purchases from those private suppliers. Regarding the services available to citizens, no change to the worse would have occurred as may be concluded from existing statistics.

3. The balance sheet perspective: maintain government net worth

So far we looked at fiscal restrictions for financing new investment projects. This is the perspective of most existing golden rule based budget institutions. The actual performance of past investments was not taken into

[24] According to the Treasury, estimated capital spending by the private sector-signed deals in the framework of the so-called Private Finance Initiative now is at a magnitude of more than 10 percent of total public sector gross investment.
(http://www.hm-treasury.gov.uk/budget2000/fsbr/chapc.htm)

account. With government balance sheets based on fully integrated accrual accounts it becomes possible to consider this as well as all other changes in all kinds of assets and liabilities, for short, to focus on government net worth.

In fact, a change in net worth can be caused by a positive value of operating balance, by capital gains and losses, by changes in the reporting entity as well as by changes in accounting policy. The balance sheets of the Government of New Zealand record from fiscal year 1992 to fiscal year 2000 an impressive increase in net worth from a negative value of NZ$ 7.9 bn to a positive value of NZ$ 8.6 bn. Having a closer look at financial statements reveals that just under fifty percent of that increase was attributable to surpluses from operations. More than a third of the change resulted from periodic revaluation of the physical capital stock, and the rest was caused by profits and revaluation of state-owned enterprises on the one hand and foreign exchange gains on the other hand.

The classical golden rule concept would now reformulate to the principle of maintaining government net worth as a minimum requirement, that is government has to make sure that increases in public debt or other liabilities do not exceed the building up of public assets. A few jurisdictions have already implemented some kind of such rules in their budget laws or as documented fiscal targets[25]. Others may follow suit.

One aspect of studying the significance of the net worth concept in fiscal rulemaking would be to define more precisely the term “maintaining net worth”. For example, it could be asked whether adjustments for inflation should be made to balance sheet items before interpreting a change in net worth. The same applies to the problem if absolute values or ratios, for example with GDP as denominator, should be the basis for interpretation. I will not address this aspects here. Instead I will concentrate on the structure and the length of government balance sheets and argue that they convey import information regarding agency-costs[26].

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[25] “The principles of responsible fiscal management are ...(c) achieving and maintaining levels of Crown net worth that provide a buffer against factors that may impact adversely on the Crown's net worth in the future.” (New Zealand, Fiscal Responsibility Act, section 4 (2), 1994).
“The Government will at least maintain and seek to increase Total State Net Worth.” (Queensland Charter of Social and Fiscal Responsibility, 1999).

[26] Thereby I will omit the discussion of a secular trend which will become more apparent in the future, namely the dissolution of responsibility from production of public services. This trend is vaguely circumscribed by the popular term outsourcing and leads, in the last consequence, to the

(continues)

Just "drawing the line", that is using a single net worth figure to evaluate fiscal performance is not recommendable. First of all, however, it is necessary to discuss the proper definition of net worth.

3.1 Comprehensive net worth and reported net worth

The major net worth approaches used are *reported net worth* (*RNW*) and *comprehensive net worth* (*CNW*) (Bradbury, Brumby and Skilling 1999). The latter is the sum of discounted cash flows of all government receipts and expenditures from now to infinity (Buiter 1983). The correspondence to the intertemporal budget constraint is obvious. *RNW* is the difference of the values of assets and liabilities shown on a balance sheet. It represents at one point in time the bookkeeping value of past transactions. Generally it is not possible to bring both concepts together, for example by taking the backward-looking *RNW* as an opening balance. While some items included in *RNW* can be calculated on a discounted cash-flow basis consistent with *CNW* (for example the actuarial value of future pension payments for government employees which have to be regarded as elements of service pay), others like most fixed assets will be linked to historic cost accounting[27].

The advantage of the concept of *RNW* is that it is relatively easy to compile, once decisions about valuation rules have been taken. Its usefulness as a basis for decision-making is limited from a purely economic point of view, though. No rational investor would value stocks on the sole information about a firms past profits. On the other side, *CNW* is informative regarding fiscal sustainability but difficult to apply taking into account the uncertainties about the future paths of revenues and expenditures, and the problem of the appropriate choice of discount factors δ_i. For the latter, the rates at which government borrows could be used. Future developments of revenues and expenditures can be estimated with a

phenomenon of "government without administration". It is avoiding some existing but creating at the same time new kinds of agency costs. Balance sheet analysis becomes far more complicated if total classes of assets start to vanish from the books.

[27] Some financial obligations resulting from past actions do not even appear on the balance sheet as they cannot be quantified. This is for example true for the financial impact of government loan guarantees.

variety of more or less sophisticated methods[28]. The reason why *CNW* is nevertheless not appropriate in an agency-cost frame work is an inevitable commitment problem. It is easy to see that for any given value of *CNW* any promise regarding cash flows in the current election period can be fulfilled by shifting the necessary budgetary adjustments to the future. But since future governments can not be bound by today's decisions (and must not in a democracy), the corresponding value (or change in value) of *CNW* is never a credible commitment.

In the political sphere, not a present value but a period by period view is relevant, and only the change of *RNW* in a limited period of time is feasible in the sense that it can serve as a basis for contracts between the principal and political agents. From a *CNW*-perspective it is for instance obvious to define "total debt " as the sum of "explicit debt", issued bonds and direct borrowings as parts of *RNW*, and "implicit debt", the present value of unfunded claims on future government budgets. Following such a reasoning and using the graph presented in Raffelhüschen and Jägers (1999: 8), Italy would be less heavily indebted (in relation to GDP) than Germany, Spain or the UK! This is somewhat surprising since Italy has so far not been known as a fiscal model country. The Italian pension reform of 1995 could be the major reason why the ratio of implicit debt to GDP for Italy is shown to be near zero. This reform takes several years to come into full effect[29] showing – without any intention to ignore the merits of pension reform in general – how easy *CNW* related figures could be influenced by the political process. Fiscal sustainability analyses of that kind have doubtless their analytical value in the discussions of economic policy. If it comes to the grips with political contract-making, however, the lesson is "to take budgets as budgets" (Wildavsky 1993).

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[28] For example, estimations of future tax receipts can start from the simple assumption of constant revenues and take the form of actual tax revenues divided by the rate of average borrowing costs as a measure for the present value of taxing authority (Huther 1998). As an alternative, more refined options pricing models could be applied (Draaisma and Gordon 1996).

[29] Franco and Sartor (1999: 120): "As a new law, the reform to date has produced only a limited portion of its long-term effects. The relative slowness in reaching full maturity is due to the very benign transition granted to current workers".

3.2 The asset side of the government balance sheet

In the public sector accounting literature the overall definition of assets will always be something like: "… resources controlled by an entity as a result of past events and from which future economic benefits or service potential are expected to flow to the entity" (IFAC 2000). In the accounting practice, once assets are identified they are valued according to appropriate rules where for each category a pragmatic compromise between relevance and reliability is found in the sense that if future economic benefits are difficult to quantify a possible fall back procedure would be to take easily accessible data, for example cost values. The final outcome of this exercise is a single figure, the total money value of assets. Starting from the approach taken in this paper, however, it is the structure of assets that determines the amount of agency-costs involved. The most important distinction in this regard is to separate cash-flow generating assets from those that do not produce cash flows. Recall the definition from Jensen (1986): A firms free cash-flow consists of those idle funds that remain after all projects with a positive capital value have been financed. The task of designing the contractual relationship between owners and management is to prevent the latter from disbursing the funds for unnecessary administrative outlays or loss-bearing investment projects. Applied to the public sector, cash-flow generating assets are all assets which have a market value and which are not in use for producing core government services. To be classified in this category, it is not necessary that cash actually flows, say from state-owned firms to the government budget, as it is the potential for free cash-flows that matters. It can be used already at the firm level when the politicians derive political benefits from excess employment because those employees are supposed to use their vote in favour of their benefactors[30].

One could object to the argument above that government budgets do record interest and dividend revenues, enabling to exercise control – in their quality to cover the total of expenditures – (as good or as bad) as for any other kind of revenue. Yet in fact, governments will always find a way to understate proceeds from capital invested. If revenues above budget accrue, there should be no difficulty in finding pressing expenditure needs to satisfy instead of disbursing them to taxpayers. If, on the other hand, actual revenue falls short of plans, demand for further funding is

[30] See the model in Shleifer and Vishny (1998, chapter 9).

expressed. To overcome this incentive problem, it would be possible to introduce a capital charge on the value of all cash-flow generating assets. The capital charge would serve as a minimum profitability requirement and would reduce the operating surplus (like depreciation allowances). However, new problems as how to set down the rate of the charge and how to adjust for risk components would arise. In any case, it would be superior to redeem debt in order to save agency costs.

At the practical level, it is not an easy task to identify exactly (non)cash-flow generating assets. The categories of financial and non-financial wealth seem to be a likely approximation. However, it is imprecise since a lot of non-financial assets like landed property and buildings could without difficulty be integrated into state-owned enterprises. In addition, there are often public sector services inside the budget which are in principle of a commercial nature. Their capital stock could also be part of a state-owned enterprise. An apparent solution to this demarcation problem would be to differentiate between "realisable capital" and "administrative capital" ("realisierbares Vermögen" and "Verwaltungsvermögen", Hinzmann (1993)). The problem is that one has to define what is the "core" of government services before allocating capital goods to these two types of assets. This is necessarily a moving target.

One sub-category of financial assets are governmental loans given to the private sector, including agencies and corporations controlled by the government, or other governments[31]. The treatment of these loans as financial wealth identical to equity shares and the like is not without problems. Since governments are no banks they do not intend to make money by handing out funds. On the contrary, they lose money because they lend money at interest rates below market prices due to political objectives like development aid, subsidisation of branches suffering from high costs of structural adjustment and other areas were failures in the private loan market exist, actual or alleged. Sometimes additional concessions regarding payments of principal are granted during the life of the loan contract. Increasing the amount of governmental loans leaves net worth in conventional balance sheet terms constant while it effectively

[31] Its share in total assets is sometimes large: In the Japanese Government balance sheet (see Aida, Kazuo et al. 2000) loans amount to 40% of the total of assets.

decreases net worth[32]. One option to take this into account would be to book the difference between the market rate and the required rate as current expenses in an accrual fashion. Nevertheless, it would be very difficult to calculate the appropriate risk premium.

In comparing the fiscal performance of two governments keeping the value of net worth constant, the one having less cash-flow generating assets on its balance sheets imposes less agency-costs on its citizen-principal. Divesting and privatising in the sense of complete withdrawal from corporate ownership should be welfare-enhancing even if investment are purportedly held for reasons of portfolio diversification only. The definition of Maastricht debt as a gross figure loses its arbitrariness to some extent since it contains additional information not carried by net debt/ net financial wealth figures.

The second category of government assets poses far more difficult problems, namely what should be included as assets, and how should they be valued? The general criteria of generating future economic benefits or service potential to the public applies to far more categories of government spending than those usually recorded as investment outlays. Public education (human capital formation) and the judiciary system (deterrence) are nearby examples. The main problems to include such items are the exact demarcation of current and future benefits as well as the calculation of depreciation values[33]. In this regard, it is also a question of crucial importance who is in charge of valuing and if he is subject to transparency and auditing regulations.

A large amount of public infrastructure assets, the most important subcategory, are complementary to private capital goods. Therefore, it would be highly misleading to offset them with equally valued financial/cash-flow generating assets "below the line". The valuation concepts applied in practice for infrastructure assets all start from some form of historic cost accounting. The purchasing price or the construction cost of an asset is adapted in time by applying some kind of depreciation schedule, and, a strongly disputed topic, by adjustments for price inflation. Only by chance are figures compiled by those methods equal to the

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[32] The argument extends to securities issued by government controlled entities which are part of the corporate sector.

[33] Including losses caused by citizens who move to another jurisdiction and take their publicly acquired human capital with them.

economic value of public assets. Generally, they can be assumed to be biased upwards since governments should not be supposed to be cost minimising. Hence, to thwart government claims for new debt seemingly backed by asset totals that are difficult to interpret (and to control) one should consider to establish a stern cautiousness principle that places acquisition cost as the maximum value and recognises revaluation downwards but not upwards[34]. Furthermore, a summation of values for individual objects is problematic regarding the complementary and network characteristics of public infrastructure. What the citizen-voter essentially is contracting for with government is maintaining a certain level of service capacity that depends, through time, on changing demographics, changing preferences, and other factors. Existing capacities can be either sufficient, or too low or too high, thus making book values of infrastructure assets (and the corresponding value of government net worth) potentially misleading. If a too low capacity of road infrastructure burdens the economy with high congestion costs[35], targeting the performance of net worth may become rather useless.

A third category of public sector assets are the so-called cultural or heritage assets. They embody intrinsic values to society because of their significance as national/regional symbols. Examples are historic monuments, arts collections, and some natural sites. A not negligible part of this category has a market value (think of the Brandenburger Tor in Berlin sold to some rich – and eccentric – person who pulls it down and re-erects it in his private park). From an agency-cost perspective, however, such assets should be recorded on the balance sheet with symbolic values (1,-) or off balance sheet in a presentation of "stewardship information[36]". This would prevent that free cash-flow is generated by selling off such assets or is (mis-)directed by purchasing new assets, for example paintings.

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34 The widely used method of depreciated replacement cost does not fall under this principle.

35 See Sumpf (1997) for an estimation of the annual social costs of road blocks in Germany. The results are in the 100 billion Euro range.

36 See Office of Management and Budget (2000) for such an approach.

3.3 The liability side of the government balance sheet

Given the asset side of the government balance sheet, should there be concern about the structure of the liability side? Disregarding agency costs and intergenerational conflict, one could answer "no" by pointing out to the Barro-Ricardo equivalence theorem since the division between net worth and the total value of liabilities[37] just influences the intertemporal profile of tax payments. That does matter, of course, if taxes are not lump-sum[38]. Distortionary taxes should be imposed in such a way as to minimise the dead-weight loss of taxation. Constant tax rates over time are optimal under the assumption of increasing marginal excess burden of the tax rate. In the case of uncertainties about the future (economic growth, level of public spending) tax-smoothing policy calls under some circumstances for precautionary taxation (Bohn 1995), that is more net worth and less liabilities.

A counterintuitive argument suggests having *more* debt. One of the incentive mechanisms discussed by Jensen (1986) was to substitute own stocks by bonds since a greater part of free cash-flow is absorbed by interest payments. Such an idea seems irrelevant for the public sector with no titles to property. However, the analogy with corporate finance holds for the following thought experiment: Citizen-taxpayers receive a one-time tax rebate financed completely by a new bond issue. That reduces immediately government net worth by the same amount. Taxpayers balance sheets are left neutral in present value terms while bearing the welfare costs of fluctuating tax rates. If government is operating near the peak of the tax Laffer curve, a certain share of the increased interest payments must eventually be financed by decreasing other expenditure items. If this means at the same time less room for bureaucratic capture, a decrease in the costs of government agency is possible. Less budgetary flexibility is equivalent to less opportunities for misusing public funds. The two countervailing cost effects have to be balanced in order to find the optimal debt level. To promote higher indebtedness (or not reducing

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[37] Defined as: „…present obligations of the entity arising from past events, the settlement of which is expected to result in an outflow from the entity of resources embodying economic benefits or service potential."

[38] According to an intuitively appealing argument of Bohn (1992) they would not be consistent with a democratic society because lump-sum taxes would imply the right of the state to take away any sum at any time from anyone. This would mean dictatorship. The principle of equality demands to link taxation with some criteria abstracting from individual taxpayers, such as income, wealth or consumption.

already high debt levels) at the cost of net worth seems a strange recommendation. However, this is at the heart of the debates on the use of budget surpluses, the political struggle for the "fiscal dividend", taking place for example in the U.S. Should public debt be reduced, thus making it easier for future governments to fund additional expenditure, or should buoyant tax revenues channelled back immediately to the citizens via single cash transfers? Indebtedness is always an intertemporal resource transfers toward the present. With Leviathan-like governments it could be a means to safeguard citizens future resources. This is only valid, of course, if intergenerational conflicts are disregarded.

Concerning the structure of liabilities, differing agency-costs can play a role if the different probabilities of default for certain kinds of debt are taken into account. While defaults of funded liabilities like government bonds and loans are normally not a policy instrument in most (civilised) countries and jurisdictions, the case is not that clear-cut for unfunded liabilities. The quantitatively most important category of unfunded liabilities are pension entitlements of public sector employees. Since they are part of the pay for services rendered they have to be recorded in an accrual accounting framework. Though the value of entitlements is determined by law, any commitment to the long-term development of pension levels is not fully credible. Therefore, agency-costs are reduced if entitlements are securitised in the form of payments in individual savings accounts or tradable securities. In this regard, it may be interesting to note that the government of the Australian state of New South Wales made an offer to public sector employees the conversion of accrued pension benefits to portable lump sums to be paid into a (state-run) funded pension scheme. To finance the conversion offer, the government borrowed significant sums, thus increasing net debt but leaving unchanged the state's total liabilities by reducing net unfunded superannuation liabilities by an equal amount.

4. Summary and conclusions

Reforms of government accounting and financial reporting are spreading rapidly around the world. This paper is devoted to the fact that discussions about the implications for fiscal analysis and control do not keep pace with these developments. Accrual accounting and the compilation of business-like financial reports forces governments to

publish additional information that enhances transparency and thus reduces agency-costs. The degree of transparency and the potential for "creative accounting", that is the misrepresentation of the true fiscal variables, are closely related (Milesi-Ferretti 2000). It is true that a danger of eclecticism in valuation methods (Robinson 1996) and corresponding manipulation exists but this is in itself no compelling argument against setting up government balance sheets. If, like in Germany, only fragmental pieces of information exist about what governments actually possess and owe, such exercises should be welcomed. They also would allow to address an agency problem regarding publicly owned assets that was pointed out by Tanzi and Prakash (2000). In a cash-budgeting environment assets de facto carry zero values after acquisition. Since governments often own land and buildings located in sometimes very expensive downtown areas used as schools, offices etc., enormous capital gains would show up after a accurate recording of these assets on the balance sheet. But politicians are not interested to unveil the opportunity costs of their current use. Instead, their hidden values are likely to be captured as a source of free cash flows.

However, in the field of binding fiscal rules, it is questionable whether sophisticated rules based on balance sheets can be found which comply with the criterion of remediability. Concerning the question if government should be allowed to borrow for investment in public sector capital, it was shown that this variant of the "golden rule" of government financing implies important agency-cost of overinvestment whereas the costs of underinvestment, accentuated in the literature, seem no convincing argument against a balanced budget rule that encompasses the whole of government spending. Extending the "golden rule" to the totals of government assets and liabilities, the main message is that balance sheets showing the same values of government net worth have conceivably to be assessed very differently in terms of agency costs. The availability of additional structural information is critical for interpreting net worth figures correctly. And even the basic idea of keeping net worth at least constant looses firm ground if it is taken into account that contradictory arguments about the "right" level of net worth exist. The concept of government net worth in itself remains ambiguous since no clear-cut rule as to the valuation and summation of tangible fixed assets is available. There can be no solution to this problem until it is not precisely defined what the basic and uncontested functions of the State are - whereas the typical enterprise holds no such "core".

Do these remediability considerations imply that the status quo regarding the fiscal restrictions of the Maastricht Treaty and the Stability and Growth Pact should be accepted? If the "close to balance or in surplus"-clause could be successfully established as a kind of balanced budget requirement (with fairly small adaptations for business cycle effects) this would be a means to keep governments from pursuing irresponsible fiscal policies. On the other hand, it should be reminded that, from an agency-cost perspective, there are also severe shortcomings of these European rules, in particular regarding transparency and accountability. They are defined in national accounts categories, in view of the diversity of government accounting systems across member states an acceptable fall back procedure. But since national accountants have to rely on government accounts and only can make – on a broad and highly aggregated level – adjustments and reclassifications given that database (Lüder 2000) harmonisation remains incomplete, and its factual extent is unknown. The transparency virtues of accrual accounting cannot become effective to their full intensity because the primary source of national statistical offices still is cash based accounting. National accounts methodology was set up for other reasons than to control governments' use of taxpayers funds as can be seen most visibly in the way the government sector is delineated. Whether an institutional unit belongs to the government or to the private sector is determined in ESA 1995 by reference to fuzzy criteria like producing primarily for the market, keeping separate accounts and charging economically significant prices for its outputs. The essential features of ownership and control of the entity, however, are not a decisive factor. Since, in consequence, a large and manipulable part of government activity is outside the official fiscal indicators the power of incentive or control devices building on them is weakened considerably. Further agency-costs arise due to making Eurostat, a government agency belonging to the European Commission services, the key player for interpretation of the Maastricht deficit definition. Some events in the past indicate that political influence cannot be ruled out here.

Fully harmonised methods of fiscal reporting developed and surveyed by independent bodies would enhance the power of control for citizen-principals vis-à-vis their government agents since the fiscal performance of other jurisdictions then can be used, under the threat of the exit option, to evaluate their own politicians records'. The working of this control device is hampered if, even in one country, diverse solutions to related problems are chosen: Reform models at the local level in Germany

so far take separate asset valuation approaches, and capital budgets are looked at very differently at the state and federal level in the United States (President's Commission to Study Capital Budgeting 1999, McNamee et al. 1999). Therefore, it is noteworthy that the Public Sector Committee of the International Federation of Accountants (IFAC) is presenting drafts of standards of accounting for the public sector[39]. Though they do not actually tie governments, they could serve as the nucleus for future official harmonisation efforts.

[39] See the respective documents at http://www.ifac.org.

REFERENCES

Aggarwal, R.K. and A.A. Samwick (1999), "Empire-Builders and Shirkers: Investment, Firm Performance, and Managerial Incentives", NBER Working Paper, No. 7335.

Aida, K. et al. (2000), *Provisional Concepts and Standards for the Japanese Government Balance Sheet*. http://www.mof.go.jp/english/index.htm

Balassone, F. and D. Franco (2000a), "Assessing Fiscal Sustainability: a review of methods with a view to EMU", in Banca d'Italia (ed.), *Fiscal Sustainability,* Roma.

_____ (2000b), "Public Investment, the Stability Pact and the 'Golden Rule'", *Fiscal Studies*, Vol. 21, No. 2, pp. 207-29.

Bohn, H. (1995), *Optimal Crown Debt*, CS First Boston and Treasury of New Zealand, Auckland.

Boyer, M. and J.-J. Laffont (1999), "Toward a Political Theory of the Emergence of Environmental Incentive Regulation", *RAND Journal of Economics*, Vol. 30, No. 1, pp. 137-57.

Bradbury, S., J. Brumby and D. Skilling (1999), "Sovereign Net Worth: An Analytical Framework", New Zealand Treasury Working Paper, No. 99/3.

Buiter, W.H. (1983), "Measurement of the Public Sector Deficit and Its Implications for Policy Evaluation and Design", IMF Staff Papers, Vol. 30, pp. 306-49.

_____ (1998), "Notes on a Code for Fiscal Stability", CEPR Discussion Paper, No. 1831.

Cadot, O., L.-H. Röller and A. Stephan (1999), "A Political Economy Model of Infrastructure Allocation: An Empirical Assessment", CEPR Discussion Paper, No. 2336.

Crain, M. and L. Oakley (1995), "The Politics of Infrastructure", *Journal of Law and Economics*, Vol. 38, No. 1, pp. 1-17.

Deutsche Bundesbank (1999), "Development of Public Sector Investment, and its Financing", *Monthly Report*, April.

Dixit, A. (1996), *The Making of Economic Policy: A Transaction-Cost Politics Perspective*, Cambridge, Mass.

_____ (1997), "Power of Incentives in Private versus Public Organizations", *American Economic Review, Papers and Proceedings*, Vol. 87, No. 2, pp. 378-82.

Dixit, A., G.M. Grossman and E. Helpman (1997), "Common Agency and Coordination: General Theory and Application to Government Policy Making", *Journal of Political Economy*, Vol. 105, No. 4, pp. 752-69.

Draaisma, T. and K. Gordon (1996), "Valuing the Right to Tax Income: An Options Pricing Approach", OECD, Economics Department, Working Paper, No. 160, Paris.

Dur, R.A.J. (2001), "Why do Policy Makers Stick to Inefficient Decisions", *Public Choice*, Vol. 107, Nos. 3-4, pp. 221-34.

Ferejohn, J. (1986), "Incumbent Performance and Electoral Control", *Public Choice*, Vol. 50, pp. 5-26.

Franco, D. and N. Sartor (1999), "Italy: high public debt and population ageing", in: *European Economy, Reports and Studies*, No. 6: *Generational accounting in Europe*, pp. 117-32.

Gersbach, H. (2000), "Competition of Politicians for Incentive Contracts and Elections", Working Paper, University of Heidelberg.

Glazer, A. (1989), "Politics and the Choice of Durability", *American Economic Review*, Vol. 79, No. 5, pp. 1207-13.

Gregory, B. (2000), "Getting Better But Feeling Worse? Public Sector Reform in New Zealand", mimeo. www.willamette.org/ipmn/research/papers/wellington/gregory.html

Hinzmann, C. (1993), *Neukonzeption staatlicher Rechnungslegung am Beispiel des Landes Nordrhein-Westfalen*, Speyer.

HM Treasury (1997), *The public sector balance sheet*, London.

_____ (1998), *Fiscal policy: current and capital spending*, London.

Huther, J. (1998), "An Application of Portfolio Thery to New Zealand's Public Sector", New Zealand Treasury Working Paper, No. 98/4, Wellington.

IFAC Public Sector Committee (2000), *International Public Sector Accounting Standard IPSAS 1: Presentation of Financial Statements*, New York.

International Monetary Fund (2000), *A Manual on Government Finance Statistics*, draft of the second edition, Washington.

Jensen, M.C. (1986), "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers", *American Economic Review, Papers and Proceedings*, Vol. 76, No. 2, pp. 323-9.

Kemmerling, A. and A. Stephan (2000), "Political Economy of Infrastructure Investment Allocation: Evidence from a Panel of Large German Cities", Discussion Paper, No. FS IV 00-03, Wissenschaftszentrum Berlin für Sozialforschung.

Leblanc, W., J.M. Snyder and M. Tripathi (2000), "Majority-rule Bargaining and the Under Provision of Public Investment Goods", *Journal of Public Economics*, Vol. 75, No. 1, pp. 21–47.

Lüder, K. (2000), "National Accounting, Governmental Accounting and Cross-country Comparisons of Government Financial Condition", *Financial Accountability and Management*, Vol. 16, No. 2, pp. 117-28.

McNamee, P., D. Dornan, D. Bajadek, and E. Chait (1999), *Understanding GASB 34's Infrastructure Reporting Requirements*, PricewaterhouseCoopers.

Milesi-Ferretti, G.M. (2000), "Good, Bad or Ugly? On the Effects of Fiscal Rules with Creative Accounting", IMF Working Paper, No. 00/172.

Millar, J. (1997), "The Effects of Budget Rules on Fiscal Performance and Macroeconomic Stabilization", Working Paper, Bank of Canada.

Muris, T.J. (1994), "The Uses and Abuses of Budget Baselines", in J.F. Cogan, T.J. Muris and A. Schick (eds.), *The Budget Puzzle. Understanding Federal Spending*, Stanford, pp. 41-78.

New Zealand Treasury (2000), *Financial Statements of the Government of New Zealand For the Year Ended 30 June 2000*, Wellington.

Office of Management and Budget (2000), "Stewardship: Toward a Federal Balance Sheet", in *Budget of the United States Government - Fiscal Year 2001, Analytical Perspectives*, Washington.

Pallot, J. (1994), "Specifying and monitoring government performance in New Zealand: an evaluation of progress to date", in E. Buschor and K. Schedler (eds.), *Perspectives on performance measurement and public sector accounting*, Bern, Stuttgart und Wien, pp. 219-40.

Peletier, B.D., R.A.J. Dur and O.H. Swank (1999), "Voting on the Budget Deficit: Comment", *American Economic Review*, Vol. 89, No. 5, pp. 1377-81.

Piketty, T. (1999), "The information-aggregation approach to political institutions", *European Economic Review*, Vol. 43, No. 4-6, pp. 791-800.

Pollitt, M.G. (2000), "The Declining Role of the State in Infrastructure Investment in the UK", Working Paper, No. 0001, Department of Applied Economics, University of Cambridge.

Poterba, J.M. (1995), "Capital Budgets, Borrowing Rules, and State Capital Spending", *Journal of Public Economics*, Vol. 56, No. 2, pp. 165-87.

President's Commission to Study Capital Budgeting (1999), *Final Report*, Washington.

Pritchett, L. (1999), "The Tyranny of Concepts: CUDIE (Cumulated, Depreciated, Investment Effort) is *Not* Capital", World Bank Policy Research Working Paper, No. 2341.

Raffelhüschen, B. and T. Jägers (1999), "Generational accounting in Europe: an overview", *European Economy, Reports and Studies*, No. 6: Generational accounting in Europe, pp. 1-16.

Rangel, A. (2000), "Forward and Backward Intergenerational Goods: A Theory of Intergenerational Exchange", NBER Working Paper, No. 7518.

Robinson, M. (1996), "Public Sector Net Worth: Is it Worth Measuring?", Commonwealth of Australia, Parliamentary Library Research Paper, No. 36.

Robinson, M. (1997), "Intergenerational Equity, Deficits and Generational Accounting", Working Paper, School of Economics and Finance, Queensland University of Technology.

_____ (1998), "Measuring Compliance with the Golden Rule", *Fiscal Studies*, Vol. 19, No. 4, pp. 447-62.

Shleifer, A. and R.W. Vishny (1998), *The Grabbing Hand. Government Pathologies and Their Cures*, Cambridge, Mass.

State Services Commission (1998), *Annual Report for the Year Ending 30 June 1998*, Wellington.

Stockman, D.A. (1984), *The Triumph of Politics*, Washington.

Sumpf, J. (1997), "Wohlfahrtseinbußen und Umweltbelastungen durch Verkehrsstau", in Deutsche Verkehrswissenschaftliche Gesellschaft (ed.), *Verkehr im Spannungsfeld von Ökologie, Wettbewerb und technischen Innovationen*, Bergisch Gladbach, pp. 14-43.

Tabellini, G. and A. Alesina (1990). "Voting on the Budget Deficit", *American Economic Review*, Vol. 80, No. 1, pp. 37–49.

Tanzi, V. and T. Prakash (2000), "The Cost of Government and the Misuse of Public Assets", IMF Working Paper, No. 00/180.

Tirole, J. (1994), "The Internal Organization of Government", *Oxford Economic Papers*, Vol. 46, No. 1, pp. 1-29.

Velasco, A. (2000), "Debts and Deficits With Fragmented Policymaking", *Journal of Public Economics*, Vol. 76, No. 1, pp. 105-25.

Western Australia Treasury (1999), *The Public Sector's Balance Sheet*, www.treasury.wa.gov.au.

Wildavsky, A. (1993), "Securing Budgetary Convergence within the European Union without Central Direction", in A. Wildavsky and E. Zapico-Goñi (eds.), *National Budgeting for Economic and Monetary Union,* Institute for Public Administration, Maastricht, pp. 143-71.

Williamson, O.E. (1993), "Transaction Cost Economics and Organization Theory", *Industrial and Corporate Change*, Vol. 2, No. 2, pp. 107-56.

_____ (2000), "The New Institutional Economics: Taking Stock, Looking Ahead", *Journal of Economic Literature*, Vol. 38, No. 3, pp. 595-613.

Zou, H. (1991), "Socialist Economic Growth and Political Investment Cycles", *European Journal of Political Economy*, Vol. 7, pp. 141-57.

POSTWAR FISCAL RULES IN THE NETHERLANDS: WHAT CAN WE LEARN FOR EMU?

Ron J. Berndsen[*]

1. Introduction

In the post-war period there have been several striking developments in the Dutch fiscal stance (Figure 1). The fiscal balance was on average in deficit (2.4 % of gross domestic product, GDP), with a 'peak' in 1982 at 6.6% of GDP[1]. The public sector expanded rapidly in the following period reflected in a rising net public spending ratio (expenditure consolidated with non-tax funds). The principal reason for this lay in the fact that a large part of the expenditure was based on open-ended arrangements. Since an open-ended arrangement by definition means there is no link between the size of the available budget and the possible claims on that budget, such expenditure is difficult to control. This was proved very true in practice. The most striking example is in the field of social security, where transfer payments to households showed a sharp rise from around 7% of GDP in 1955 to approximately 26% of GDP in 1980. Taxation and social security contribution revenues also began to grow strongly from 1955 onwards, although the level of revenues remained less than the level of expenditure.

All in all the budget balance showed a small deficit throughout the 1960s and early 70s. The debt ratio fell, partly owing to the strong economic growth but partly also as a consequence of inflation. In the years following 1975 the fiscal balance deteriorated sharply, which was also reflected in a sharply rising debt-to-GDP-ratio.

The major fiscal consolidation process in the Netherlands started after 1983 and can arguably be considered as completed in 1999 with the

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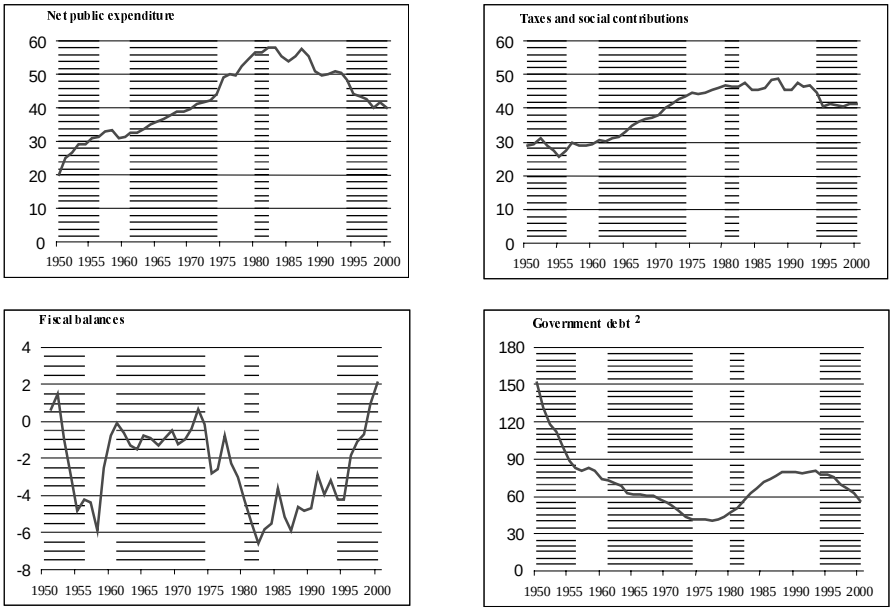
[*] De Nederlandsche Bank. The views expressed in this paper are those of the author and are not neccessarily those of De Nederlandsche Bank.

[1] Unless otherwise mentioned, fiscal balance refers to net lending of general government as defined in ESA79 before 1995 and ESA95 thereafter. The budget balance measure used by the government in the period up to and including 1994 was the financial deficit of central government i.e. net lending including financial transactions, without social security and lower government levels. The denominator was net national income (NNI) rather than GDP. Measured in those terms the peak occurred in 1983 at 10% of NNI.

Fig. 1

Key Fiscal Data 1950-2000
(percent of GDP)



Source: Netherlands Statistics and CPB.

1. Shaded/non shaded areas denote period in which a particular fiscal rule was in operation (see Table 1).
2. Prior to 1975: net debt; after 1975: gross debt; after 1988 in percent of harmonized GDP.

occurrence of a fiscal surplus. Despite the very strong expansion of the public sector and persistent deficits, budgetary control procedures have been in operation in the Netherlands throughout the postwar period[2]. This raises the question of what role fiscal rules had to play in controlling the growth of the public sector in the Netherlands. The second question addressed in this paper relates to the establishment of EMU. With the provisions of the Maastricht Treaty including the Stability and Growth Pact now in place, the question emerges what role national fiscal rules (with respect to the fiscal balance) still have to play in situations of surpluses.

[2] As early as 1814 a fiscal rule was in operation in the Netherlands. Until the Second World War these fiscal rules where variants on the principle of a balanced budget (Stevers, 1976).

2. Postwar Fiscal Rules in the Netherlands[3]

In the period since the Second World War, various fiscal rules have been in operation in the Netherlands. In Table 1 seven primary rules are identified (also shown in Figure 1). Most of them are rules with respect to some measure of the financial balance[4].

Table 1

Overview of Postwar Dutch Fiscal Rules

Period	Primary Rule	Target Variable	Quantitative goal
1945-1956	Capital Principle	$FB_{cap.exp}$	
1957-1960	Cyclical Deficit Rule	FB_{cycl}	
1961-1974	Structural Budget Rule	FB_{struct}	stood at -3% of NNI in 1974
1975-1979	1% Rule on Tax Burden	T	maximum increase of 1%-point p.a.
1980-1982	Actual Financial Deficit	FB_{actual}	target of -4 and -5% of NNI
1983-1994	Time Path Approach	FB_{actual}	1983/86 reduction with 1.5%-point p.a.
		FB_{actual}	1986/90 reduction with 1.0%-point p.a.
		FB_{actual}	1990/94 reduction with 0.5%-point p.a.
1994-2002	Real Net Expenditure Rule	G_n	1995/98 declining ceiling 0.7% p.a.
		G_n	1999/02 increasing ceiling 1.5% p.a.

Note: Start of period refers to first year of application. New fiscal rules for year t are generally introduced in Budget Memorandum t, published in September t-1. The standard term for government is four years.
Goal variables: FB = Financial Balance central government, T = Taxes, G_n = General Government expenditure (net, consolidated with non-tax revenue); NNI = Net National Income.

2.1 Constant Capital Principle

In the initial post-war years, the capital principle was the formal guide for the national budget. Under this classical norm current expenditure and revenue should balance each year. In contrast it was mandatory to borrow to finance capital expenditure so that public capital

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3 A part of this section is based on Wellink (1996).

4 Sometimes a secondary rule (a fiscal rule with a lower priority than the primary rule) on expenditure or revenue was introduced as well. These rules are not considered in this paper.

remained constant. However, in view of the deplorable state of government finances at the end of the war, the generally accepted priority was to put the house in order. The broad support for this made a tight fiscal policy possible, so that by the early fifties the government was running a surplus. Until the mid-fifties government finances were dominated by the necessary financial reconstruction after the war. This was due to the high rate of economic growth and the surpluses enjoyed by the central government as a result of recovery of unpaid taxes in respect of the war years.

2.2 Cyclical Deficit Rule

In the second half of the 1950s a strong relationship was established between the state of the economy and the size of the budget deficit. In 1957 an official switch was made to the cyclical deficit rule as the primary budgetary norm, partly in response to a deteriorating economy. According to this norm, based on a Keynesian model, the main purpose of the budget was to smooth the business cycle by means of an anticyclical policy. The experience with that rule was not favorable, partly because it was applied asymmetrically: when the economy was weak, demand was indeed stimulated but the brakes were not applied when the economy surged ahead. The difficulty of identifying the turning points in the business cycle in time also contributed to the lack of success of the cyclical norm. In the few years that this norm was the primary guide, the debt ratio rose slightly, contrasting sharply with the rapid decline in this ratio over the preceding decade.

2.3 Structural Budget Rule

In 1961 the cyclical norm was replaced by the structural budget rule[5]. In contrast to the cyclical deficit rule, the emphasis of this rule was in fact on cyclical neutrality. The idea behind the structural budget rule was to match the government deficit to the structural level of borrowing in the other sectors of the economy (the private sector and abroad). For the latter sector the desired level of the current account on the balance of payments was a surplus of 0.5 to 1.0% of NNI (in order to finance current spending on development aid from the capital account of the balance of payments). If the actual rate of economic growth was different from the trend rate of

[5] Also known as the Zijlstra rule. Zijlstra was then Minister of Finance.

growth, then under this policy rule the actual budget deficit was permitted to depart from the level deemed acceptable in the long term. The discrepancy between actual and structural deficit levels was not subject to a norm. However, to avoid misallocation among the sectors of the economy, a Structural Budget Margin was established within the constraints of the targeted structural deficit. This additional rule defined the maximum amount of money available for changes in expenditure and tax policy. The advantage of such a rule is that it strengthens the hand of the finance minister since colleagues in the spending departments have to come to an agreement within the permitted budget margin.

2.4 1% Tax Burden Rule

In the mid-seventies - without completely abandoning the structural budget rule - a new rule representing a relative restriction on the cost of the public sector, the so-called 1% rule, was introduced by the then Minister of Finance Duisenberg. This norm aimed at limiting the rise in the tax burden (relative to GDP) to one percentage point per annum. Although this rule seems very generous by today's standards, it nevertheless implied a major intervention in those days when one considers that, without this change of direction, an average annual increase in the cost of the public sector of two percentage points would have been included in the estimates.

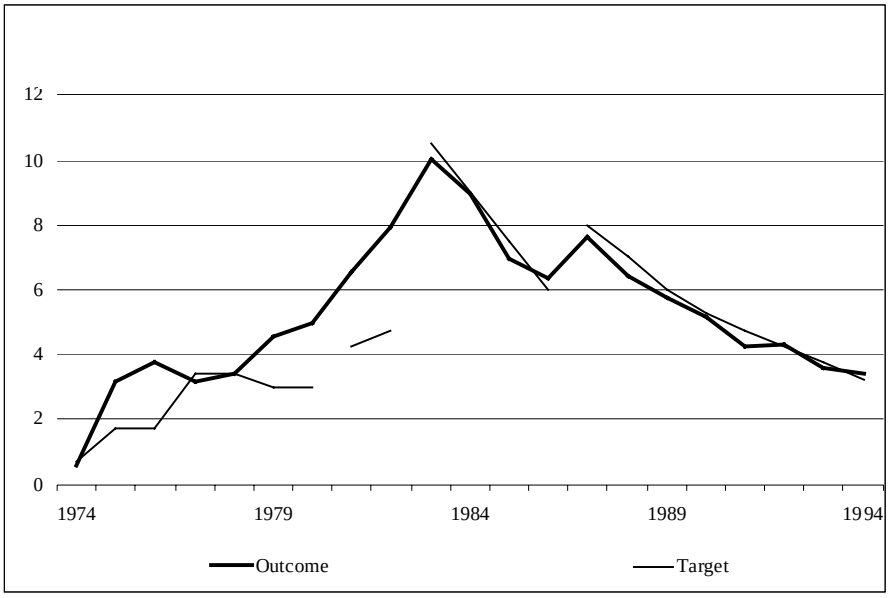
The Budget Memorandums in the early years of the structural budget rule made no attempt to put a figure on the acceptable level of the deficit in the long term (Sterks, 1982). Moreover, the calculation method was altered several times over the years (e.g. taking a different year as the basis). As a result, direct comparisons between the target and the outcome is only possible for a limited number of years. In the period 1974-1980 the structurally acceptable deficit underwent a significant overall upward adjustment, ultimately standing at 3% of NNI. Almost without exception the actual deficit in any one year was in excess of the target and the gap widened despite the relaxation of the norm. The weaknesses of the structural budget rule became clear after the first and second oil crises of the seventies. The Dutch current account showed an increasing surplus but was positively distorted by the country's gas revenues during that period. This led to overestimation of the scope for domestic spending and hence excessive fiscal deficits.

2.5 Actual financial deficit control

The sharp rise in the actual budget deficit, partly caused by the recession, led to the abandonment of the structural budget norm at the end of the seventies. From the outset, however, the aim was to return as quickly as possible to the structural budget policy[6]. But it was to be almost twenty years before the fiscal stance showed a surplus. The key issue then was to get the actual budget deficit down. Cutting the deficit was also necessary from the point of view of stabilization, however, in order to create the latitude within which the automatic stabilizers would be able to operate. In the years 1981 and 1982, ad hoc targets were set for the deficit (between 4% and 5% of NNI) but these were unable to prevent the fiscal situation from deteriorating fast (see Figure 2).

Fig. 2

Financial deficit central government
(percent of net national income)



[6] To quote the Budget Memorandum 1980 (p. 39): "as soon as the actual budget deficit has been reduced to more acceptable proportions".

Whereas the draft budget for 1982 (in September 1981) showed a budget deficit of 4.8% of NNI, just three months later the figure had been revised to 5.5%. Another three months on, 6.3% was being forecast and the Spring Budget of 1982 was based on a government deficit of 8% of NNI, despite the fact that the latter figure took account of additional spending cuts of NLG 3 billion (0.9% of NNI). The then finance minister spoke in his introduction to the 1983 Budget Memorandum of an 'almost explosive growth in the deficit'. In retrospect, that was the time in which the need for fiscal consolidation was greatest, in view of a record post-war deficit figure.

It was not until 1983 that multi-annual targets for reducing the deficit ratio were drawn up, the so-called time path approach. In the three governments in the period 1983-1994 (under Prime Minister Lubbers), a four-year (straight-line) time path for reducing the deficit was plotted. In each successive government the planned reduction in the budget deficit was smaller, however: down from an annual reduction of 1.5 percentage points to half a percentage point a year. It may nevertheless be concluded that the three time paths were closely adhered to, with the exception of 1987, when the deficit jumped sharply and the time path for the reductions had to be shifted upwards by 2 percentage points (Figure 2). In the course of time, the time path approach did reveal certain weaknesses, however. To begin with, the budgeting process tended to become a very hectic affair. Owing to the tight margins imposed with respect to the annual targets, every setback meant a revised budget. As a consequence the budget horizon was quickly reduced to one year, so that short-term considerations gained the upper hand at the expense of an integral approach to spending and revenues. Secondly, the chance of coming in under target, due to windfalls on the revenue side especially was reduced. Towards the end of the eighties, therefore, budgetary discipline began to slip as tax windfalls were used to compensate overspending or to fund additional spending (Brouwer and Ter Haar, 1994). Thirdly, the budget deficit figure became increasingly 'contaminated' with incidental components and adjustment items, so that the rule was in fact eroded although on paper it was still being adhered to. In the final year of the time path approach (1994) the deficit contamination amounted to a number roughly equal to the target level of the budget deficit (2.2% of NNI), making the underlying deficit 4.3% of NNI. The result of this rule erosion process was that the necessary structural cutbacks were deferred.

2.6 Real Net Expenditure Rule

In August 1994 when a new cabinet took office a new fiscal rule, the real net expenditure rule was introduced[7]. Under this rule total real net public expenditure (i.e. public expenditure including social security outlays, consolidated with non-tax funds) was bound to a ceiling. During the first government term of Prime Minister Kok the ceiling (which can be interpreted as the maximum allowed) declined with an average annual rate of 0.7% (Budget Memorandum 1995) while in his second cabinet the constraint was relaxed to an average increase of 1.5% per annum. Given the large increase in real net expenditure of approximately 2.5% per annum (actual outcomes) in the years 1990-1994, the target under the net expenditure rule can be considered as ambitious. In addition to the net expenditure rule, a secondary norm regarding tax revenues has been introduced in 1998. The experience with the net expenditure rule has been favorable so far as the steep upward trend in expenditure in the early 90s has been broken in 1994 and that the targets have been met. The latter success is partly the result of applying cautious assumptions, which resulted in an *a priori* higher chance of windfall gains. For details on the assumptions and further aspects of this rule, see Heeringa and Lindh (2001).

3. The Life Cycle of Dutch Fiscal Rules

On average, the time span of a fiscal rule in the Netherlands (based on the categories distinguished in Table 1) is about seven years. To investigate the factors behind this limited time span we study two not mutually exclusive candidates. First, the general economic condition, which is proxied by average output growth. In times of recession or low trend growth more often than not a fiscal rule becomes really binding, implying tough policy measures. Depending on the commitment of the government to that particular rule it is sometimes easier to implement a new, less binding rule. Second, the political environment i.e. changes in central government. This is tackled by considering whether the announcement of a new fiscal rule coincides with the formation of a new cabinet since at those points in time a new fiscal rule can easily be

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[7] This rule is also known as the Zalm-rule, according to the custom that a rule bears the name of the finance minister (Zalm) who introduces it. Real is used here in the sense that nominal government expenditure is deflated with the GDP-deflator (and not the deflator of government expenditure).

introduced signaling a fundamental change in government policy. Between 1945 and 2000 22 cabinets have been formed in the Netherlands[8]. Apart from these two factors there is a third complicating factor, an administrative phenomenon that could be described as 'rule erosion': the tendency that over time adaptations and exceptions are made with respect to the rule effectively undermining the constraint put forward by the rule.[9] These alterations to the rule can be put forward by both the cabinet and parliament. Rule erosion can also be seen as an easy alternative to a completely new rule. Usually however the rule becomes less transparent which implies a cost[10]. The effect of rule erosion is however that it is often difficult to pinpoint where one fiscal rule is *de facto* replaced by another fiscal rule. Hence the seven periods shown in Table 1 and 2 are to some extent open to different interpretations. An example already mentioned above is the calculation of the structural budget and the budget margin in the period 1961-1974. Over the years the method and the base year were altered leading to an increase of the 'acceptable' deficit. Another example is the inclusion and exclusion of certain items in the definition of the financial balance of the central government during the time path approach. At the start (1983) only one item existed (off budget expenditure items, introduced in 1974, were included in the deficit figure). At the end (1994) there were 8 items ranging from the acceleration of tax collection, the sale of public assets and various loans (to housing corporations and students). The quantitative importance of the items varied but could in some years well exceed 1% of NNI which is large compared to the annual decrease in the target under the time path approach.

The following picture emerges from Table 2, where data with regarding the first two factors is shown. First, the change in government plays a clear role in only two cases (indicated by the first year, 1983 and 1994), although these cases are the two most recent ones. A third case (1945) is less relevant as these changes follow mainly from the resumption of government after the war. Second, the general economic condition

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8 This is only one simple but unambiguous way of measuring changes in government. See De Haan and Sturm (1997) for alternatives e.g. the number of parties in a coalition, whether or not a minority government, or the political orientation of a coalition (left or right wing).

9 See e.g. Stevers (1993). There is a parallel with Goodhart's Law (Wellink 1996).

10 To quote Oort and De Man, (1968): "...the problem of fiscal rules is in essence a question of political rules and a commitment to play by the rules. A game which inevitably involves so many players must have simple, transparent and acceptable rules; it must not be allowed to become a tournament open only to the grand masters who know all the moves and gambits." (translated from the Dutch).

Table 2

Two Factors influencing the Life Cycle of a Fiscal Rule

Period	Primary Fiscal Rule	New cabinet [1] (name)	Output growth in period [2]		
			Average	Minimum	Maximum
1945-1956	Capital Principle	yes (Schermerhorn-Drees)	5.3	1.7	8.4
1957-1960	Cyclical Deficit Rule	no (Drees III)	3.9	-1.0	9.0
1961-1974	Structural Budget Rule	no (De Quay)	4.9	2.8	8.6
1975-1979	1% Rule on Tax Burden	no (Den Uyl)	2.4	-0.1	5.1
1980-1982	Actual Financial Deficit	no (Van Agt I)	-0.3	-1.2	0.9
1983-1994	Time Path Approach	yes (Lubbers I)	2.6	0.8	4.7
1994-2002	Real Net Expenditure Rule	yes (Kok I)	3.6	2.3	4.5

[1] (new) Cabinet in first year of a new fiscal rule.
[2] Data refer to time period in first column.

seems to be a factor in explaining the abandonment of several fiscal rules in the 1970s and 1980s. After the first oil crisis it is clear (with the benefit of hindsight) that the 'golden' growth performance in the previous period (1961/74) of almost 5% with a slowest growth of 2.8%, came to an end. In the following period (1975/79) growth stagnated for the first time in more than a decade and the average annual growth rate fell to 2.5%. Another point in case is the period at the beginning of the 1980s when a major recession hit the Netherlands and fiscal balances deteriorated quickly, leading to the abandonment of the 1% rule on the tax burden in favor of actual deficit control. From these examples one may infer that the length of the life cycle of fiscal rules in the Netherlands is influenced by changes in government or adverse economic conditions (e.g. recessions).

4. What National Fiscal Rule in EMU?

With the start of the third stage of Economic and Monetary Union (EMU) on 1 January 1999 member states must avoid so-called excessive deficits. Under the Maastricht Treaty the lowest allowable fiscal balance is set at -3% of GDP, the relevant goal variable in this case is the actual fiscal balance. In addition, the budgetary provisions of the Stability and Growth Pact (Pact) act as a constraint for national fiscal policy. Under the Pact member states are to maintain a position close to balance or in surplus over

the medium term. This situation should be reached preferably in 2001 but in 2002 at the latest. The interpretation of the provision 'over the medium term' taken here is that the goal variable must be some measure of a cyclically adjusted budget balance which must then remain close to balance or in surplus), otherwise the provision 'over the medium' would be superfluous. In addition member states should also consider all other influences which might put the actual fiscal balance (too) close to the 3% limit, such as the effects of an ageing population or a high debt level. If these effects are taken into account almost all countries should indeed aim for a surplus (in cyclically adjusted terms), as argued in Brits and De Vor (2000).

Hence it is clear that the European fiscal rules limit the choice for designing national fiscal rules[11]. There are two possible responses to this European budgetary framework. Firstly, for countries with a federal government structure it may be advantageous to translate the commitment of the Pact to lower levels of government (national stability pacts). This option is less relevant for the Netherlands as lower levels of government (provinces and municipalities) have little discretion given the requirement of a balanced budget. Secondly, given the requirement of a cyclically adjusted budget close to balance or in surplus there is little need for a national rule limiting the fiscal balance in some additional way (assuming of course that the requirements of the Pact are fulfilled). One important function of the budget is however still open to national budgetary authorities, the macroeconomic stabilization function. Indeed, under EMU it becomes increasingly important to utilize all possible adjustment mechanisms in order to deal with asymmetric shocks. Hence national fiscal rules should contribute to a stable economic development as much as possible. It is however broadly understood that active fiscal policies to stabilize the economy ('fine tuning') are surrounded by several problems:

- The 'correct' economic model is unknown, which makes it difficult to predict future growth and inflation. The relevant forecast horizon for drawing up most budgets is one year. Recent calculations on the forecast error for GDP one year ahead (measured by the mean absolute error) for the Netherlands come out in the order of 1 per cent (CPB 1999). This corresponds to results for most other industrialized

[11] Rules with respect to some measure of the fiscal balance. Level rules (on expenditure or taxes) could still usefully be applied as European rules only restrict the difference between expenditure and taxes.

countries found elsewhere in the literature (Koutsogeorgopoulou 2000). Given this magnitude of the error it is clear that a forward looking fine-tuning rule is not likely to succeed in a dampening of the cycle in practice;

- There is the risk of a pro-cyclical fiscal policy as a result of slow parliamentary approval and implementation of measures;
- Another risk is that the active fiscal rule is applied asymmetrically, resulting in too little fiscal consolidation in economic upturns;
- Frequent changes in taxes and public spending may also cause supply side inefficiencies (Van den Noord 2000).

Hence, passive fiscal policy with respect to cyclical influences i.e. letting the automatic stabilizers work to the extent possible, seems to be a more obvious way to contribute to macroeconomic stability (given a sound fiscal stance)[12]. The above mentioned problems do not apply to automatic stabilizers. Another advantage is that the automatic stabilization rule is transparent: all cyclical influences on the fiscal balance are simply accommodated. It should be noted that the emphasis put above on the automatic fiscal stabilizers does not imply that fiscal policy should be the only or the main adjustment mechanism to country-specific shocks. There are of course several other adjustment mechanisms that may potentially supplement fiscal stabilizers, e.g. wage flexibility and labor mobility.

5. Concluding remarks

Dutch experience with budgetary control in the postwar period has been mixed. One thing which stands out is how typical of their periods fiscal rules are, as a result of which there have been frequent changes. During times when adhering to the rule poses difficult political decisions, more often than not there is a tendency for the rule to be eroded, and then to be replaced in due course by a new one. Given the new institutional environment created by EMU, the importance of a domestic rule with respect to some measure of budget balance is limited to its stabilization property. It is argued that automatic stabilizers have some advantages in this respect.

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[12] Recently there is a growing interest in the literature on automatic fiscal stabilizers (Van den Noord, 2000; Cohen and Follette, 2000).

REFERENCES

Alesina, A. and R. Perotti (1995), *The Political Economy of Budget Deficits*, IMF Staff Papers, 42, No. 1.

Brits, H.J. and M.P.H. de Vor (2000), "The Pact for Stability and Growth", in P.A.G. van Bergeijk, R.J. Berndsen and W.J. Jansen (eds.), *The Economics of the Euro Area, Macroeconomic Policy and Institutions*, Cheltenham, UK, Edward Elgar, pp. 195-214.

Brouwer, H.J. and B. ter Haar (1994), "Economic Policy Coordination and the Role of Fiscal Targets", in A.F.P. Bakker et al. (eds.), *Monetary Stability through International Cooperation,* (Essays in honour of André Szàsz), Dordrecht, Kluwer Academic Publishers.

Cohen, D. and G. Follette (2000), "The automatic fiscal stabilizers: quietly doing their thing", *Federal Reserve Bank of New York Economic Policy Review*, April.

de Haan, J. and J.E. Sturm (1997), "Political and economic determinants of OECD budget deficits and government expenditures: A reinvestigation", *European Journal of Political Economy*, 13, Elsevier Science Publishers, pp. 739-50.

von Hagen, J. (1992), *Budgeting Procedures and Fiscal Performance in the EC*, Economic Papers 96, Brussels, European Commission.

Heeringa, W.L. and Y. Lindh (2001), *Dutch versus Swedish budgetary rules: comparison and stabilizing properties,* draft (this workshop).

Koutsogeorgopoulou, V. (2000), *A Post-mortem on economic outlook projections,* OECD Economics Dept. Working Papers, No. 274.

Mussa, M. and P. Masson (1995), *Long-term Tendencies in Budget Deficits and Debt*, Symposium of the Federal Reserve Bank of Kansas, Jackson Hole, Wyoming.

van den Noord, P. (2000), *The size and role of automatic fiscal stabilizers in the 1990s and beyond*, OECD Economics Dept. Working Papers, No. 230.

Oort, C.J. and G. de Man (1968) (in Dutch), "De 'Zijlstra-norm' in Theorie en Praktijk", *Economisch Kwartaaloverzicht,* No. 12 and 13, Amsterdam-Rotterdam Bank NV.

Sterks, C.G.M. (1982), *Begrotingsnormen* (in Dutch), Ph.D. thesis, Rijksuniversiteit, Groningen.

Stevers, Th.A. (1976), "Begrotingsnormering" (in Dutch), in *Economisch en Sociaal-Historisch Jaarboek,* part 39, Martinus Nijhoff, The Hague, pp. 1814-939.

Stevers, Th.A. (1993), *De Begrotingsnorm van het Rijk* (in Dutch), Noord-Holland, Amsterdam.

Wellink, A.H.E.M. (1996), "Budgetary Control: Goodhart's Law in Government Finances?", in C. Kool et al. (eds.), *Essays on Money, Banking, and Regulation*, Dordrecht, Kluwer Academic Publishers, pp. 69-90.

COMMENTS ON SESSION II: EUROPEAN FISCAL RULES

Anne Brunila[*]

To ensure smooth functioning of EMU with a single monetary authority and multiple fiscal authorities, EU Member States opted for a fiscal policy framework that is essentially rule-based. The first step in introducing supranational fiscal rules were the Maastricht fiscal criteria for joining EMU and the Excessive Deficit Procedure (EDP) that restrain budget deficits to 3% of GDP and debt levels to 60% of GDP. The second step was the adoption of the Stability and Growth Pact (SGP) that complements and tightens the fiscal provisions set in the Maastricht Treaty.

The SGP sets the medium-term target for budgetary positions of close to balance or in surplus, steps up procedures for multilateral surveillance and specifies the type and scale of sanctions to be applied in the event of an excessive deficit. The basic motivation behind the strict deficit limit, 'close-to-balance' rule and sanctions for non-compliance was to make budgetary discipline watertight in EMU, while still allowing a certain degree of fiscal flexibility. At the minimum, the 'close-to-balance' rule requires that budgetary positions over the medium-term should be strong enough to let automatic stabilisers to operate fully without a risk to breach the 3% of GDP deficit limit during recessions. The SGP also allows a limited degree of state contingency by singling out exceptional circumstances such as severe recessions and natural disasters, under which the deficit limit can be temporarily exceeded without triggering an Excessive Deficit Procedure and possible sanctions.

A strict rule-based approach guaranteeing strong fiscal discipline in EMU was deemed necessary to prevent moral hazard and 'deficit bias' that could erode the credibility of the common monetary policy. Moreover, fiscal rules can be seen as a device to improve transparency and predictability of fiscal policy making at national and EU level.

The setting up of the Maastricht fiscal criteria and the SGP in a context of both historically high public debt and persistent budget deficits revitalised academic interest in rule-based fiscal policy. Recent analytical

[*] European Commission.

and empirical work on fiscal rules in the context of EMU has focused largely on the stringency of the SGP deficit limit. It has frequently been argued that it would prevent automatic stabilisers from properly working when they are most needed as countries are forced to discretionary fiscal tightening in recessions for not to breach the deficit limit and incur sanctions. The EMU framework of rule-based fiscal policy and independent central bank with rigorous price stability objective has also spurred academic interest in policy co-ordination and interactions between monetary and fiscal policies in a monetary union.

The papers in this session reflect well the recent interest in fiscal rules and policy co-ordination in EMU. All papers deal with numerical rules that set limits on fiscal variables. The paper by Ron Berndsen focuses on the functioning of nationally imposed fiscal rules in general and draws on the Dutch experience on a number of fiscal rules implemented over the past 50 years. Wolfgang Föttinger addresses incentive problems arising under a golden rule relative to a balanced budget rule, while Philippe Mills and Alain Quinet discuss problems related to the working of automatic stabilisers under medium-term close-to-balance rule. The paper by Marco Buti, Jan In't Veld and Werner Röger focus explicitly on the use of supranational fiscal rules in the context of a monetary union. They analyse fiscal and monetary policy co-ordination in a monetary union. In what follows I will discuss the issues raised in these papers from the point of view of the following questions: Does the SGP with its 'close-to-balance' rule make national fiscal rules redundant in EMU? Would the golden rule of deficit financing provide a feasible alternative to the 'close-to-balance' rule? Does the 'close-to-balance' rule hamper cyclical stabilisation? Does EMU need policy co-ordination beyond the SGP?

Does the SGP with its close-to-balance rule make national fiscal rules redundant in EMU?

What are desirable characteristics for national fiscal rules? For any rule to be successful in delivering desirable outcomes, it has to be credible. In practice, this requires operationally simple and transparent rules with efficient enforcement mechanisms and sanction systems. Moreover, monitoring of the compliance with the rules should be easy and carried out by an independent agent. These characteristics imply a trade-off between simplicity and transparency on the one hand, and flexibility and

contingency on the other: contingent rules can easily become less transparent and subject to manipulation.

The paper by Berndsen illustrates well the difficulty in defining fiscal rules that are operational (easy to calculate and monitor), transparent and efficient in delivering the desired outcome. The Dutch experience on various national budgetary rules (constant capital rule, cyclical deficit rule, structural budget rule, tax burden rule, actual financial deficit control, net expenditure rule) shows also clearly that when the government unilaterally declares a certain budgetary rule as an objective with no sanctions for non-compliance or enforcement mechanisms to prevent targets being reformulated or departed from, rules are likely to be abandoned or eroded over time. Berndsen finds basically two situations that are likely to result in the abandoning of national budgetary rules: worsening economic situation making harder to stick to the rules or a new government coming to power with new policy priorities. Problems in commitment can thus make nationally adopted rules rather short-lived and inefficient in preventing the existence of persistent deficits and high public debt.

For both types of commitment failures supranational fiscal rules, such as the SGP, can provide a clear remedy; internationally agreed rules with sanctions cannot be abandoned as easily as national rules. The SGP does not however necessarily imply that national fiscal rules in EMU are worthless. The medium-term 'close-to-balance' rule of the SGP concerns general government, not only the central or federal government. However, in most EU countries it is the central government that commits to the medium term budgetary targets on behalf of the whole general government without much involvement of regional and local governments in setting the targets. In countries where lower levels of government have substantial financial autonomy, national level budgetary rules can serve as a co-ordination device to improve accountability and commitment of other budgetary players to the set targets. To this end a number of Member States have introduced national level budgetary rules (stability pacts, medium-term expenditure ceilings) to supplement the SGP.

Besides the potential need to strengthen budgetary co-ordination at the national level, national budgetary rules that constrain fiscal policy along appropriate lines can be used to diminish the risk of pro-cyclical relaxation of fiscal policy in good times. The SGP is essentially focused on budgetary discipline during cyclical downturns and hence, may not provide enough incentives to be prudent and to run even sizeable budget surpluses during periods of high growth and positive output gaps.

Would the golden rule of deficit financing provide a feasible alternative to 'close-to-balance' rule?

A golden rule has been introduced in some countries as a device to control budgetary policy at the national, regional and/or local level. Could a golden rule have been a feasible alternative to 'close-to-balance' rule to ensure fiscal discipline in EMU?

Under the golden rule, governments can borrow only to finance public investment. The rationale behind this type of a rule is that as public investment results in the accumulation of government assets that yield return over an extended period, it should also be possible to allocate financing costs over time to those generations that benefit from investment.

Ideally fiscal rules should provide a set of incentives and/or constraints that make fiscal policy actions closer to 'desirable' outcomes. Earlier work analysing the impact of fiscal rules on government investment *inter alia* by Barro (1979) and Balassone and Franco (1999, 2000) have shown that the introduction of a deficit ceiling (balanced budget) can imply a reduction in public investment. From this viewpoint the golden rule could be a more desirable alternative. However, as suggested in the paper by Föttinger serious incentive problems (low-powered incentives, increasing possibility to opportunistic behaviour and complicated surveillance of outcomes and trends) related to the implementation of the golden rule would lead to overinvestment. Hence, once the agency-costs of overinvestment are taken into account balanced budget rule seems to be superior to the golden rule.

Basically, overinvestment under golden rule in a principal-agent framework discussed by Föttinger depends on the utility function of the agent: driving force for overinvestment is the assumption that government/politicians draw utility from investment expenditure, whatever their benefits to the society. Föttinger motivates this by public investment projects which have been undertaken in developing countries and former socialist economies despite small or no economic value to the society. One may however question the relevance of this kind of behaviour in the European context.

In general, part of the incentive problems related to the golden rule could be ameliorated by adopting constraints on public investment expenditure, such as the UK type constraint on government net debt.

Nevertheless, in EMU the golden rule would involve considerable practical difficulties, complicate the multilateral surveillance process and reduce transparency by providing leeway for opportunistic behaviour and 'creative accounting'. Governments would also have an incentive to classify current expenditure as capital spending.

Does 'close-to-balance' rule hamper cyclical stabilisation?

The overall set of fiscal rules in EMU puts emphasis on the working of automatic stabilisers as the main tool for fiscal stabilisation once Member States have achieved their medium-term fiscal positions close to balance or in surplus. In principle, this non-discretionary approach should guarantee that the behaviour of the actual budget balance is always counter-cyclical and hence, contributes to economic stability. Strict adherence to the medium-term orientation of the close-to-balance rule and symmetric working of the automatic stabilisers over the cycle are thus essential if deterioration of the underlying structural budget balance and pro-cyclical tendencies of the past fiscal policy are to be reversed in EMU countries.

An important challenge for this framework to function properly is related to the measurement of structural or cyclically adjusted balances. Without a 'correct' understanding of the size and sign of the changes in the structural budget balance, the monitoring of the compliance with 'close-to-balance' rule would become vague and could lead to wrong policy recommendations. Specifically, wrong assessment of the direction of the change in the structural budget balance would result in the tightening of discretionary policies during recessions and expansionary policies in booms if governments tried to keep structural balance unchanged on its estimated level.

Mills and Quinet discuss at length the well-known methodological problems in the cyclical adjustment methods used to estimate structural budget balances. These problems arise mainly for two reasons: firstly, output gap estimates might suffer from a procyclical assessment of potential GDP and secondly, insofar budget elasticities vary over the cycle, the cyclical adjustment of various revenue and expenditure categories based on average long term elasticities can produce biased results.

To avoid the methodological problems related to the operationalisation and surveillance of the 'close-to-balance' rule, the authors opt for a medium-term expenditure rule. However, giving spending rules preference over the 'close-to-balance' rule is not so clearcut. Much of the alleged advantages of spending rules depend, of course, on how they are formalised: as a fixed share of GDP, a fixed real/nominal growth rate, a fixed share of potential GDP, etc. Moreover, spending rules do not prevent governments from running pro-cyclical tax policies that offset the working of automatic stabilisers.

In more general terms, a fiscal strategy resting on expenditure control, while allowing the automatic stabilisers to operate freely on the revenue side, seems largely consistent with the rationale of the SGP and 'close-to-balance' rule. In fact, several EU countries have implemented various types of spending rules to complement the SGP at the national level. Constrained medium-term expenditure paths producing a gradual decrease in the government expenditure to GDP ratios could also be a useful instrument to create conditions for lasting reductions of tax burdens while safeguarding fiscal consolidation.

Does EMU need policy co-ordination beyond the SGP?

Possible credibility problems stemming from the lacking track record of the newly created central bank, too decentralised fiscal policies and insufficient policy co-ordination were frequently stressed in the literature before the launch of the euro (see e.g. Allsopp and Vines 1998, Artis and Winkler 1997). This was seen to lead to an unbalanced policy-mix with overly expansionary fiscal policy and too tight monetary policy resulting in higher interest rates, currency appreciation and lower growth than otherwise would be the case. Consequently, the maintenance of a balanced policy-mix, where national fiscal policies do not overburden the single monetary policy, is a crucial element for the success of EMU. Under

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[1] Sanctions are designed to have a pre-emptive deterrent impact rather than to fall automatically without any preventive mechanisms and possibility to correct the situation early enough. Moreover, the incentive under the chosen sanction system is to keep the excessive deficit as small as possible and to implement corrective actions sooner rather than later: the smaller the excessive deficit, the smaller the sanction.

[2] Sanctions consist of a fixed and variable components based on the difference between the actual budget deficit and the 3% limit. Fixed component is 0.2% of GDP and the upper limit for sanctions is 0.5% of GDP.

which conditions this kind of balanced policy-mix is possible to achieve? Does it require policy co-ordination that goes beyond the fiscal rules set in the SGP?

In principle, supranational co-ordination of economic policies in a monetary union would be beneficial if there exist sizeable spillovers between countries or between governments and the single monetary authority. Significant financial spillovers could arise in case that fiscal policies are perceived to run against the objective of price stability. However, the adherence of fiscal authorities to 'close-to balance' rule should lessen the probability of policy conflicts in EMU significantly. 'Close-to-balance' rule allowing fiscal stabilisation via the working of automatic stabilisers implies thus a passive rule-based policy co-ordination.

The issue of policy co-ordination in EMU under various types of shocks is the focus of the paper by Buti, In't Veld and Röger. The authors build on a theoretical model that encompasses explicitly the main elements of the EMU policy framework: fiscal policy constrained by 'close-to-balance' rule and a deficit limit, and monetary policy geared to maintain area-wide price stability.

To keep the theoretical framework tractable, the authors have opted for an approach that essentially involves a single monetary and a single fiscal authority and thus abstracts away the problem of multiple fiscal authorities. Because of this simplification, the results and policy conclusions refer strictly speaking only to situations where the shocks hitting the monetary union are symmetric and the policy response of various national fiscal authorities are broadly the same. From the viewpoint of analysing policy interactions and co-ordination this simplification need not however be considered overly restrictive as only shocks that have area-wide implications are relevant for the single monetary policy and thus for policy co-ordination. By definition, asymmetric shocks with a negligible impact on area-wide price stability do not trigger monetary policy response and the issue of policy co-ordination does not arise.

The authors show that the type of shock hitting the monetary union as a whole is crucial for the need and incentives to co-ordinate monetary and fiscal policies. Under demand shocks, as inflation and output move in the same direction, fiscal and monetary stabilisation do not conflict each other and hence, incentives for policy co-ordination are scant. However, conflict as well as incentives for co-ordination arises under supply shocks, because output and inflation tend to react in the opposite way.

While the simple theoretical setup is useful for analysing policy interactions under various types of shocks, they are far from describing the complex economic relationships that are in play and relevant to policy evaluation. To perform a more comprehensive analysis the authors have run simulations by the Commission's QUEST model, which lend support for their theoretical predictions.

On the basis of the analysis provided in the paper one could make a tentative conclusion that under demand shocks fiscal authorities should let the automatic stabilisers operate fully and monetary authorities should seek to maintain price stability. However, in the event of supply shocks, fiscal authorities might find it advisable to limit the working of automatic stabilisers to soften the policy conflict so that the central bank 'can move less' than otherwise would be the case to maintain price stability.

REFERENCES

Allsopp, C. and D. Vines (1998), "The Assessment: Macroeconomic Policy after EMU", *Oxford Review of Economic Policy*, No. 14.

Artis, M. and B. Winkler (1997), "The Stability Pact: Safeguarding the Credibility of the European Central Bank", CEPR Discussion Papers, No 1688.

Balassone, F. and D. Franco (1999), "Public Investment in the Stability Pact Framework", in M. Bordignon and D. Da Empoli (eds.), *Concorrenza fiscale in un'economia internazionale integrata*, Milano, Franco Angeli.

Balassone, F. and D. Franco (2000), "Public Investment, the Stability Pact and the 'Golden Rule", in *Fiscal Studies*, No. 2, pp. 207-29.

Barrell, R. and K. Dury (2001), "The Stability and Growth Pact, Will It Ever Be Breached? An Analysis using Stochastic Simulations", in A. Brunila, M. Buti and D. Franco (eds.), *The Stability and Growth Pact – The Architecture of Fiscal Policy in EMU*, Palgrave.

Barro, R.J. (1979), "On the Determination of Public Debt", *Journal of Political Economy*, No. 87.

European Commission (2001), *Public Finance in EMU – 2001*, European Economy, Reports and Studies.

COMMENTS ON SESSION II: EUROPEAN FISCAL RULES

Robert P. Hagemann[*]

Together, these papers provide a rich base on which to discuss the various conceptual and operational issues surrounding fiscal rules. Rather than comment on each paper separately, however, I will instead use some of the contributions to introduce a few considerations that might merit more discussion, here or in future research.

For participants in Economic and Monetary Union (EMU), there are at least two key and related reasons for wanting countries to adopt their own internal operational fiscal rules. First, a rule, if well designed and implemented, can provide the transparency and predictability to fiscal policy that helps other participants anticipate the national stance of fiscal policy. Second, a well designed rule, to the extent it helps achieve close to balance or surplus, will presumably help each country to be in a better position to use fiscal policy to smooth output fluctuations in the event of asymmetric shocks. But which rule should a country follow? Kopits and Symansky (1998) identify a wide range of rules that fall into one or another not mutually exclusive categories. There are rules targeting one or another budget balance, public sector borrowing, the level of debt, or contingency reserves, and a host of implicit rules. It therefore seems obvious that there is unlikely to be a "one size fits all" operational rule for all members or for all times.

Against this background, a question comes to mind in reading and thinking about the elegant and interesting paper by Buti, et al. The authors demonstrate that there are gains to fiscal-fiscal cooperation in monetary union when one country is hit by an asymmetric shock. But what if the budget rules don't allow for cooperation to achieve a lower deficit than otherwise? To use the example of the paper—a negative supply shock in a country 1 leads to a fiscal expansion there and, as a response to monetary tightening, to an expansion in country 2 as well. The paper shows that smaller deficits can be achieved through coordination. My question is: suppose country 2 has a strict rule of only allowing the automatic

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stabilizers to work fully, together with firm rules prohibiting offsetting discretionary spending cuts or tax increases. This suggests that, short of finding a "one-size-fits-all" operational fiscal rule, there may be limits to fiscal-fiscal coordination in the presence of some types of tightly enforced national budget rules. One wonders if this would not argue, in turn, for some sort of EU-wide stabilization fund, although this is not in the political cards yet. This may or may not be a rules-related issue, but it has always seemed to me that for fiscal policy in a monetary union to play a stabilization role, some centralized mechanism would be necessary, or certainly helpful.

I am not sure if this notion was implicit or not in the call in the Mills and Quinet paper for more active co-ordination in Europe. But their review of the problems surrounding the calculation and use of the cyclically-adjusted budget balance led them to some useful guidelines for fiscal policy and fiscal rules. They rightly point out, and illustrate vividly in their paper, that estimation of the output gap is indeed subject to quite some uncertainty, which in turn affects estimates of the impact of the cycle on the budget. They also rightly stress that the variability of the "true" elasticities over the cycle can be large, further weakening the confidence one can have in estimates of the cyclically-adjusted budget balance.

Dealing with the uncertainties surrounding estimates of the cyclically-adjusted, or structural, budget balance is increasingly important. First, structural changes in economies are affecting rates of potential output growth, thereby affecting estimates of the output gap and judgments about the fiscal stance. Second, structural changes affecting public revenues and spending are affecting underlying elasticities. It is for this reason that any one measure of the stance needs to be accompanied by complementary measures, such as:

(i) the IMF's fiscal impulse, as proposed by the authors;

(ii) the so-called arbitrary benchmark proposed by Blanchard (1990); and

(iii) a bottom up approach consisting of adding up the effects on the budget of discretionary measures.

One question is touched on but not really addressed in the papers. This relates to the merits, or lack thereof, of using predictably cautious budgetary projections as a feature of a budgetary rule. Many governments prepare budgets using relatively cautious growth assumptions (e.g., the United Kingdom, the Netherlands, Canada and Ireland). This has the obvious advantage of avoiding downside risks of a weaker budgetary

outturn. There are some possible disadvantages, however. First, if the degree of caution used in budget preparation (in other words, the extent to which growth is scaled down for budgetary projection purposes) *is not* systematic or known to market participants, this adds uncertainty to economic agents' decision-making process. This would not seem to be a desirable feature of a fiscal policy rule. But second, if the degree of caution *is* systematic and publicized, as it is in some countries, won't the private sector systematically anticipate this and respond accordingly, possibly offsetting the desired impact implied by the stance? It would seem to make more sense to build in caution through budgeting a contingency reserve, as suggested by Mills and Quinet.

Use of cautious growth assumptions points to a potential problem in dealing with windfalls. Often, fiscal over-performance is often treated as structural in nature (i.e., durable), leading decision makers to take discretionary actions that have long-term effects on spending or revenue. If, in the event, the over-performance turns out only to be a windfall, the structural balance could be adversely impacted.

REFERENCES

Blanchard, O.J. (1990), "Suggestions for a New Set of Fiscal Indicators," OECD, Department of Economics and Statistics, Working Paper, No. 79.

Kopits, G. and S. Symansky (1998), "Fiscal Policy Rules", IMF, Occasional Paper No. 162.

COMMENTS ON SESSION II: EUROPEAN FISCAL RULES

Xavier Denis[*]

I would like to congratulate the authors for providing insightful intuition and stimulating ideas.

Because of the time constraints, I can not claim to synthesise all papers of this panel that covers a large scope, so I would rather focus on some aspects that seem to me of major interest for policy-making. The most prominent common feature of these papers is probably the critical assessment of the Stability and Growth Pact (SGP) they make. It appears as an imperfect approach to achieve fiscal discipline and could even be counterproductive in some respect.

Quinet and Mills endeavour to define the conditions of efficiency of fiscal policy. This aspect is also discussed in Bernsden's paper for the case of the Nederlands. Considering that automatic stabilisers should operate in full to allow for the stabilisation impact of fiscal policy, it requires to be able to measure accurately the size of automatic stabilisers or in other terms to be able to correctly assess the cyclical adjusted budget balance (CAB), which is nothing but a proxy for the structural budget balance. It is a controversial issue since some public expenditures have to be defined as sensitive or non sensitive to the business cycle (interest payments, public wages...). Moreover, there exists great deal of techniques either based on statistical approaches or more fundamental (economic) approaches providing different results to estimate trends. Eventually, the estimates of CAB rely on the estimation of tax elasticities. For the last two years, many European countries have recorded substantial tax receipts in line with the growth upswing, and in many cases, more important than expected on the ground of average tax elasticities. Should we consider that these tax surpluses are a structural outcome due for instance to a structural change (the impact of a "new economy", for instance) leading to an increase in potential growth or it is only the positive and temporary consequences of a

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buoyant economic climate which may vanish at the next turning point of the business cycle?

The stabilisation properties of the budget vary across the cycle and also depend on the nature of underlying economic disturbances, meaning that an accurate assessment of the CAB and of automatic stabilisers implies a correct identification of shocks (demand versus supply-side) affecting the economy.

Föttinger carefully addresses the accountability and transparency of the general government national accounts, by focusing on the need for distinguishing consumption versus capital expenditures.

Endogenous growth theory teaches us that some types of public spending yield positive externalities and may increase potential GDP. A large amount of the economic literature has been devoted to the positive impact of education, research-development, investment in networks on economic growth. For this reason, it would be of particular interest of being able to clearly identify public consumption expenditure from public capital formation and it can be an argument to relax expenditure norms on capital expenditures. Nevertheless, a large part of capital formation does not only consist of physical but also human capital. Everybody acknowledges that increasing the level of education is probably one the most useful investment for an economy. However, public spending on education is mainly represented by the public wage bill of teachers which is obviously not categorised as capital formation.

An other point raised by Föttinger is the partial view on public finances provided by national accounts. Economic agents have become over the last twenty years more and more forward-looking: they take better into account economic policy measures in their decision-making process. I fully agree with the fact that there is a substantial need for improving the building up of national accounts by adding reliable estimates of off-budget liabilities on a regular basis (such as unfunded pension claims or off-budget guarantees). Regarding the net wealth criterion, I think it could be valuably included in a set of fiscal indicators useful to assess the solvency constrain on fiscal policy.

However, it is necessary to keep in mind that we have to cope with the estimate of non-market assets which represent in some cases a large part of general government assets. Moreover, as it could be recently

observed, the large fluctuations in the market value of telecommunications companies - still partially state-owned companies - have substantially affected the value of assets held by governments. It may be inappropriate to consider highly variable assets that may only temporary reduce the total debt.

In my view, Föttinger provides too a pessimistic view on the harmonisation process of standards of accounting in the public sector. A lot has already been done at the European level in that direction.

Buti's paper deals with the policy mix issue in the EMU and tries to provide some insights regarding fiscal and monetary policy co-ordination and co-operation. This paper is different from the other papers presented in this panel in his scope, since it does not develop a normative approach. It innovates since by taking on board the SGP fiscal rules and intends to define the conditions for an efficient policy mix in the EMU in a game theory framework. This topic has received a growing interest over the recent years and represents a crucial issue for the definition and implementation of fiscal and monetary policies in a decentralised framework such as the Euro-zone.

Among several other stimulating conclusions, this paper stresses on the fact that policy co-ordination may be looked at as an insurance against future shocks : it is true for demand shocks which is not surprising, that is also true for supply shocks, which is less intuitive.

The paper demonstrates in both a formal and clear manner that in all circumstances (whether there is a shock or not and whatever the nature of shock) that EMU economies are better off with policy co-ordination. This conclusion obviously brings a strong support for policy co-ordination in the EMU. And, if I want to be provocative in some way, I would say that this paper could be understood in a more critical manner, meaning the SGP does not provide in itself enough incentives or constrains toward policy co-ordination in order to reach an economic optimum.

Referring to my introduction remark on the critical assessment of the SGP made by all papers in this panel, I think it is necessary to recall that the 3% deficit ratio ceiling and the 60% debt ratio, combined with the "close-to-balance" provision of the SGP have been designed to avoid free-

riding behaviours but are also a pedagogical tool towards the public. They play a role to enlarge political support in favour of sound fiscal strategies and they have been successful in that sense. It is probably time now to pave the way for improving their economic outcomes in a context of one monetary policy versus fragmented fiscal policy framework, by thinking of co-ordination scheme within the EMU.