FISCAL RULES: THE STABILITY AND GROWTH PACT IN THE EUROPEAN MONETARY UNION

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INTRODUCTION

The slowdown in growth in 2008 and its possible implications for the level of unemployment created worries and doubts about the fiscal rules set in the Treaty of Maastricht and in the Stability and Growth Pact (SGP). It has been argued that these rules may represent an excessively binding constraint for appropriate countercyclical action, and that the attempts to reach rapidly a budget position "close to balance or in surplus" may worsen the slowdown in growth. The SGP has recommended that Member States of the European Union should set the medium-term budgetary targets which should be close-to-balance or in surplus. Governments will thus normally fund capital expenditure out of current revenue. This has two main consequences: (1) tax financing of investment may create a disincentive to spend on public capital, and (2) the switch from deficit to tax financing of investment affects the distribution of welfare across generations as it entails a double burden for current generations. In this work we will try to discuss if the rules set up for the European Monetary Union (EMU) can permanently reduce the public sector contribution to capital accumulation.

We will discuss a model where we will show how the introduction of a deficit ceiling, like the one imposed by SGP, can imply a reduction in public investment in a 2-period model. From this model we will show that under strict budgetary rules we are likely to observe a reduction in public investment. This reduction is bigger if the government can freely decide how to allocate the deficit resources in terms of consumption or public investment.

We conclude discussing the possibility and the conditions under which it is possible to cover the gap in public investment reduction via an increase in private investment. We will also discuss the role of the "Private Finance Initiative." This U.K. scheme means that the government in the short term does not face whole cost of a long-term Capital investment, but instead faces the cost over a period of time (whilst it leases facilities from the private sector).

FISCAL CONSTRAINTS AND PUBLIC INVESTMENT

We present a 2-period model in which we discuss the relationship between public investment, smoothing of consumption over time, and different kinds of fiscal constraints in a small open economy. The fiscal constraints in our model will be given by different restrictions on the amount of overall deficit that a country can run. We will discuss (1) the autarchy case in which the country cannot run a deficit, (2) the freedom case in which we do not have any explicit budgetary rule, (3) a general version of the SGP case in which there is a ceiling on the size of the deficit it is possible to run, (4) the U.K. case for the adoption of the golden rule without any budgetary ceiling, in this case it is possible to run a deficit only for financing public investment, and (5) the U.K. golden rule case with a budget deficit ceiling. We will use a Balassone and Franco (1999) model with some modifications to the budget constraints. We will introduce a no-Ponzi game condition in a 2-period model. This means that the deficit in period 1 (debt issued in period 1) has to be played back in period 2. In their analysis Balassone and Franco, consider a budget constrain $B_1 < B^+$ where B^+ is a unspecified level of deficit such to have economic stability. With this condition, they come up with a different solution.

Variables of the Model, Utility and Investment Function

We consider a 2-period model in a small open economy. In each period (t = 1, 2), the standard budgetary identity is:

in period 1,

$$B_1 = G_1 - T_1 \qquad \text{so } D_1 = B_1,$$

in period 2,

$$B_2 = G_2 + B_1 - T_2 \qquad \text{so } D_2 = 0$$

$$B_2 + B_1 = 0,$$

where G_t is the total expenditure, T_t is the total revenue, B_t is the overall budget balance, D_0 is the amount of debt issued in period 1 with payback in period 2. In this simple model, a country borrows in period 1 and pays back in period 2. We assume also that G_t comprise public consumption (C_t) and public investment (I_t).

For the utility and investment functions we assume that:

1. The target variable for the policymaker is the utility of disposable income $U(Y_d)$ defined as private income (Y_p), plus public consumption (C^P_t). Utility $U(Y_d)$ is an increasing and concave function of disposable income $U(c)$:

   $U'_{Yd} > 0, \quad U''_{Yd} < 0,$

2. The level of income at time (t) depends on public investment in period ($t-1$) such that:

   $Y_t = Y_0 + f(I_{t-1}),$

   where Y_0 is a given constant, we assume $f(I_t)$ is strictly concave to satisfies the following conditions:

   $f'(I_t) > 0; \quad f''(I_t) < 0; \quad f'_{I=0}(I_t) > 1;$

3. The interest rate is zero.

The 2–period structure of the model allows us to impose the restriction that in period 2 there is no incentive to undertake any investment, so we can set $I_2 = 0$ from the start. Thus the disposable income is:

$$Y_{d1} = Y_0 + B_1 - I_1 \qquad Y_{d2} = Y_0 + B_2 + f(I_1)$$

The policymaker's problem is then:

$$\underset{B_2, B_1, I_1}{Max} \quad U(Y_{d1}) + U(Y_{d2})$$

$$\text{s.t. } B_2 + B_1 = 0,$$

where Y_{d1} and Y_{d2} are respectively:

$$Y_{d1} = Y_0 + B_1 - I_1 \qquad Y_{d2} = Y_0 + B_2 + f(I_1).$$

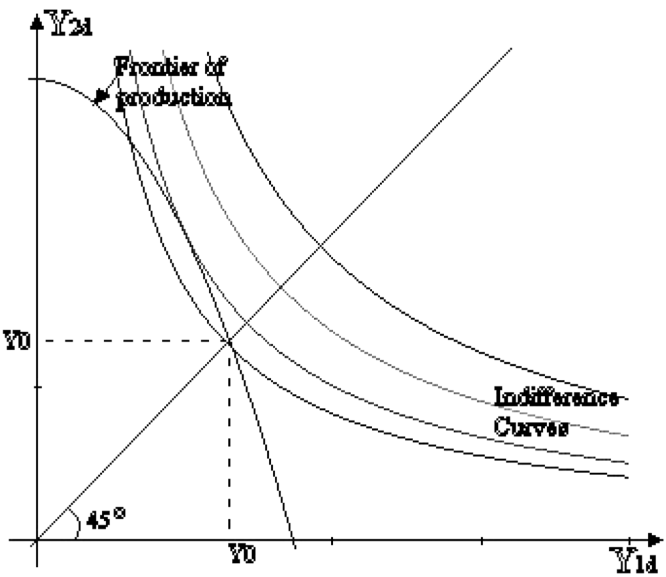
In Figure 1 we give a graphic representation of the indifference curves and the production frontier. The production frontier, given the characteristics of the investment function [$f'(I_1) > 0, f''(I_1) < 0$], is a decreasing and concave function of Y_{d2} in Y_{d1}.

In the next paragraphs we will discuss the different solutions as a function of different budget constraints.

The Autarchy Case: A Strict Interpretation of SGP

The first case that we consider is the autarchy one. This is when a country is not allowed to bor-

Figure 1: **The autarchy case, where $B_1 = B_2 = 0$**



row at all from abroad and the only way to have public investment is to finance it with current revenue. This case is very close to a strict interpretation of the SGP. Actually, as we have already seen in the previous section, SGP recommends (but does not impose), the member states to set a medium-term budgetary target "close-to-balance or in surplus." In our model this is the case when $B_0 = B_1 = 0$. The policymaker' problem is then:

$$\max_{I_0} \; U(Y_{d1}) + U(Y_{d2})$$

$$Y_{d1} = Y_0 - I_1 \qquad Y_{d2} = Y_0 + f(I_1)$$

The solution to the problem is quite straightforward and requires:

$$f'(I_1) = \frac{U'(Y_{1d})}{U'(Y_{2d})}$$

So, in this case, in period 0 the fiscal authority will invest, using current revenue, to achieve a higher level of overall utility between the two periods. In Figure 2 we give a graphical representation of this solution, the optimal point chosen by the policymakers (A) reaches the higher indifference curve tangent with the frontier of production. Point B is on the 45° degree line and is the case where the government does not invest. From a welfare point of view the fiscal authority will reduce the disposable income in period 1 in order to increase it more in period 2; therefore $Y_{d1} < Y_{d2}$.

The Absence of Any SGP Budget Constraints

The second case is the opposite one. Here there are no budget constraints so that the fiscal authority can freely decide the level of deficit that it will run in period 1. The fiscal authority can freely decide how to use the financial instrument in terms of investment or for smoothing disposable income over time. The absence of an explicit budget constraint rule does not imply the absence of any discipline: the policy maker will take into account that what it borrows in period 1 has to be given back in period 2.

The policymaker's problem is:

$$\max_{B_2, B_1, I_1} \; U(Y_{d1}) + \mathrm{U}(Y_{d2})$$

$$\text{s.t } Y_{d1} = Y_0 + B_1 - I_1 \qquad Y_{d2} = Y_0 + B_2 + f(I_1)$$

$$B_2 + B_1 = 0$$

We find that in absence of the budgetary rule the solution to this problem is:

$$U'(Y_{d1}) = U'(Y_{d2}) \Rightarrow Y_{d1} = Y_{d2}$$

$$f'(I_1 = I^G) = 1$$

In terms of the relationship between budget and investment, we have:

$$\textbf{(1)} \quad B_1 = \frac{I^G + f(I^G)}{2}.$$

In Figure 3 we have a graphical representation of this result. The fiscal authority running a deficit in period 1 will be able to reach point F where $Y_{1d} = Y_{2d}$. The level of investment is given by I^G where $f'(I_1) = 1$. Therefore the optimal solution involves: a perfect smoothing of utility over the two periods ($Y_{1d} = Y_{2d}$); but only a fraction of the deficit in period 1 is used for public investment ($B_1 > I^G$).

If we compare this result with the equilibrium found in the autarchy case (point A), we observe an obvious improvement in terms of overall utility. Without budgetary restrictions, we are able to reach a higher indifference curve with a higher level of public investment.

The SGP Case: The Presence of a Budget Ceiling

We can represent the SGP case in the same way as the previous case by introducing a deficit constraint. We also specify that the SGP does not discriminate between current and capital outlay. For our model this means that in running a deficit, a country has freedom to use resources for public investment or for smoothing disposable income over time. Let's assume now the general case where the budgetary rules impose a threshold for the deficit B^*. The previous problem began:

$$\max_{B_2, B_1, I_1} \; U(Y_{d1}) + U(Y_{d2})$$

$$\text{s.t } Y_{d1} = Y_0 + B_1 - I_1 \qquad Y_{d2} = Y_0 + B_2 + f(I_1)$$

$$B_1 \leq B^* \text{ Deficit constraint}$$

$$B_2 + B_1 = 0.$$

This problem has two acceptable solutions as a function of B^*.

Figure 2: **Indifference curves and production frontier.**

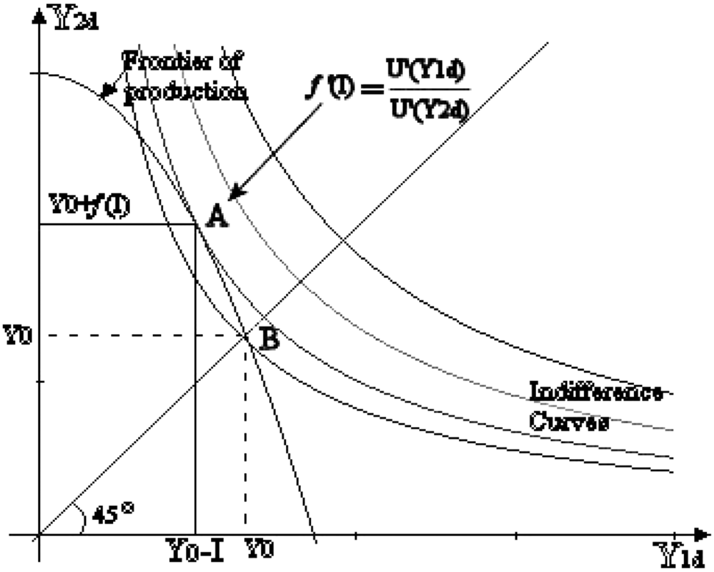
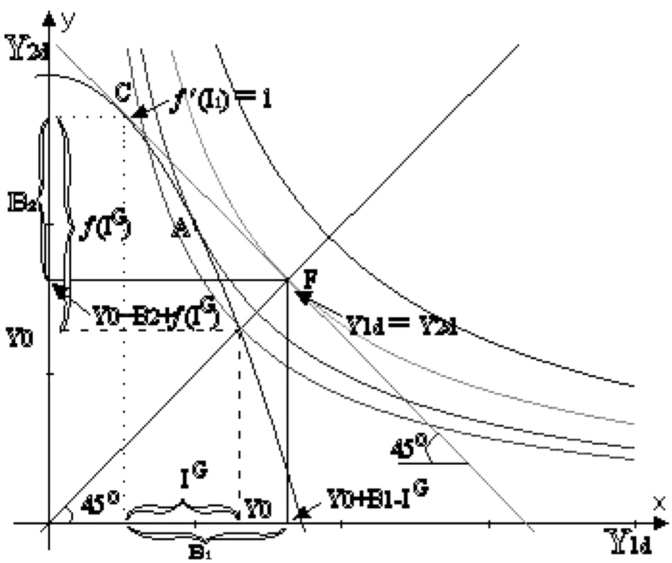


Figure 3: **The case in which fiscal authority does have any ceiling of budget constraint as the SGP one.**



1. **Deficit constraint nonbinding**

   In this case if:

$$B^* \geq \frac{I^G + f(I^G)}{2} \text{ “Nonbinding condition”}$$

$$f'(I^G) = 1.$$

   The deficit constraint is nonbinding, and the solution to the problem is the same one as in the previous section: perfect smoothing of utility and partial use of deficit for public investment:

$$Y_{1d} = Y_{2d}, B_1 = \frac{I^G + f(I^G)}{2}, \quad f'(I_1) = 1.$$

   In Figure 4 this case is represented by the point F (perfect smoothing of utility over the two periods).

2. **Deficit constraint binding.**

   This is the case:

$$B^* \leq \frac{I^G + f(I^G)}{2}.$$

   The deficit constraint is binding so the solution will be:

$$U'(Y_{d1}) > U'(Y_{d2}) \Rightarrow Y_{1d} < Y_{2d}$$

$$B^* = B_1 \; B_1 < \frac{I_1 + f(I_1)}{2}, \; f'(I_1) > 1.$$

   In this case perfect smoothing is no longer feasible; the investment level is lower than under the no budgetary rule hypothesis. The extreme case is when $B^* = 0$ and the solution will coincide with the one discussed in the autarchy case (point A in Figure 4).

It is interesting to note that, independently from the consideration of whether the budget constraint is binding or not, only a fraction of the first period deficit is used for public investment, and there is always an attempt to smooth disposable income over time. In Figure 4 the segment AF gives a graphical representation of this case. The larger B^* the more the optimal solution goes from A to F. If $B^* \geq [I^G + f(I^G)]/2$, the optimal solution will always be point F. Actually the segment AF is not a straight line, but the totality of a point that, given $B_1 = B^*$, presents the marginal rate of transformation $[f'(I_1)]$ equal to the marginal rate of substitution:

$$f'(I_i)\Big/_{B_1 = B^*} \frac{U'(Y_{1d})}{U'(Y_{2d})}.$$

In Figure 5 we give a graphical representation of the level of public investment I as a function of the budget ceiling B^*. For $B^* = 0$, we have the same level of public investment found in the autarchy case: the bigger is B^* the greater the level of public investment up to I^G. We also observe that the slope of this investment curve is flatter than the 45° line. This is due to the following: if the fiscal authority does have to use budgetary resources for public investment, only a fraction of the deficit will be used for public investment.

We can think of our model referring to the 3 percent SGP budget constraint as $B^* = 3$ percent. An interesting question that arises is whether in the SGP framework the 3 percent deficit constraint is binding or nonbinding. If the SGP budgetary constraint is nonbinding, its introduction should not reduce public investment. This is because the solution to the case where there is no budget constraint is the same as the solution where we have a budget constraint (B^*) which is not binding (point F in Figure 4). Unfortunately, empirical evidence suggests a different result. Balassone and Franco (1998) have empirically shown that in 1992, the year of the Treaty, the deficit ratio exceeded 3 percent in nine countries. In 1997, after the introduction of the budget ceiling, all these countries reduced the investment to GDP ratio. Over the same period for three out of six countries that in 1992 had a deficit less than 3 percent slightly increased their level of public investment. This could mean that for some countries the 3 percent threshold is not enough to reach the optimum level of public investment, which in our model is $I_1 = I^G$ such that $f'(I^G) = 1$.

The U.K. Case: The Golden Rule Without Any Budgetary Ceiling

As we have already seen in previous section, the golden rule of the U.K. government allows it to run a deficit without restrictions if it is for public invest-

Figure 4: **The case when the fiscal authority has a certain budget constraint $B_1 \leq B^*$. For $B^* = 0$ the solution is point A (the autarchyy one) for $B^* > 0$ we move from A up to F where $B^* \geq [I^G + f(I^G)]/2$ (nonbinding condition)**

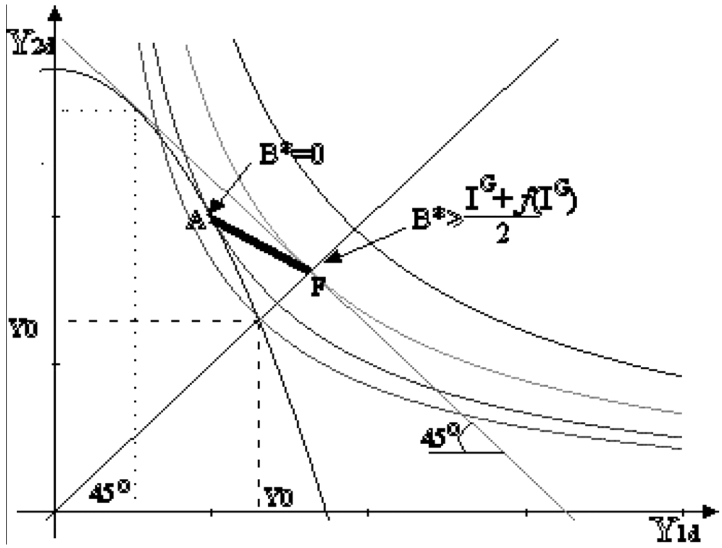
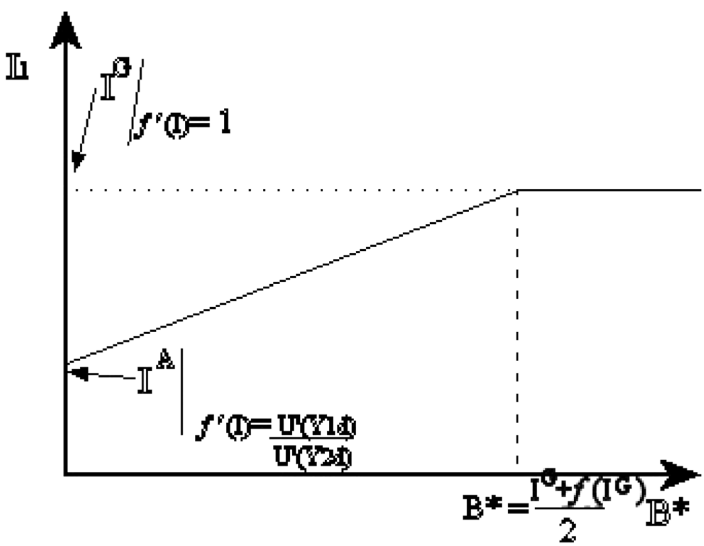


Figure 5: **Level of public investment as a function of the budget constraint B^*. In this case the fiscal authority has no a duty to use the deficit for investment.**



ment purpose. Under this U.K. golden rule, our stylized model produces the following problem:

$$\underset{B_2, B_1, I_1}{Max} U(Y_{d1}) + U(Y_{d2})$$

$$\text{s.t } Y_{d1} = Y_0 + B_1 - I_1 \text{ and } Y_{d2} = Y_0 + B_2 + f(I_1)$$

$$B_1 \leq I_1 \text{ “Golden rule constraint”}$$

$$B_2 + B_1 = 0.$$

The optimal solution requires that the golden rule constraint is always binding and the solution of the problem is:

$$Y_{1d} < Y_{2d}, \; B_1 = I^G, \qquad f'(I_1) = 1.$$

In the presence of the U.K. golden rule, there is no perfect smoothing of utility over the two periods; the investment level is the same as under the no budgetary rule hypothesis; all the deficit is used for public investment. This result is shown in Figure 6 by point G. Now it is possible to observe an improvement in utility for the autarchy case (point A), but it is not possible to reach the same indifference curve as the no budgetary rule hypothesis (point F).

This result is similar to the one found by Buiter (1997) in analyzing the U.K. code for fiscal stability. A central message of his work is that the U.K. golden rule constraint may prevent the fiscal authorities from facilitating private and public consumption over time. He says: “A central message of optimising dynamic economic theory is that the rationale for borrowing is consumption smoothing over time,” and in relation to the role of public borrowing, “Government borrowing should facilitate private and public consumption smoothing. Government borrowing and the use of government’s tax-transfer instrumentarium may permit liquidity-constrained households and firms to borrow on better terms than are available in the market.” Finally he refers to the U.K. golden rule: “…a golden rule constraint may prevent the fiscal authorities from acting appropriately, thus throwing too much of the burden of stabilising the economy onto monetary policy.”

United Kingdom in MU (Monetary Union)? Golden Rule with a Budget Ceiling?

In this last part we discussed what happens if we introduce a budget constraint ($B_1 \leq B^*$) into the golden rule framework For example we can assume that the policymaker takes account of the level of the deficit and debt that is consistent with financial market stability, so as to avoid the need to resort to restrictive policies. There can be also the case of United Kingdom joining the Monetary Union and still keep its financial code with the golden rule constraint ($B_1 \leq I_1$).

The policymaker’s problem is:

$$\underset{B_2, B_1, I_1}{Max} \; U(Y_{d1}) + U(Y_{d2})$$

$$\text{s.t } Y_{d1} = Y_0 + B_1 - I_1 \text{ and } Y_{d2} = Y_0 + B_2 + f(I_1)$$

$$B_1 \leq B^* \text{ Deficit constraint}$$

$$B_1 \leq I_1 \text{ “Golden rule constraint”}$$

$$B_2 + B_1 = 0.$$

The solution to this problem is similar to the one in the section on the SGP case, and it depends on the deficit constraint $B_1 \leq B^*$:

1. **The Deficit constraint is nonbinding**

   In this case if: $B^* \geq I^G$ “Nonbinding condition”
   then the deficit constraint is nonbinding and we have the golden rule solution (point G in Figure 7):

   $$Y_{1d} < Y_{2d},$$
   $$B_1 = I^G, \qquad f'(I^G) = 1.$$

2. **The Deficit constraint is binding.**

   This is the case when:

   $B^* \leq I^G$.

   The golden rule constraint is binding and the optimal solution is when

   $$Y_{1d} < Y_{2d}$$

   $$I_1 = B^* = B_1, \qquad f'(I_1) > 1.$$

Even here we can draw the solution as a function of B^*. The extreme case is when $B^* = 0$ and the solution coincides with the autarchy case one (point A in Figure 7). For $I^G > B^* > 0$, we move from point A up to G where $B^* = I^G$. We can call the segment AG the golden rule segment and we

Figure 6: **U.K. case of golden rule; fiscal authority can run deficit only for public investment.**

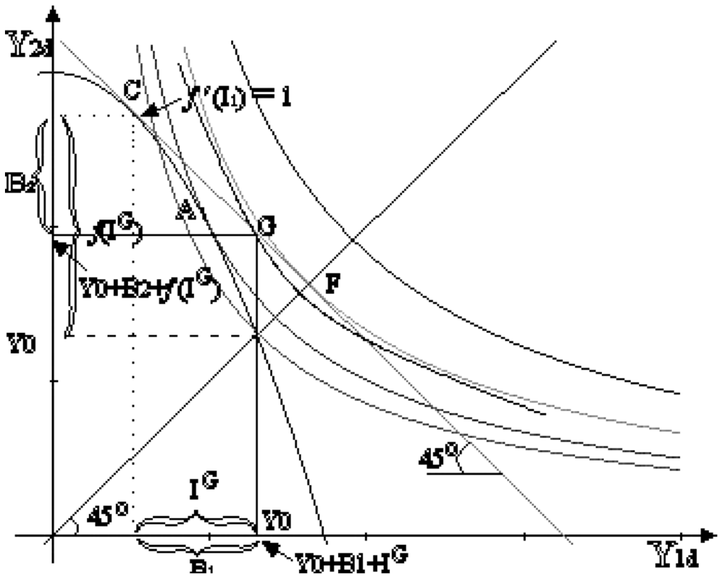
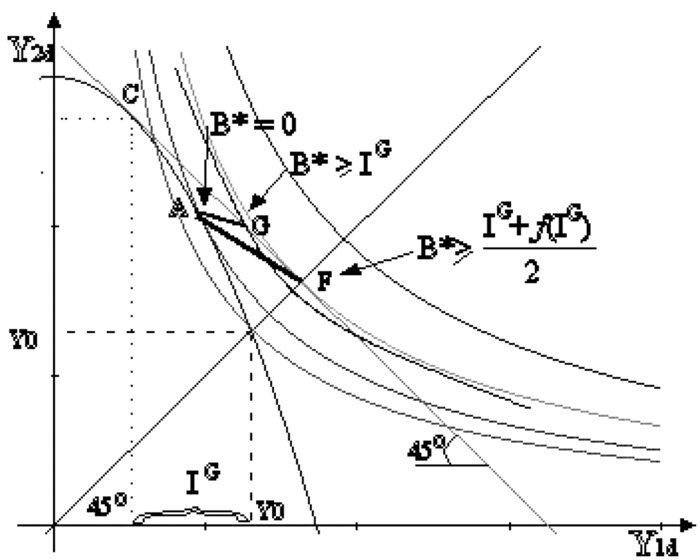


Figure 7: **The AG segment represent the case when the fiscal authority has two budget constrain 1) $B_1 \leq B^*$ and 2) $B_1 \leq I_1$. For B* = 0 the solution is point A (the autarky one) for B* > 0 we move from A up to G where $B^* \geq (I^G)$. $f'(I^G) = 1$. The AF line is the same of fig 4. 4 ant represent the situation where the fiscal authority has only one budget constrain $B_1 \leq B^*$.**



can compare it with the one AF that we find in the section on the SGP case.

We can also give a graphical representation of the level of public investment as a function of the B^* ceiling. This is done in Figure 8 with the line ACE. We observe that the ACE line is steeper than the one EFA, which we find without golden rule constraint.

A Comparative Analysis

In Table 1 we give a summary result of all cases analyzed, and below we discuss some general conclusions arising from a comparative analysis of the different cases observed:

1. The minimum deficit required in the U.K. golden rule regime to reach the optimal level of investment, (I^G such that $f'(I^G) = 1$) is smaller than the one needed in the absence of any budget constraint (SGP case).
2. If we introduce a budget constraint $B^* \geq B_1$, we have a nonbinding condition. The critical level for the nonbinding condition in U.K. golden rule is smaller than the one in the absence of the U.K. golden rule (SGP case).
3. If we introduce a strict budget constraint B^* such that $B^* \leq I^G$, we will reduce the level of investment in both regimes, but the reduction of investment with the U.K. golden rule will be smaller. If this constraint is more permissive, $I^G \leq B^* \leq [I^G + f(I^G)]/2$, we will only be able to reach maximum investment in the U.K. golden rule system. If this constraint is very permissive, $B^* \geq [I^G + f(I^G)]/2$, both regimes achieve the optimal level of investment. See also Figure 8.
4. In the case of prohibition of deficits, $B^* = 0$, both regimes have the same level of public investment I^A. In both cases public investment is financed by current revenue.
5. The U.K. golden rule regime limits the smoothing of utility over the two periods. This is a similar result found by Buiter (1997) analyzing the U.K. code for fiscal stability.
6. According to Balassone and Franco's (1999) empirical evidence, only for a few European countries—Denmark, Ireland, Austria—the introduction of a 3 percent budget ceiling does not seems to be a binding constraint on the optimal level of investment.

Figure 8: **Level of public investment as a function of the budget ceiling *B** in the U.K. golden rule case (line ACE) and in the one where there are any duty in use deficit for public investment. (line AFE)**

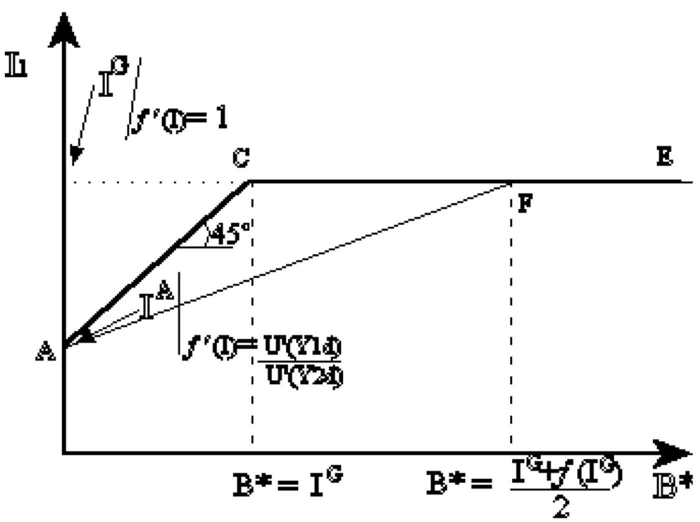


Table 1

A Stylized Synthesis of All Cases Examined

Cases	*In Real World*	*Budget Constraint*	*Golden Rule Constrain*	*Public Investment*	*Deficit*	*Smoothing of Utility Over Time*
Autarchy	Strict interpretation of the SGP	$B_1 = 0$	None	I^A $f'(I^A) = \frac{U'(Y_{1d})}{U'(Y_{2d})} > 1$	$B_1 = 0$	$Y_{1d} << Y_{2d}$
No budget constraints	European Countries before Maastricht Treaty	None	None	I^G $f'(I^G) = 1$	$B_1 = \frac{I^G + f(I^G)}{2}$	$Y_{1d} = Y_{2d}$
Budget constraint nonbinding	Few European countries after the Maastricht Treaty	$B_1 \leq B^*$ $B^* \geq \frac{I^G + f(I^G)}{2}$	None	I^G $f'(I^G) = 1$	$B_1 = \frac{I^G + f(I^G)}{2}$	$Y_{1d} = Y_{2d}$
Budget constraint binding	Most of European countries after the Maastricht Treaty	$B_1 \leq B^*$ $B^* < \frac{I^G + f(I^G)}{2}$	None	$I_1 = h(B^*)$: $1 > h'(B^*) > 0$ $f'(I_1) > 1$; $I^A \leq I_1 < I^G$	$B^* = B_1 < \frac{I_1 + f(I_1)}{2}$	$Y_{1d} < Y_{2d}$
UK Golden Rule	UK	None	$B_1 \leq I_1$	I^G $f'(I^G) = 1$	$I^G = B_1 = I_1$	$Y_{1d} < Y_{2d}$
UK Golden Rule + **Budget constraint nonbinding**	None	$B_1 \leq B^*$ $B^* \geq I^G$	$B_1 \leq I_1$	I^G $f'(I^G) = 1$	$I^G = B_1 = I_1$	$Y_{1d} < Y_{2d}$
Golden Rule + **Budget constraint binding**	UK in EMU?	$B_1 \leq B^*$ $B^* < I^G$	$B_1 \leq I_1$	$I_1 = g(B^*)$: $g'(B^*) = 1$ $f'(I_1) > 1$; $I^A \leq I_1 < I^G$	$I^G = B^* = B_1 = I_1$	$Y_{1d} < Y_{2d}$

The Role of Private Investment

The discussion above has highlighted how the introduction of a budgetary ceiling and the consequential tax financing of public investment (as implicit in the framework defined by the Treaty and the SGP) may discourage against public investment, with undesirable effects on growth and employment. The fiscal behavior of EU member countries in the '90s seems to confirm the relevance of this disincentive effect: fiscal consolidation has almost invariably implied some reduction in capital outlay. The issue is what action, if any, may be needed to help reduce the effect of fiscal consolidation on public investment.

An increase in the contribution of the private sector to the provision of public infrastructure has been pointed out. However, any attempt to integrate the private initiative in the provision and operation of the stock of public capital is not unproblematic.

More recently, attention has focused on the so called "private finance initiatives." These can be thought of as a form of leasing arrangements governments pay for a flow of services produced by the infrastructure rather than for the infrastructure itself, thus avoiding the incentive problem posed by the balanced budget rule. This implies that the government in the short term does not face the cost of a long-term investment, but encourages the private sector to do so. The government must commit to buying from the private sector provider for a long time. In this framework we do not have any restriction from the budget constraint, because the private sector will borrow to invest. Moreover, the government in some ways spreads the cost of investment between current and future generations avoiding the intergenerational equity problem.

While leasing allows the government to avoid the limits set on investment activity by a balanced budget rule, it may not be an efficient risk-sharing arrangement as:

1. Private agents may face higher risk-premia when borrowing;
2. The leasing payments may include a surcharge to cover private agents against the full risk of higher than expected costs of the project;

where market mechanisms do not ensure an efficient outcome, the traditional alternative is regulation. The literature on regulation is vast and this is not an appropriate place to discuss it. It is sufficient to note that regulation and monitoring problems remain to be solved if the promised advantages from private finance initiatives are to be realized.

CONCLUSIONS

The Maastricht Treaty and the Stability and Growth Pact attempt to define the conditions of sound public finances that are a necessary condition for the success of EMU, setting quantitative limits to deficit and debt in EU countries. The centralization of monetary policy and the impossibility of using exchange rates as a policy instrument make fiscal policy all the more important. Indeed, fiscal policy, together with structural policy, becomes the main instrument of national economic policy.

A broadly balanced budget reduces the possibility of spreading investment costs over time and can negatively affect the investment level. This effect can be especially relevant for those countries with high debt/GNP ratios during the transition period to a low debt level.

According to our model we have shown that the smaller the deficit ceiling the bigger the possibility of observing a reduction in public investment. We have also shown that this negative effect can be reduced partially by adding a golden rule constraint like in the United Kingdom, with the Code of fiscal stability in 1997. From Figure 8 it is possible to recognize that the smaller the budget ceiling B^* is, the more likely it is that the Stability and Growth Pact will produce a reduction in the level of public investments more than the U.K. golden rule does. Another observation from our model is that the SGP allows better smoothing of consumption over time compared to the U.K. golden rule.

The economic intuition behind these two results is straightforward. According to the SGP, each fiscal authority can freely decide how to use the deficit resource in terms of public investment or public consumption. On the other hand, the U.K. golden rule explicitly forbids financing public consumption with deficit.

The main weakness in our model is that it does not consider the tax distortions that arise on private investment when the government finances public investment or public consumption with current tax revenues. Analyzing the German case, Miller and Driffill (1998) observe that: "A key factor is that the Maastricht criteria governing debts and deficit effectively blocks the use of capital market to finance the cost of transition, forcing the costs onto current tax payers, and destroying new jobs in the process…."(n.2)

Our analysis had to sacrifice the explicit analysis of the role of tax distortions in the private sector in order to focus on capital accumulation in the public sector. Others, such as Miller and Driffill (1998), have given tax distortion an important and explicit role. Clearly a full analysis needs is required for both aspects.

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