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Reform of the Stability and Growth Pact: Reducing or Increasing the Nuisance?•

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Abstract

This paper aims at providing a quantitative assessment of different proposals for reforming the Stability and Growth Pact by extending a counterfactual experiment performed in Eichengreen and Wyplosz (1998). Using estimated coefficients from a reduced form model, we simulate the path of the output gap for the largest Euro zone countries (France, Germany, Italy) after imposing limits to structural deficit according to different fiscal rules (structural deficit rules, golden rules and rules that incorporate the stock of debt). For each of these countries we can rank the different reform proposals in terms of output loss over the period considered.

Our analysis has the merit of using a uniform method and hence allow a comparison across countries and across rules. The main results of the experiment, which emerge robustly, are (a), that the golden rule would be the most beneficial both using individual country's criteria and global criteria; and (b) that the status quo, the Maastricht rule, is less restrictive than many currently debated alternatives.

JEL Codes: E62, E63, H62

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1. Introduction

The *Stability and Growth Pact* (SGP) complements the Maastricht Treaty in defining the framework for fiscal policy in Europe[1]. Very broadly speaking, it requires countries to maintain a fiscal position of close to balance or surplus over the cycle, and never to surpass the 3% deficit to GDP limit.

The long slowdown, which begun in 2001, and the subsequent deterioration of public finances well beyond the 3% limit, has strengthened the debate on whether the SGP is an appropriate framework for fiscal policy in the European Union. The debate has involved academic circles and policy makers alike. Reform proposals aimed at avoiding some of its shortcomings flourished. After a meeting in October 2004, French President Jacques Chirac, and German Chancellor Gerard Schroeder joined the camp of those calling for modifications that would allow a more active fiscal policy. The leaders of the two largest European economies, which repeatedly surpassed the deficit ceiling in the past few years, pleaded for the exclusion of research and development expenditure from deficit figures (a version of the so called "golden rule")[2].

The present paper avoids entering into the debate on whether a Stability Pact is necessary, and focuses on the reform proposals that are currently on the floor. Our scope is to rank these proposals in terms of the growth performance for the three largest euro zone countries. To make such an assessment, we perform a dynamic simulation exercise in the spirit of Eichengreen and Wyplosz (1998). We first estimate a reduced form VAR model, and then use the coefficients to simulate output gap figures resulting from the use of different rules, had them been followed in the past. We draw conclusions on the appeal of underlying rules, for each country as well as for the countries as a whole, in terms of the output gain or loss generated by the corresponding public finance adjustment strategy.

This counterfactual experiment has of course to be evaluated with caution, being subject to a series of methodological weaknesses. Nevertheless, it allows a uniform comparison across rules and across countries. Furthermore, the main results of the analysis emerge quite robustly: the first is that the golden rule would be the most beneficial both for individual countries and applying global welfare criteria. Thus, our results may help explain the Franco-German preference for such a rule. Overall, then, our results suggest that the current setup is not likely to be changed unless some kind of golden rule is proposed.

The outline of the paper is as follows. The next section quickly reviews the institutional features of the Stability Pact, and summarizes the main criticisms that have been raised

[1] The SGP consists of Council regulations 1466/97 and 1467/97, and of a protocol annexed to the Amsterdam Treaty, signed in June 1997.

[2] "Paris and Berlin Seek Relaxation of Fiscal Rules", *Financial Times*, October 27, 2004

against it. Then, section 3 enumerates the main reform proposals that are intended to strengthen the Pact. The following section describes the counterfactual example we perform in this paper, which we borrow from Eichengreen and Wyplosz (1998); the section also addresses some criticisms to this methodology, and describes the data we use. Section 5 is the core of the paper, and presents the results of our simulation exercise, detailing for each reform proposal the deviation from the benchmark case. Section 6 discusses the ranking of the different rules that emerges from the experiment, taking both global and individual countries' perspectives; we also draw the political economy implications of such a ranking. Finally, section 7 ranks the rules according to an alternative measure of welfare, the unemployment performance; such a ranking substantially confirms the findings of section 6, acting as a robustness check for our experiment.

2. The Stability Pact: Institutional Features and the Theoretical Debate.

Countries joining the euro were in need for a set of rules aimed at permanently guaranteeing the soundness of fiscal policy. In fact, the criteria set by the Maastricht Treaty only represented a requirement for entry in the EMU, and nothing in principle prevented countries from abandoning fiscal discipline once admitted to the single currency club. The Amsterdam Treaty (1997), better known as the *Stability and Growth Pact* (SGP) complements the Maastricht Treaty, in that its main objective is to make permanent the requirements for public finance soundness, and to increase transparency. According to the Treaty, each year member countries have to present a "Stability and Convergence Programme", to be examined by the European Commission and the Council. The programmes provide a medium-term objective for the budgetary position of close to balance or in surplus, together with the adjustment path towards the objective. Furthermore, the programmes give the main assumptions about expected economic developments together with description of budgetary and other economic policy measures being taken and/or proposed to achieve the objectives.

The Excessive Deficit Procedure (EDP), introduced with the Maastricht Treaty and better defined by the Stability Pact, states which deviations from the 3% budget deficit ceiling are acceptable, and gives the Council the right to sanction (by qualified majority) the countries not respecting it. The Treaty also stipulates that gross government debt should be maintained below 60% of GDP or, if higher, it should be “decreasing at a satisfactory pace”. However, when defining the operational content of the Treaty basic provisions, the SGP does not make any reference to the debt criterion.

The EDP has first been invoked for Portugal (for the 2001 deficit). The Council decision to "forgive" France and Germany, in November 2003, triggered an unprecedented clash with the Commission, which had recommended that an Excessive Deficit Procedure be opened. The Commission sought a judgement by the European Court of Justice, which ruled against the

Council in July 2004. In the spring 2004 the Excessive Deficit Procedure was also invoked for the Netherlands, Greece, and a number of newly admitted countries. As of today (January 2005), no country has been sanctioned yet.

The increasing deterioration of budgetary positions in a number of countries, overcame the reluctance of European institutions to deal with the issue of reforming the SGP. The European Commission (2002) proposed a reinterpretation of the rules that introduced more flexibility in the medium-term deficit target but also a more restrictive definition of the fiscal objective: it was clearly stated that the medium-term target applies to the cyclically adjusted budget balance, thus allowing automatic stabilizers to operate over the cycle. However, the new interpretation also required countries with structural deficits to improve their structural budget position of at least 0.5% of GDP each year until the "close-to-balance or surplus" target has been reached. The rate of reduction of structural deficit should be even higher in countries with high deficit and debt. In the fall 2004 the Commission (2004) has further advanced in that direction. First, it proposes to explicitly consider debt sustainability in the assessment on budgetary positions, by taking into account implicit liabilities that may influence the debt long-run dynamics. Second, the Commission agrees to consider country-specific circumstances when defining medium-term objectives of "close to balance or in surplus". Finally, it agrees to make more flexible the Excessive Deficit Procedure, by considering the budgetary impact of periods "of exceptionally weak economic growth" both when it identifies an 'excessive deficit' and when it emits the recommendations and deadlines to correct it.

The Stability Pact is rooted in the idea that the interdependence that characterizes a currency area imposes some form of fiscal discipline. In extreme situations this view is unchallenged: reckless fiscal policy and "abnormal" budget deficits would spill over to the other countries in the area and impose costs on them *via* excessive interest rates and/or inflationary pressures. But on the generalization of this principle to "normal times", and hence on the role of fiscal policy, there is much less agreement. The debate is all the more heated when considering that in a monetary union fiscal policy represents the only instrument left in the hands of governments to pursue their objectives. We do not tackle this issue here[3], for essentially two reasons. The first is that our objective is not to assess whether the SGP is desirable or harmful *per se*, but rather to give a quantitative assessment of the different reform proposals. And the second is that, regardless of their positions on the broad issue, the vast majority of the economists think that the Stability Pact in its actual formulation is flawed.

Before reviewing, in the next section, the main reform proposals, we summarize the flaws that have been highlighted in the literature.

[3] A good starting point, to look into the debate, is Brunila, Buti and Franco (2001). Two good taxonomies of the shortcomings of the Pact may be found in Wyplosz (2002b) and Buti, Eijffinger and Franco (2003).

The first set of problems with the Pact has to do with its *rigidity.* The most serious shortcoming is the one-size-fits-all feature of the SGP. This comes from the institutional design, that requires the 3% limit (and the medium run close-to-balance position) to be observed by all countries; but also from the fact that other important variables, like the stock of public debt, the need for infrastructures or the population age structure, which greatly vary across countries have been overlooked in assessing the soundness of the fiscal position. Any sensible evaluation of the sustainability of public deficit should consider these parameters, and hence call for different constraints.

Another important source of rigidity is that by focussing on annual budgets the SGP overlooks all the intertemporal issues linked to fiscal policy. These range from investment expenditures, whose return is spread over long periods (so that the same should hold for the cost), to the smoothing over different years of the adjustment costs linked to a downturn, or to current expenditures whose effects may be felt in the future (e.g. education). By imposing limits in terms of annual accounting, the SGP eliminates any intertemporal smoothing of fiscal policy. Blanchard and Giavazzi (2002) further argue that the lack of intertemporal structure of the Pact may even be harmful, by forcing governments to postpone structural reforms (namely of the pension system) that would yield benefits only in the medium-to-long run while imposing a short term burden on public finances (cuts in public system contributions in order to allow financing of private pension schemes).

This points to a related problem with the current setup, namely its *inconsistency.* Actual practice has up to now completely ignored the few references to debt that were present in the treaties. Although the Maastricht 60% reference value for the debt ratio is arbitrary and theoretical unfounded, it serves as a basis for the deficit target *via* the steady-state debt accumulation equation[4]. Nevertheless, the SGP fails to take into account this link, neglecting to design sanctions and to explicitly define a numerical rule for the "satisfactory pace" of reduction in the debt ratio. Furthermore, the SGP does more than simply neglect debt criterion. By changing the deficit target from 3% to 0% it also redefines implicitly the long term debt target: a 60% debt-to-GDP ratio would be obtained with an *average* 3% deficit. The average balanced deficit imposed by the SGP would yield a debt-to-GDP ratio converging to zero[5].

[4] The 3% target had been set on the basis of a rough calculation as the figure stabilizing the debt ratio at the 60% level, assuming a 5% increase in nominal GDP (3% of potential growth and 2% of inflation); if the GDP elasticity of deficit is 0.5 (the average EU value as calculated by the Commission), the limit would allow a 6% deviation from potential growth starting from a balanced structural budget. However, the 3%-60% rules are mutually consistent only if the 60% limit were to apply to net debt instead of gross debt.

[5] De Grauwe (2003) discusses at length this crucial but often unnoticed change of perspective from the Maastricht Treaty, to the zero debt target imposed by the SGP.

The third major shortcoming is the *lack of credibility* of the Pact and of the system of sanctions it proposes. Sanctions are tough (up to 0.5% of GDP) and delayed (in any case they are never imposed before the third year from the infraction). Furthermore they are decided by the Council, a body in which political motivation and technical assessments are inextricably linked, thus giving rise to closed door negotiations where 'anything goes'. No wonder that the SGP is perceived as non enforceable and non credible by the markets whose judgement focuses on long term sustainability issues that the Pact neglects. As a consequence in Germany and in France, both interest rates and public sector bond ratings do not seem to have reacted negatively to the breaking of the limit, nor to the dispute with the Commission that followed in the winter of 2003.

Another flaw of the Pact is the possibility that it forces EMU countries to conduct *procyclical policies* in downturn. Germany, struggling to reduce expenditure and to raise taxes on the brink of a recession, is a case in point. In theory, the SGP had been designed to provide enough flexibility, i.e. to provide the room for automatic stabilizers to play. The architects of the pact had nevertheless failed to consider two aspects: the first, as predicted by Eichengreen and Wyplosz ((1998); hereafter EW), is that, during the transition to the 'close to balance' position, countries would not be able to stabilize their economies if hit by a negative shock, a prediction that the downturn begun in 2001 proved correct[6]. The problems posed by the transition become even more evident if we consider that the starting point was, for most of the countries involved, a situation of high unemployment and low growth. The second and even more serious problem is the assumption that only automatic stabilization would be required and desirable. In fact, even at cruising speed, the Pact would limit any discretionary fiscal policy, thus potentially depriving democratically elected governments of the only tool left for carrying out their contract with the electorate[7]. Thus, whatever the initial intentions may have been, the SGP has constrained euro area countries to neutral, when not explicitly procyclical, fiscal policies. The rigidity imposed by the SGP during the downturn has a number of side effects: the blossoming of creative accounting practices that have further contributed to weaken the institutional credibility of the system; the reduction of "invisible" but crucial expenditures (like education, basic research, and investment), while unproductive but politically sensitive expenditures have not been touched.

Finally, the design of the pact is *asymmetric*, and contains no incentive to behave properly in good times: "the problem, with the Pact as presently framed is that it is all stick and no

[6] Buti and Sapir (2002) show that the largest countries of the euro area (France, Germany, Italy) did not use the slack given by the expansion of 1997-2000 to consolidate their budget. This finding may be seen as a proof that "the problem does not lie with the pact", but rather in the inappropriate policies of governments. These misbehaviours nevertheless were predictable, and should have been taken care of when designing an architecture whose main objective was precisely to avoid them. This points to the issue of the asymmetry of the SGP.

[7] Fitoussi (2002) deals at length with the democratic deficit of Europe's "economic government".

carrot; rewarding good fiscal behaviour in booms rather than, or in addition to, punishing bad behaviour in slumps, would surely make better sense" (Bean (1998)). Indeed, nothing in the SGP prevents countries from running pro-cyclical fiscal policies in good times, i.e. when experiencing above trend growth (Buti and Giudice (2002)).

To sum up, the SGP in its actual formulation lacks the flexibility required to respond to specific shocks (in a sentence: "too much stability, if any, and too little growth"); it is asymmetric, providing no incentive to reduce expenses or to increase revenues during strong growth; it has excessive uniformity of rules, notably between mature and catching-up countries, regardless of the rate and variability of growth, of investment needs, of contingent liabilities and of sustainability of public finances; it disregards the growth (and public investment) inter-temporal features; finally, it apparently neglects the long term sustainability of public finances, while in practice imposing a common and theoretically unwarranted rule of public debt dramatic reduction. All these shortcomings are visible, and require intervention, regardless of the general opinion one may have on the need for a rule constraining fiscal policy.

In the next section we will briefly review the suggestions for reforms aimed at mitigating or to eliminating these flaws of the Pact. As our scope is to give a quantitative assessment in terms of growth, we will not deal with 'qualitative' proposals[8].

3. The Reform Proposals: Which Rule for Which Kind of Nuisance?

The SGP has been under increasing pressure since fiscal positions of EMU countries deteriorated with the 2001 cyclical downturn. Proposals for revising the criteria of the SGP have multiplied at the same pace as criticisms of the current framework. In this section we briefly review the proposals that will be subject to evaluation in the following pages. We will recall how alternative fiscal rules stand up to the main criticisms that have been addressed to the present SGP setting, and then assess them by reference to criteria embodying the necessary characteristics of a good fiscal rule[9]: operational simplicity; flexibility in order to mitigate the effect of exogenous shocks; consistency with the goals of fiscal prudence and of preservation of the growth objective; enforceability by clear definition of objectives, escape clauses and penalties in order to reduce discretion; respect of national sovereignty and subsidiarity.

[8] In particular, there has been a large debate on a proposal, set forth by Wyplosz (2002a) on the creation of national independent budget authorities that should set the deficit targets.

[9] Kopits and Symansky (1998) enumerate the characteristics of "good" fiscal rules. Buti, Eijffinger and Franco (2003) assess the current European setup against these criteria and conclude that it does not perform badly, the only serious shortcoming being the scarce enforceability, and the lack of incentives to structural reforms.

The Balanced structural budget

In September 2002 Pedro Solbes, then European Commissioner for Economic and Financial Affairs, officially admitted what all observers had already realised since the beginning of the year. That is, the objective of a balanced budget in 2004, confirmed at the European Council in Barcelona in March 2002, was no longer attainable, even in terms of structural balance, and was thus postponed to 2006. But short-term softening was coupled with a more restrictive definition of the fiscal objective. The required balance was stated in terms of structural deficit and a yearly reduction of 0.5 points in the cyclically adjusted balance until 2006 was required for countries with structural budget deficits in 2002. According to the European Commission the cyclical component of the budget only played a marginal role in explaining the deterioration of the budget positions in the euro zone in 2001 and 2002, while being the major source of higher deficits in 2003.

The Commission proposal had a serious shortcoming: eight countries in the euro zone recorded a budget deficit in 2002 and 2003 in both nominal and structural terms (the latter higher than or close to 2%). Thus the latest Commission's requirement, by forcing the structural budget to balance by 2006, would have imposed a pro-cyclical stance to the euro zone. However, leaving aside the problems linked to the transition phase, the main advantage of a shift to structural deficit rules would be the increased flexibility in dealing with cyclical stabilization. In particular such a rule would never prevent automatic stabilizers from operating. On the other hand, the operational simplicity would be greatly reduced, by the reference to controversial magnitudes of the variables used in calculating the structural budget balance, such as the output gap and the NAIRU.

The golden rule

The most widely discussed option to modify the Pact is based on the double budget approach, according to which the budget is split into a balanced current account and a deficit-financed capital account. The *golden rule*, by drawing a distinction between current and capital spending is conceived with the intent of removing the bias against capital spending, thus shifting attention from a mere quantitative target to the quality of public finance. Since a higher public investment is supposed to increase the potential growth rate of the economy, notably for less mature countries, the golden rule is more compatible with growth and catching-up than the present SGP setting. It allows countries to spread the cost of durables over all the financial years in which they will be in use, and the burden of capital over the generations of taxpayers benefiting from it[10]. Moreover this rule implies debt-to-GDP

[10] In this spirit, the rule must apply to net investment and capital depreciation must be accounted for as current spending.

convergence to the ratio of public capital to GDP, rather than to the unwarranted level of 0% (Blanchard and Giavazzi (2004))

Those who reject the dual budget approach usually motivate their opposition by stressing fiscal soundness, since softening restrictions to current spending can be an obstacle to deficit and debt reduction (Calmfors and Corsetti (2003), Buti, Eijffinger and Franco (2003)). Furthermore, the golden rule implies that the rate of borrowing for investment is independent of the inflation rate and of the rate of growth of the economy (Buiter and Grafe (2004)). However, Creel (2003) argues that a golden rule would have endogenous discipline mechanisms: the interest payment expansion generated by public capital accumulation would impose a constraint to current expenditure growth, and hence at a certain point prevent further capital accumulation. Other criticisms concern the applicability of the rule and the difficulty to come up with a commonly agreed estimate of public net investment that would induce governments to resort to creative accounting in order to classify some current expenditure as investment spending[11].

As to the need for a rule in support of public investment, there is no clear-cut evidence that the SGP and fiscal consolidation had a crowding-out effect on public investment. The average rate of growth of gross public investment in the euro zone during the 1990s (2.8%) is only slightly lower than the average recorded in the previous three decades (3.5%). Furthermore, the decrease was not limited to the countries constrained by the treaty (Gali and Perotti (2003)). Accordingly, critics of this approach argue that, if the golden rule does not respond to an effective investment need, it may favour projects that are not necessarily profitable or worthwhile. They add that if the euro zone lacks infrastructure, a response at the supranational level through the common budget may be more efficient. Moreover, it is argued, are we sure that it is more efficient for future generations to inherit a higher stock of public capital rather than a lower stock of liabilities, which would allow them to react to their future needs more appropriately (Buti, Eijffinger and Franco (2003))? And, are we sure that physical capital is more beneficial to growth than other growth-friendly spending, such as education and health, improving human capital (Balassone and Franco (2001)?

Finally, the golden rule may present the major shortcoming of being as cyclically inflexible as the present rule. The issue of cyclical effects, however, can be addressed by a structural version of the rule.

The debt criterion

Shifting the focus from deficit to debt addresses both the issue of long term sustainability and of the excessive uniformity of rules. Higher growth and inflation rates in catching-up countries, allow them to run higher deficits without jeopardizing the sustainability of public

finances. Mature countries with sound public finances may afford stronger stabilisation, that is, greater scope for discretionary fiscal policy, than that allowed by automatic stabilisers in order to face asymmetric shocks. Moreover, we saw that the present setting implicitly imposes an unwarranted 0% debt ratio target. Most of the proposals to take into account debt require abandoning numerical rules in favour of discretionary general assessments of public finance soundness. Wyplosz (2002a), Pisani-Ferry (2002) and Coeuré and Pisani-Ferry (2003) all share this approach, even if their proposals differ. We discussed them at length in Saraceno and Monperrus-Veroni (2004). In general these proposals have the advantage of increased flexibility (fiscal sustainability is assessed on a country-by-country basis), but they do not meet the requirement of operational simplicity, in that the deficit target is not automatically displayed. Furthermore, the assessment of fiscal sustainability is quite arbitrary, and would likely lead to quarrels and disputes among countries and with the Commission. If, as proposed, countries also have to take into account implicit liabilities, the rule becomes even less simple and transparent.

An alternative proposal, put forth by Calmfors and Corsetti (2003) and the European Economic Advisory Group (EEAG, (2003)) is to impose a ladder of different deficit targets for different debt intervals (as shown in table 1). This ladder, where increases in the deficit ceiling for low-debt countries are matched by a reduction for high-debt countries, does not appear to be easily enforceable and therefore politically realistic.

Table 1: Possible ways of conditioning the deficit ceiling on the debt ratio.

Calmfors and Corsetti (2003)		*Economic Advisory Group (2003)*		
Debt ratio	**Deficit ceiling**	**Debt ratio**	**Deficit ceiling**	**Countries in the range (debt)**
		>105	0.5	Italy (106.2)
		95-105	1.0	Greece (103), Belgium (100.5)
		85-95	1.5	
>55	3.0	75-85	2.0	
		65-75	2.5	Austria (65)
		55-65	3.0	Germany (64.2), France (63), Portugal (59.4),
45-55	3.5	45-55	3.5	Netherlands (54.8), Sweden (51.8), Spain (50.8); Finland (45.3)
35-45	4.0	35-45	4.0	Denmark (45), UK (39.8)
25-35	4.5	25-35	4.5	Ireland (32)
<25	5.0	<25	5.0	Luxembourg (4.9)

Source: Public Finances in EMU-2003. All figures in percentage of GDP

[11] Setting the boundaries of public investment carries strong policy implications, as such a definition may

The asymmetric bias of the SGP is reduced by these proposals, since discipline and fiscal restraint are rewarded by increased room of manoeuvre and hence scope for stabilization in downturns. On the other hand, the proposed thresholds further introduce arbitrariness and complexity in the design of the rule.

If debt has to be taken into account, it is possible to design a rule, simple and automatic, that reduces the risks of arbitrariness and is symmetric (Saraceno and Monperrus-Veroni (2004)). We suggested weighing the deficit target with "relative debt", i.e. the ratio between the 60% Maastricht debt parameter and the country's actual gross debt in term of GDP. The deficit target would thus be computed as

$$d^i_t = \frac{0.6}{b^i_{t-1}} d_t ,$$

where d^i and b^i are deficit and debt of country i respectively, and d is the union wide target. Table 2 shows what the target would have to be, at the 2003 debt levels, in the two cases of an union wide target of 3% and 4%.

Table 2: Deficit ceilings weighed by relative debt ratios

	Debt (2003)	*Weighted deficit*			*Debt (2003)*	*Weighted deficit*	
		(a)	*(b)*			*(a)*	*(b)*
Luxembourg	4.9	36.7	65.3	Portugal	59.4	3.0	5.4
Ireland	32	5.6	10.0	France	63	2.9	5.1
United Kingdom	39.8	4.5	8.0	Germany	64.2	2.8	5.0
Denmark	45	4.0	7.1	Austria	65	2.8	4.9
Finland	45.3	4.0	7.1	Belgium	100.5	1.8	3.2
Spain	50.8	3.5	6.3	Greece	103	1.7	3.1
Sweden	51.8	3.5	6.2	Italy	106.2	1.7	3.0
Netherlands	54.8	3.3	5.8				

Source: Saraceno and Monperrus-Veroni (2004). All figures in percentage of GDP
Column (a) takes union wide deficit target of 3%. Column (b) takes a union wide deficit target of 4% (and coherently, a debt ratio target of 80%).

The advantage of this proposal lays in its operational simplicity, in the total absence of discretion (once we take for given the Maastricht parameters) in setting the deficit ceiling and in the creation of rewards for fiscal discipline. In fact, governments are encouraged to be virtuous in good times, in order to gain leeway for stabilization in bad times. Thus our proposal, while yielding similar dynamics (see Saraceno and Monperrus-Veroni (2004)), has more appealing properties than the others. On the other hand, the incentive to run down debt is a medium-long term one and does not affect the short term perspective of incumbent governments which could stop their consolidation effort just below the 3% (or 4%) limit and

become the tool used by the Commission to impose its priorities in terms of expenditures.

run up into difficulties at the first recession anyhow. Another shortcoming could be its weak viability due to political vetoes which may com from high-debt countries[12].

4. Description of Data and Methodology

To give a quantitative assessment of the reform proposals described above we follow the approach of Eichengreen and Wyplosz. They develop a counterfactual experiment, asking what consequences would the SGP have had, in terms of growth, had it been applied since the early 1960s. Such an experiment has many shortcomings, acknowledged by the authors themselves. The main one is that it represents a typical Lucas' Critique victim: were the pact applied in the past, agents would have embedded its consequences in their behaviour that would have been different. Actual data hence have a limited explaining power when trying to quantify the effects of alternative policies or, as in our case, institutions. The paper by Eichengreen and Wyplosz nevertheless retained a remarkable interest because it gave a measure of the magnitude of costs and benefits of the Pact. Furthermore, in our framework the Critique could be less problematic because we are interested in the relative performance of the different rules rather than in the absolute figures. Eichengreen and Wyplosz do the following: (1) estimate the reduced form of a standard model, specifically a two-equations VAR with output gap and inflation changes as endogenous. Among the exogenous variables, they introduce the fiscal impulse (that they define as the change in structural deficit). (2) Then, they use the estimated coefficients and an artificial series for the fiscal impulse (derived by capping total deficit at 3% for each period in which it surpassed the threshold) to build the simulated series for output gap and inflation. (3) The simulated output gap series is finally compared to the actual one, to compute the difference in output.

We use a similar procedure to rank the different reform proposals that we discussed. This is done by simulating fiscal adjustment strategies that would result from the enforcement of each of the fiscal rules. In doing so we focus on rules that are operationally simple and do not imply institutional reform. The following rules are tested:

- the Maastricht 3% ceiling to nominal budget balance ($s \geq -0.03$ where s is the nominal budget balance/GDP ratio);
- the balanced structural budget rule ($s_s \geq 0$, where s_s is the cyclically adjusted budget/GDP ratio);
- the structural deficit reduction at a constant rate of 0.5 point of GDP ($s_s(t) = s_s(t-1) + 0.05$ if $s_s(t-1) < 0$);

[12] In fact the 4% case would ensure political feasibility as the highest debt country, Italy, would have a deficit target of 3%, equivalent to the current one.

- the structural deficit convergence from its 1990 level to balance in 1998 ($s_s(t) = s_s(t-1) + x$, where x is the yearly average reduction rate in s_s);
- the "nominal" golden rule $s + (I - \delta k_0) \geq -0.03$, where I is the gross public investment/GDP ratio, k_0 is the public capital stock/GDP ratio at the end of the previous period that is assumed to depreciate at a rate δ
- the "structural" golden rule $s_s + (I - \delta k_0) \geq 0$;
- the cyclically adjusted budget/GDP ratio allowing for gross debt convergence (where the nominal primary balance/GDP ratio is computed as $s_p - d_0(r - g) = x$, and x is the yearly debt reduction in percentage of GDP). We assume that the rule required debt/GDP ratio to decrease from its level in 1990 to the Maastricht limit of 60% in 1998, to remain at that level afterwards;
- the relative debt rule ($s \geq -0.03 \cdot \frac{0.6}{d}$).

Data come from the OECD *Economic Outlook*, 74, December 2003 issue. Our analysis focuses on the three main countries of continental Europe, which, by joining the monetary union, fully accepted the institutional setup designed by the Maastricht and Amsterdam treaties. 1973 is the first year commonly available for the three countries concerned. We use the output gap calculated by the OECD according to the production function approach; inflation is obtained as a change in the Consumer Price Index; nominal budget balances are government net lending net of UMTS receipts; and net investment is computed by using the government consumption of public capital as depreciation. The structural deficit (surplus), consistent with an output gap calculated with the production function approach, is provided by the OECD.

The next section presents the results of our simulation exercise. We begin by estimating, for our dataset, the same reduced form estimated by EW. Then, we use the estimated coefficients to simulate the path of output and inflation corresponding to the fiscal adjustment paths consistent with the different rules. Each artificial fiscal impulse series is the change in the cyclically adjusted deficit that we would observe were the rule followed.

The artificial fiscal impulse series used in our counterfactual experiment is the simulated change in the cyclically adjusted deficit corresponding to the fiscal adjustment paths consistent with the different rules to be tested. Thus, for rules constraining nominal balances, such as the Maastricht rule, the nominal golden rule and the relative debt rule rules, we have to compute the corresponding change in cyclically adjusted terms. We start from the hypothesis that a change in the fiscal adjustment path in *t-1* influences growth and the output gap in *t* and that this change in the output gap has only an effect on the cyclical component of

the budget balance without affecting its structural component in the short term. We then calculate the new nominal budget balance in *t* adding to the original, unchanged structural budget balance the new cyclical component. The new cyclical component in *t* is obtained by applying the government budget elasticity to cyclical variations in economic activity calculated by the OECD (van den Noord, 2000) to the simulated output gap in *t-1*, consistent with the fiscal adjustment strategy implemented. Then, the nominal budget balance, thus obtained, is constrained according to the rule and adjusted for the cycle.

For fiscal adjustment strategies that result from rules constraining structural deficit, such as the structural balanced budget, structural balance convergence, the half point structural deficit reduction, the structural balance allowing for debt convergence and the structural golden rule, the original structural deficit is directly constrained.

Our procedure allows to render the output gap endogenous as a resultant of the implementation of different rules; in doing so, we respond to some of the criticisms addressed to the EW paper (e.g., Bean (1998)).

5. The Results

5.1 The Reduced Form Estimation

Table 3 shows the results of the reduced form estimation corresponding to table 8 in EW.

Table 3. Reduced form estimates

	France		**Germany**		**Italy**	
	Output Gap	Δ Inflation	Output Gap	Δ Inflation	Output Gap	Δ Inflation
Output Gap(-1)	0.952 (8.71)	0.688 (3.16)	0.828 (10.6)	0.113 (1.40)	0.672 (6.52)	0.758 (1.62)
Δ Inflation(-1)	-0.175 (-2.11)	-0.308 (-1.87)	-0.270 (-1.92)	-0.324 (-1.96)	-0.01 (0.44)	-0.377 (-2.37)
Fiscal Impulse	-0.382 (-1.31)	0.935 (1.61)	-0.446 (-1.92)	0.029 (0.122)	-0.318 (-2.40)	-0.73 (-1.23)
R^2	0.720	0.495	0.794	0.14	0.646	0.194
Obs.	24		32		38	

Data: OECD. t-statistics in parentheses.

Fiscal impulse is defined as the change in cyclically adjusted total budget deficit. For France and Italy it is retarded one period.

Following EW, we also used country specific dummies to improve the estimation fit. The coefficients are not reported

Our data set, in spite of revised figures for the output gap and the structural adjusted budget, yields the same qualitative behaviour. The effect of the fiscal impulse on the output

gap is in all cases lower than in EW[13], but only for France remarkably so. The coefficients for inflation are in line with those of EW, and as in their work the explanatory power of the regression is quite low[14].

5.2 The Maastricht rule.

The coefficients for the output gap in table 3 will be first used to evaluate what would the Maastricht Treaty have given in term of output gain or loss, were it in place since the early 1970s. We ran a dynamic simulation in which the fiscal impulse series was recomputed by imposing a 3% ceiling to nominal deficit. We then compared the results with those of the same simulation, obtained by using the actual values of the fiscal impulse (our "benchmark"). We could have used the actual values for the output gap and inflation, but then the difference with the simulated series would have also captured all the noise coming from the imperfect fit of the regression. By using simulated series as benchmark, we gain in coherence and homogeneity of the results. Table 4 reports for each of the three countries the average yearly output loss.

Table 4. Counterfactual: Maastricht rule

	France		**Germany**		**Italy**	
	Simulated	Benchmark	Simulated	Benchmark	Simulated	Benchmark
Output gap						
1973-2002	-0.42	0.12	1.57	1.57	-1.01	-0.98
1990-2002	-1.19	-0.79	1.95	1.82	-1.35	-1.22
Δ Inflation						
1973-2002	-0.23	0.01	0.21	0.21	-0.39	-0.37
1990-2002	-0.34	-0.18	0.19	0.18	-1.10	-0.99

Average yearly values.

The simulation shows that the Maastricht rule, when applied since the early seventies, would have been more constraining than the actual self-imposed discipline in France, (0.54 points of GDP of average loss), preventing the country from cumulating high deficits during the 1992-95 period. In Italy, the Maastricht rule would have been only slightly more restrictive, since the excessively expansionary stance during the second half of the 1980 and early 1990s forced it to put in place counterbalancing restrictive policies in the run-up to the euro. In Germany it would have been the same as expected, since the German public deficit

[13] The EW coefficients for fiscal impulse, in the output gap equation, are: -0.68 (France), -0.58 (Germany), and -0.43 (Italy). We thank C. Wyplosz who by providing us with his dataset allowed us to find a typo and to easily carry out the comparison between our dataset and his own.

[14] Notice that in these reduced form estimates we consider each country in isolation. In particular, we overlook spill-over effects of fiscal impulses. In fact, we chose to focus on the simplest possible reduced forms (as EW do) in order to highlight the direct effects of fiscal impulses.

rarely attained or violated the 3% limit in the period concerned (with the recent exception of the 2002-2004 period). The sub-period 1990-2002 provides the same result for France and Italy and more expansionary in Germany, preventing the building up of the deficit in 1991 and 1995 and thus the subsequent fiscal restriction in the years from 1997 to 1999. In Italy the respect of the 3% limit from 1990 would have entailed a slightly more restrictive fiscal stance, since it would have avoided the rise in the deficit which still took place at the beginning of the 1990s. The strong consolidation required during the first year of implementation of the Maastricht rule in our simulation would have been somewhat more significant than the actual cumulated fiscal restriction effectively carried out during the whole decade.

5.3 Balanced Structural Budget

The same exercise is now performed using a balanced structural budget rule. We capped to zero the cyclically adjusted deficit, while still allowing for structural surpluses when they occurred. Table 5 reports the results.

Table 5. Counterfactual: Balanced structural budget rule

	France		Germany		Italy	
	Simulated	Benchmark	Simulated	Benchmark	Simulated	Benchmark
Output gap						
1973-2002	-0.31	0.12	1.65	1.57	-1.09	-0.98
1990-2002	-1.80	-0.79	1.46	1.82	-1.52	-1.22
Δ Inflation						
1973-2002	-0.19	0.01	0.21	0.21	-0.48	-0.37
1990-2002	-0.64	-0.18	0.15	0.18	-1.31	-0.99

Average yearly values.

For the longer period, the results are quite similar to the ones produced by the Maastricht rule, with an average yearly output loss larger than the benchmark for France and slightly larger in Italy, and a somewhat more expansionary fiscal stance for Germany. As a matter of fact deterioration of the structural budget balance in the mid-1990s in France was only partially counterbalanced by further improvement; in Italy structural budget improvement during the three decades amounted to the same strong consolidation that would have been required in order to lower the structural deficit from the initial level of 8.3% to balance during the first year of implementation of the balanced structural budget rule. However were this rule applied from 1990 the results would have been less expansionary than the benchmark for Germany and more restrictive for France and Italy that started in 1990 from a higher structural deficit, thus requiring a stronger consolidation in a shorter time span to attend the structural

balance. The outcome in all three countries is also more restrictive than the one generated by the Maastricht rule since both the actual structural deficit and the one allowed by the 3% ceiling, where in 2002 still above the 0% limit.

5.4 Structural balance convergence

Next we performed a somewhat different exercise, by imposing convergence of the cyclically adjusted budget from its actual level in 1990 to zero in the pre-accession year (1998). We assumed the convergence process to take place at a constant yearly rate (equal to 1.6%, 0.4%, and 0.3% respectively for Italy, Germany, and France). From 1998 onwards, the structural budget is supposed to remain balanced in all countries

Table 6. Counterfactual: Structural budget converging to balance from 1990 to 1998

	France		Germany		Italy	
	Simulated	Benchmark	Simulated	Benchmark	Simulated	Benchmark
Output gap						
1990-2002	-0.77	-0.79	1.44	1.82	-1.39	-1.22
Δ Inflation						
1990-2002	-0.10	-0.18	0.05	0.18	-1.20	-0.99

Average yearly values.

Table 6 shows that output loss is larger than in the benchmark figures in Italy and less expansionary for Germany, whereas for France it is not significantly different. This result is rather intuitive since both countries started the decade with high structural deficits (12.4% and 4.5% respectively in 1990), thus requiring stronger convergence than for France, which cumulated higher structural imbalances later on during the decade, but showed an initial lower cyclically adjusted deficit (2.8%). As expected, the rule proves less restrictive than the simple balanced budget rule, and more restrictive than the Maastricht rule.

5.5 A half point yearly structural deficit reduction

In table 7 we suppose that countries had to fulfil, starting in 1990, the European Commission's September 2002 requirement of a yearly 0.5 point reduction in the cyclically adjusted deficit.

Intuitively, results in terms of output prove more restrictive for France and less expansionary for Germany than the effective fiscal stance. A lower loss in cumulated output appears however in Italy, where the consolidation process, especially in earlier years of the decade, has been much stronger. As compared to the rule imposing convergence to a balanced

structural budget at the eve of the EMU (paragraph 5.4) the pace of structural deficit reduction is much lower for Italy, slightly higher for France and the same for Germany. The resulting output loss is therefore less important for Italy which would have still showed a 6% structural deficit in 2002 and more significant in France, where a balanced structural budget would have been reached as early as 1994. Except for the Italian case, this rule proves more restrictive than the 3% Maastricht ceiling.

Table 7. Counterfactual: A half point yearly structural deficit reduction

	France		Germany		Italy	
	Simulated	Benchmark	Simulated	Benchmark	Simulated	Benchmark
Output gap						
1990-2002	-1.37	-0.79	1.44	1.82	-0.87	-1.22
Δ Inflation						
1990-2002	-0.38	-0.18	0.15	0.18	-0.65	-0.99

Average yearly values.

5.6 The Golden Rule

We ask what the effects would be in term of output growth had a golden rule been applied since 1990. The golden rule is obtained by applying the 3% Maastricht ceiling to the current budget balance, that is, the budget balance excluding investment net of depreciation. To avoid taking into account the potential effects of consolidation on the pace of capital accumulation in the past fifteen years, the average value of net investment in the three previous decades is used to reproduce investment behaviour in the nineties which would have been unconstrained in the counterfactual. Thus, the artificial series for structural deficit is obtained by summing the actual current balance capped at 3% and the past average investment expenditure, and then adjusting for the cycle.

Table 8. Counterfactual: Nominal golden rule

	France		Germany		Italy	
	Simulated	Benchmark	Simulated	Benchmark	Simulated	Benchmark
Output gap						
1990-2002	-0.14	-0.79	2.27	1.82	-0.97	-1.22
Δ Inflation						
1990-2002	-0.33	-0.69	0.20	0.21	-0.02	-0.99

Average yearly values

The impact on the output gap is the one expected: a lower output loss for France and Italy, a gain for Germany. The latter is due to the more expansionary fiscal policy that this rule

would have allowed in Germany, compared to the effective fiscal stance, which has implicitly respected a 3% ceiling during the decade. In the case of France the fiscal stance permitted by the golden rule is roughly more expansionary than the effective one, since, contrary to Germany, France's deficit was maintained above 3% on average during the decade. In the case of Italy, imposing a golden rule since the beginning of the nineties would have avoided further building up of the deficit and consequently severe consolidation at the eve of the EMU. The cumulated loss of output would then have been lower, but a rigorous fiscal stance would have anyhow been imposed during the first year of implementation of the new fiscal regime. Thus the nominal golden rule proves slightly less restrictive (more expansionary in the case of Germany) not only compared to the effective fiscal stance but also to the Maastricht criterion.

A structural version of the golden rule, like the one currently implemented in the United Kingdom, would have the advantage of increased flexibility, and we wonder what would the growth outcome be, had it been applied since 1990. The artificial series is obtained by applying the 0% ceiling to the current cyclically adjusted budget balance, and then allowing for investment. As before, the average value of net investment in the three previous decades is used to reproduce investment behaviour in the nineties.

Table 9. Counterfactual: Structural golden rule

	France		**Germany**		**Italy**	
	Simulated	Benchmark	Simulated	Benchmark	Simulated	Benchmark
Output gap						
1990-2002	-0.63	-0.79	1.88	1.82	-1.14	-1.22
Δ Inflation						
1990-2002	-0.18	-0.18	0.18	0.18	-0.91	-0.99

Average Yearly Values

Rather intuitively results relatively to effective output are quite similar to the ones stemming from the nominal golden rule, showing a more restrictive stance for Italy and for France, and a less expansionary one for Germany, than the nominal golden rule. In all cases the nominal golden rule would have allowed countries to run a structural deficit larger than the limit of around 1,5% permitted by the structural golden rule. France and Italy would have benefited from a lower loss in output than in the case the Maastricht criteria had been applied. On the contrary, for Germany the output gain would have been lower.

5.7 Cyclically adjusted budget allowing for gross debt convergence

The artificial series of structural budget used in the counterfactual exercise of table 10 is obtained by imposing convergence of the gross debt to GDP ratio from its 1990 level to 60% in the pre-accession year (1998). The convergence process takes place at a constant yearly

rate and the budget balance is endogenous. Given initial debt levels, the rule can be studied for Italy only.

Table 10. Counterfactual. Debt converging to 60% in 1998.

	Italy	
	Simulated	Benchmark
Output gap		
1990-2002	-1.33	-1.22
Δ Inflation		
1990-2002	-1.07	-0.99

Average yearly values.

Its consequences in term of output loss are quite similar to the Maastricht case. Curbing down the path of debt accumulation would have required a stronger improvement of the nominal and structural budget balance (a 2% deficit would have been allowed on average over the 1990-2002 period), especially in the earliest years of the decade, when the effective debt ratio continued to rise.

5.8 Budget Balance as a Function of Relative Debt

In Saraceno and Monperrus-Veroni (2004) we propose to modify the Maastricht rule by modulating it symmetrically according to the country's relative debt position. The 3% limit is multiplied by the ratio between 60% (the debt criterion) and the actual country's debt ratio. For highly indebted countries the rule hardens the Maastricht parameter, while a looser rule applies to countries with debt ratios below 60%. The debt is thus endogenously determined as a function of constrained deficit.

Table 11. Relative debt rule

	France		Germany		Italy	
	Simulated	Benchmark	Simulated	Benchmark	Simulated	Benchmark
Output gap						
1990-2002	-0.27	-0.79	1.74	1.82	-1.29	-1.22
Δ Inflation						
1990-2002	0.05	-0.18	0.08	0.18	-1.06	-0.99

Average Yearly Values

The rule proves less expansionary than the self-imposed discipline for Germany less restrictive for France and more restrictive for Italy, where, actual consolidation has been weaker than the one required were this rule in place during the nineties. For Italy the rule

would have allowed an average deficit of 2.3% during the decade (compared to the effective average of 6.4%), since the debt to GDP ratio, constantly higher than 60%, implied that the country was not even allowed to reach the 3% Maastricht ceiling. For France a lower starting debt to GDP ratio than Germany allowed a higher deficit ceiling (3.1% on average in France and 2.6% in Germany) at the beginning of the decade.

6. The Ranking of Alternative Reform Proposals

We saw in the preceding section that the simulated path often differs from the actual one for most of the rules. Here, we ask whether our counterfactual experiment allows to rank the different fiscal rule proposals and hence to draw policy implications for the debate on the SGP reform.

The following table summarizes the findings of the previous section, in terms of the different rules as compared with the benchmark. We focus on the period 1990-2002, because for the longer sample we only simulated the Maastricht and the balanced structural budget rules.

Table 12. Differences between rules' simulations and benchmark (1990-2002)

	France		**Germany**		**Italy**	
	Gap	Rank	Gap	Rank	Gap	Rank
Maastricht (5.2)	-0.40	5	0.13	2	-0.13	6 (5)
Balanced structural budget (5.3)	-1.01	7	-0.36	5	-0.31	8 (7)
Structural deficit convergence (5.4)	0.02	4	-0.38	6	-0.17	7 (6)
1/2 point structural deficit reduction (5.5)	-0.58	6	-0.39	7	0.34	1
Nominal Golden rule (5.6)	0.64	1	0.45	1	0.25	2
Structural Golden rule (5.6)	0.160	3	0.05	3	0.07	3
Debt convergence (5.7)					-0.12	5
Relative Debt (5.8)	0.514	2	-0.08	4	-0.07	4

Difference in average yearly values. The reference section numbers are reported in parentheses
For Italy parentheses denote the ranking were the debt convergence rule not taken into account.

A general result is the surprisingly large number of cases in which the simulated rules would have yielded a better outcome than the benchmark (positive differences). This may be explained of course by the deficit reduction efforts performed by all countries in the run-up to the euro, during the years considered.

6.1 Country-by-Country Analysis

We can first ask what rule would best fit each country taken in isolation.

France

Table 12 tells us that the rule that would have yielded a higher output gain for France, over the period considered, is the nominal golden rule, i.e. a 3% ceiling for nominal deficit net of public net investment expenditures. On average, France would have gained almost two thirds of a point of GDP every year with respect to the benchmark simulation. The relative debt rule comes next, followed by the structural golden rule. The other structural deficit rules (convergence to zero, structural balance, and the half point yearly reduction) would all have yielded a loss of output with respect to the benchmark. In particular, the Commission proposal would cost almost six tenths of a point of GDP per year. The fact that all the proposals yielding a structural budget rule are so penalizing for France seems to suggest that its actual behaviour overlooked this aspect, to focus on nominal balance.

Germany

The ranking for Germany is quite similar. The best rule is also the nominal golden rule, and structural rules occupy the bottom of the ranking. The only minor difference is that the Maastricht rule, i.e. the current status quo, ranks high in Germany, contrary to France (where at any rate it is not among the worse alternatives).

Italy

Italy presents a somewhat different picture. Consistently with its peculiar debt situation, debt related rules seem quite costly in terms of GDP loss. On the other hand, quite surprisingly, the best rule would be the Commission proposal that, if applied since 1990, would have given an average of 0.34 points of GDP more than the benchmark. We can conclude that the strong effort performed by Italy in the 1990s involved a reduction in the structural budget that was more important than what the Commission proposes. On the other hand, structural convergence and balanced structural budget are in the last places of the ranking for Italy as for the other countries.

6.2 Social Choice

Ranking alternative rules by country constitutes little more than a *curiosum,* given the present institutional situation in Europe. In fact, the rules of the game are decided at the Union level, and need a consensus among governments. Thus, we need to evaluate the rules at a global level.

A Global Welfare Approach

First, we can ask what kind of rule maximizes the average welfare of the three countries. Table 13 reports the rules ranked according to two different but related criteria. The first, is

simply the average individual rank in the three countries. The second is the weighted average of the output gap differences reported in table 12[15].

Table 13. Global Welfare Maximizing Approach

	Average rank	Average output gap difference
Nominal Golden rule	1.33	0.47
Structural Golden rule	3.00	0.09
Relative Debt	3.33	0.11
Maastricht	4.33	-0.09
1/2 Point structural deficit reduction	4.67	-0.29
Structural deficit convergence	5.67	-0.21
Balanced structural budget	6.67	-0.56

The rank is a simple average; the output gap difference is weighted by GDP.

As were to be expected by the single country cases, the global welfare maximizing rule is the nominal golden rule (twice first, one time second). Second comes the structural golden rule and the relative debt rule. The *status quo*, Maastricht, comes only at the fourth position entailing an average loss in output. The half point deficit reduction and structural deficit convergence precedes in ranking the other two options aiming at balancing the structural budget.

A Consensus Approach

The European decision making procedure, based on consensus and on veto power, makes another ranking interesting. In table 14 we adopted a sort of "minimax" approach. In fact rules were ordered by the lowest individual ranking. Such a procedure is the best fit to reflect the consensus spirit (such that a proposal preferred by all countries, except one that strongly opposes it, has lower chances of being adopted than a proposal that is second best for everyone).

Table 14. Consensus Approach

	Max Rank	Countries Blocking
Nominal Golden rule	2	(Ita)
Structural Golden rule	3	(Fra,Ger,Ita)
Relative Debt	4	(Ger,Ita)
Maastricht	6	(Ita)
1/2 Point structural deficit reduction	7	(Ger)
Structural deficit convergence	6	(Ger,Ita)
Balanced structural budget	7	(Fra,Ita)

[15] The weights are given by the relative GDP in 2004 (Source: OECD, *Main Economic Indicators*), i.e. 0.21 for Italy, 0.32 for France, 0.47 for Germany.

The result of this "consensus approach" is exactly the same than the welfare maximizing one. The nominal golden rule, first choice for Germany and France, and second choice for Italy, comes first by far. The Maastricht rule which comes second in Germany's preferences is vetoed by the two other countries. The half point structural deficit reduction, which is first in Italy's ranking, is vetoed by the two other countries.

6.3 A "Growth Without Stability" Pact?

This section compares the variance of the simulated output gap paths that emerge from our experiment. This is done in order to assess the stabilization properties of the different rules. A problem we encounter in such a statement is that a low variance is not necessarily an index of good economic performance; in fact, a stationary system has the lowest possible variance (i.e. zero). To avoid incurring in such a problem, we focussed, for each country, in the three proposals that ranked best in terms of average growth, and limited our analysis of stability to these cases (the others are available upon request). Table 15 gives a snapshot of the results.

Table 15. Output Variability for the Best Performing Rules

France		**Germany**		**Italy**	
Rule	Var	Rule	Var	Rule	Var
Nominal Golden rule	0.47	Nominal Golden rule	1.37	1/2 point structural deficit reduction	-0.67
Relative Debt	1.75	Maastricht	0.49	Nominal Golden rule	-0.16
Structural Golden rule	-0.05	Structural Golden rule	-0.98	Structural Golden rule	-0.26

Difference from the variance of the benchmark

From the table we can draw an important conclusion, namely that the Maastricht rule ranks quite low both in terms of growth and of stability. Moreover, structural rules are more efficient in stabilizing the output gap around its mean, since they allow for the full effect of automatic stabilisation. In particular, the structural golden rule is the only one that guarantees lower variability than the benchmark for France and Germany, and comes after the Commission proposal for Italy.

The second point that we want to stress is that the difference between the nominal and structural versions of the golden rule is particularly strong for Germany. This stems from the more important role that automatic stabilization plays in that country

7. Robustness: An Alternative Measure of Welfare

The conclusions of the previous section, namely the superiority of the golden rule over the other reform proposals, emerged quite clearly from our experiment. Nevertheless, the weak explanatory power of the base VAR regression of table 3 above requires results to be taken

cautiously, unless their robustness is somehow tested. Given the limited data available, we could not work on improving the fit of our base equations, so that we undertook a different approach. We carried on the same experiment of sections 5 and 6, but we substituted the output gap with unemployment as the dependent variable in the VAR. Then, we ran the same simulations as above and we looked at the ranking using cumulated unemployment as a measure of welfare[16]. Table 16 summarizes our findings.

Table 16. Rules ranked according to unemployment criterium

	Country ranking			Global Welfare	Consensus
	Fra	*Ger*	*Ita*		
Structural Golden rule	2	2	3	2.33	3
Nominal Golden rule	1	5	2	2.67	5
Maastricht	4	1	4	3.00	4
½ Point structural deficit reduction	7	4	1	4.00	7
Relative Debt	3	6	5	4.67	6
Balanced structural budget	5	2	7	4.67	7
Structural deficit convergence	6	7	6	6.33	7

1990-2002. Column 4 takes the average rank; column 5 takes the max rank.

We can see that the superiority of the golden rule is confirmed in this different setting as well, even if in its structural rather than nominal form. The latter is penalized by its bad effect on the German economy, which affects only marginally its average ranking, but would seriously undermine its possibilities of being implemented in a consensus approach. The other difference is that the status quo, represented by the Maastricht rule, comes immediately after the two golden rules in terms of average ranking, and would even be the second preferred reform, if we used the consensus ranking.

In spite of the methodological cautiousness that we invoked, we can highlight two results that emerge from our simulation exercises.

(a) The first is that the golden rule emerges as the one that is less restrictive. This is true in the individual country's preferences and when using global criteria; in the global welfare case, as in the consensus case. If as a measure of welfare we use unemployment instead of the output gap, the preference goes to the structural rather than to the nominal version of the rule. Nevertheless, the main message remains unchanged. This result is even more interesting if we notice that our exercise focuses on the *short term* effects of the rules, as we make no assumption in our simulations on how the potential of the economy evolves. If we had to consider the effects of public investment on potential growth, the conclusion in favour of the golden rule would probably be strengthened.

[16] The detailed results of the VAR estimation and of the simulations for each country are not reported for brevity, but are available upon request.

(b) In what concerns the existing framework, the Maastricht rule, the picture is less clear-cut. If we refer to the output gap, the *status* quo does not perform too brilliantly when compared to most of the alternatives currently being debated. For Germany individually, it is the second preferred alternative, but it ranks at best fifth for the two other countries. On the other hand, this result is not confirmed by our robustness test; on the contrary, when referring to unemployment, the Maastricht rule is second only to the structural golden rule.

Thus, the lesson that we draw from our exercise is that if a reform proposal has a chance to be implemented in the near future, this might be some form of golden rule, since, as our simulations show quite robustly, it is the one more likely to catalyse consensus among the three large countries of the euro area.

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