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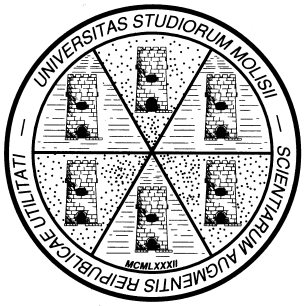

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Political support to public debt repudiation in a Monetary Union: the role of the geographical allocation of debt

by

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Abstract. The main arguments for the Stability and Growth Pact turn on the need to protect the European Central Bank against inflationary pressures from the fiscally prodigal countries (repudiation through inflation). Taking a political economy approach, in this paper we inquire into the conditions under which national governments may reach the decision for a partial or total repudiation of their debt. The main result produced by our model is that a debt management policy of lowering effective yields might be the dominant option for a self-interested government whose creditors consist in part of non-residents. On the basis of such result we argue that the impact of the fiscal position of the various member countries on the stability of EMU does not depend on the stock of debt but on the proportion of it that is held abroad.

JEL classification: D72, H63, E58, E62

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Introduction

A key element in the architecture of the EMU is the Stability and Growth Pact signed in Amsterdam in 1997. It lays down more precise and at the same time more stringent rules for member countries' fiscal policy conduct than those of Articles 103, 104 and 109 of the Treaty of Maastricht.[1] By making the excessive deficit procedures (EDP) governing the Commission's intervention in the case of deficits above the 3 percent ceiling more transparent, the Pact seeks to strengthen the fiscal constraints on member countries in order to prevent the excessive build-up of debt.

The institution of these constraints rests on the conviction that when fiscal policy is set independently by each country, a common monetary policy generates externalities that keep the market from imposing sufficient fiscal discipline. The argument develops around two main lines. Firstly, prodigal countries can exert pressures on ECB to reduce the real value of their debt via higher inflation.[2] An ECB that was not insensitive to the need of stabilizing output could give way, after the fact, to inflationary pressures. Secondly, when a member country's avowed intention not to meet its obligations threatens the financial stability of the entire Union, it is hard to believe that the ECB would not intervene bailing-out the distressed country, despite the fact that this is expressly prohibited by the Maastricht Treaty. The cost of the ECB intervention would ultimately be borne by all countries in the Union.

Thus, the crucial issue is the profligate country's decision to renege on its debt either implicitly (via surprise inflation) or explicitly by openly declaring the decision for a haircut. Taking a political economy approach in this paper we inquire into the conditions under which national governments may benefit from a partial or total repudiation of their debt. Furthermore we investigate the form of repudiation that might be observed in equilibrium.

Our starting point is the recognition that the decision to tax the debt, either explicitly or implicitly, has a wealth redistribution effect first of all within the fiscally prodigal country. Thus, such decision will depend on how the political dispute between debt-holders and tax-payers is internally composed. To formalise this conflict we consider a two period, two country economy with overlapping generations. The countries belong to a Monetary Union where monetary policy is decided by the Union's Central Bank (UCB) and fiscal policy is set independently by the individual countries.

Following the common agency approach of Bernheim and Whinston (1986) we model the political game as a menù auction in which conflicting lobbies (identified by families with different preferences about debt repudiation) offer monetary contribution in an effort to influence the governments' policy choices.

[1] The Treaty puts a ceiling of 3 percent of GDP on general government deficits. Infringement leads to official reprimands by the European Commission and eventually to pecuniary sanctions, unless the excessive deficit is due to exceptional, temporary causes. The Stability and Growth Pact specifies the conditions that may be invoked to avoid sanctions. A country with an excessive deficit can avoid the fine when it has suffered a 2 percent fall in GDP in a year. If the contraction of GDP is between 0.75 and 2 percent, suspension of the sanctions can be requested if the Council of Ministers agrees. In all other cases, countries must rapidly eliminate the excess deficit or face sanctions: first, non-interest-bearing deposits and then, after two years, actual fines.

[2] A profligate country can try to achieve its desired result by a vote in the Governing Council of the ECB. Otherwise a country might use political bargaining in an attempt to influence ECB decisions (see Dixit, 2000 on these points).

Each government maximizes an objective function consisting of a weighted sum of lobbies' contributions and of residents' welfare, net of a cost attached to explicit repudiation.

The main result produced by our model is that a debt management policy of lowering effective yields (repudiation) might be the dominant option for self-interested governments whose creditors consists in part of non residents. The model gives us also precise results concerning the form of repudiation emerging in equilibrium. As repudiation via inflation reduces the real value of domestic as well as foreign debt obligations, a country will certainly oppose inflation when it is a net external creditor. The necessary condition to favor inflation is to be a net external debtor. If members of the UCB' s board vote according to home government's instructions and decisions about inflation are taken by majority voting, then, in our two country model, inflationary pressures cancel out[3].

The only form of repudiation that might emerge in the second period is thus explicit direct taxation of debt. We show that the higher the value of domestic bonds held by non resident families and the relative weight attached by the government to residents' welfare, the higher is explicit repudiation. Under rational expectations lenders anticipate such result and in the first period only public obligations which will be certainly honoured can be sold (politically viable debt). Market discipline thus constrains the level of debt issued in the first period.

Insofar as explicit repudiation threatens the soundness of the banking system (due to the banks' exposure in government paper) and induces the UCB to bail-out the distressed country, market fiscal discipline cannot operate. Fiscal constraints (as the EDP) can thus be read as an instrument for correcting the inefficiencies created by moral hazard.

The novelty of our contribution rests on the proposition that political support to repudiation, and thus the likelihood of a fiscal crisis, does not depend on the stock of debt but on the share of it held by non residents. If this portion were nil repudiation will lack political support and the impact of a larger deficit on the stability of the Union would also be nil. The EDP would thus not have to be applied. Furthermore we claim, differently from Arnold and Lemmen (2001), that increasing the geographical diversification of banks' public debt portfolios would not reduce the risk of bank failures following a fiscal crisis in the Monetary Union[4]. According to our model, diversification, increasing the political support to repudiation, raises countries' default risk. The likelihood of a fiscal crisis will be thus positively affected by a greater diversification of banks' public debt holdings raising banks' vulnerability.

The rest of this paper is organized as follows. Section 2 reviews the related literature. Section 3 presents the model. Section 4 obtains the economic equilibrium. Section 5 illustrates the policy game. Section 6 derives the political equilibrium in the second period. Section 7 considers the politically viable stock of debt to be issued in the first period. Section 8 concludes.

2 Related literature

[3] Similar assumptions about the determination of the UCB's monetary policy choice are made, among others, by Beetsma and Bovemberg (2000) and Debrun (2000).

[4] See also Eichengreen and Wyploz (1998) on this point.

Theoretical support to the Stability and Growth Pact comes from a rapidly growing literature which investigates the interaction between the common monetary policy and decentralized fiscal policies employing dynamic models in the tradition of Barro Gordon's (1983) seminal contribution.

In Chari and Kehoe (1997)[5], first fiscal authorities issue nominal debt then, in the second period, the UCB sets the common rate of inflation so as to maximizes an objective function which depends positively on output and negatively on the amount of real debt obligations. The authors show that the larger the nominal debt the higher the inflation rate set in the second period. Lenders anticipate such result and in the first period require a higher interest rate. This makes all other fiscal authorities worse off. In the non-cooperative equilibrium free-riding produces over-accumulation of public debt.[6].

The same result is obtained by Beetsma and Uhlig (1999) and by Beetsma and Bovenberg (1999, 2001) in a two-period model of debt accumulation. According to these works the shortsightedness of national policy makers, whose decisions are politically distorted since they can be voted out of office, is responsible for the existence of a deficit bias in the first period (as in Tabellini Alesina, 1990 and Alesina Tabellini, 1990). The government successor of profligate policy makers will try to solve the inherited debt problem by making pressures on the Union Central Bank to boost inflation. An inflation bias arises because of the UCB's desire to reduce the amount of real debt obligation. By reducing the distortionary taxes needed to repay debt obligations the UCB realizes the goal of increasing employment and output.

All the previous papers share the view that, in absence of binding commitments, governments would, ex-post, always prefer to inflate away the debt (implicit repudiation). This stance lack micropolitical foundation; in fact, only departing from the standard assumption of representative agent the redistributive consequences and thus the political conflict generated by repudiation decisions can be investigated.[7]

Following this approach Di Gioacchino et al. (1999, 2000) assume that the incumbent government takes political decisions to maximise monetary contributions from interest groups. Thus, in deciding whether to repay the public debt or not, government gauges the political weight of debt-holders and tax-payers by the amount of money that each group is prepared to spend to support the policy decision it favours. In the hypothesis that debt is held entirely by residents, the decision entails a pure redistribution of resources between groups, and, as a consequence, the sum of money contributions from the two sides does not depend on government's choice. Government is thus indifferent between repudiating and honouring the debt. In this situation, even a tiny cost attached to repudiation is enough to make government always honour the debt.

In this paper we modify Di Gioacchino et al. (1999, 2000) by assuming that national debt is held also by foreign residents and by distinguishing between explicit and implicit repudiation. In this framework, we are able to provide precise conditions under which a self-interested government might choose to repudiate its debt. We assume that government does not care only for monetary contributions but it cares also for

[5] This model has been extended to heterogeneous countries by Giovannetti et al. (1997)

[6]In Chari and Kehoe's model debt is held entirely by non-European investors. A lowering of the real return to government bonds would hit agents whose welfare is not a factor in the UCB's objective function.

[7] The political economy literature of debt repudiation includes, among others, Tabellini (1991) Aghion Bolton (1990) Dixit and Lodregan (2000) and Di Gioacchino et al. (2003). See this last paper for a brief survey of this literature.

residents' aggregate welfare given government accountability to the general electorate. In this framework it is possible to show that, in equilibrium, government behaves as if it were maximizing a function which is a weighted sum of the welfare of resident and non resident families with resident families receiving a greater weight than non resident families. Foreigners, in fact, do not vote and their eventual welfare loss is not internalized as a political cost by the government. The government internalizes as political cost (gain) only welfare losses (gains) pertaining to residents.

When the government decides to repudiate public obligations, the welfare loss of foreigners corresponds to a welfare gain for all resident families, but, since foreigners do not vote, their loss is not internalized as a political cost by the government and thus it weights less. Political support to repudiation is then motivated by the political gain of repudiating debt partially held by foreigners[8].. It is important to underline that in this model repudiation would not receive political support if debt were entirely held by residents Thus, the main determinant of the political equilibrium is the share of national debt held by foreign residents: the greater is this share the greater the political support to repudiation.

3 The model

Consider a two-period, two-country economy with overlapping generations. The countries, *H (*domestic*)* and *F (*foreign*),* belong to a Monetary Union. Monetary policy is decided by the Union's Central Bank while fiscal policy is set by each national government.

3.1 Families

In each country there are two generations: parents and kids. Parents are born in period 1 and live two periods. Kids are born in period 2 and live only one period. Parents in the whole Union are a continuum of measure one and each parent has *n* kids.

In the first period there is no production and parents differ in their exogenous initial endowment of wealth. The initial wealth in country *K*, with $K \in \{H, F\}$, is distributed according to a known distribution Φ_K, with mean a_K and support $(0, \bar{a}_K)$, where $\bar{a}_K$ is a positive and finite real-valued scalar[9]. In the second period, at birth each kid receives one unit of labour that is inelastically supplied at a given gross real wage *w*, while parents receive a second endowment *e*.

In period 2 parents and kids take consumption decisions to maximize family's welfare. A family is composed by one parent and *n* kids. Consider the k-th family and let d_k and x_k denote, respectively, parent's and kids' consumption. We assume the following family utility function:

$$Z_k^2 = d_k + \alpha n V(x_k) \quad k \in H \cup F \qquad (1)$$

[8] Few theoretical works investigate this point. An exception is represented by Drazen (1998). He argues that there exists a strong political conflict around the decision to repudiate debt held by residents, due to internal redistributive consequences. Differently, residents' preferences over the decision to repudiate domestic debt held by foreign residents are homogeneous: they all prefer to repudiate partially or totally (depending on repudiation cost) and since foreigners do not vote this will be the (political) equilibrium.

[9] Lower-letter subscript indicates individuals; capital-letter subscript indicates countries. Thus, for example, a_k is individual wealth of the *k*-th individual in country *K*, while a_K is average wealth in country *K*.

where, α measures the relative altruism of parents with respect to children and $V(.)$ is a concave and twice continuously differentiable function.[10]

In the first period parents take consumption and savings decisions to maximize the following intertemporal utility function:

$$Z_k^1 = U(c_k) + \delta Z_k^2 \qquad (2)$$

where c_k is the k-th parent first period consumption, $U(\ )$ is concave and twice continuously differentiable and δ is the intertemporal discount factor.

In period 1 each parent, in country K, receives a lump-sum transfer g_K from government. The transfer is financed by issuing government debt. In period 2 debt is repaid by a combination of taxes on kids' income and on the outstanding debt. We assume that parents' endowments are never taxed.

The intertemporal utility function (2) is maximized under the family's budget constraints, one for each period, and the constraints of non-negativity for quantities consumed:

$$\begin{cases} c_k + s_k = a_k + g_K \\ d_k + nx_k \le e + n(1-\tau_K)w + \bar{r}_K^e s_k \equiv E_k \\ c_k \ge 0 \\ d_k \ge 0 \\ x_k \ge 0, \end{cases} \qquad (3)$$

where E_k is family's income in the second period, which comes from the tax-free endowment e, the after-tax labour income, $(1-\tau_K)w$, and savings s_k. The real expected net interest factor on savings in country K is denoted by $\bar{r}_K^e$. The labour income tax levied in country K, $0 \le \tau_K \le 1$, is decided by the government.

3.2 Governments Budget Constraints

If in the first period the k-th parent desires to save, he can either buy bonds issued by country H (b_k) or by country F (β_k). We assume that the two bonds are perfect substitutes. This means that the expected real interest factor on domestic public debt (r^e) must be equal, in equilibrium, to the expected real interest factor on foreign debt (ρ^e).Thus foreign and domestic portfolios in equilibrium earn the same expected real interest factor $\bar{r}_K^e = r^e = \rho^e$. For the sake of simplicity we impose a unique portfolio composition for all savers in each country K.

We summarize the above with the following:

Assumption 1

(i) $s_k \equiv b_k + \beta_k \ge 0 \quad \forall k$;

(ii) $b_k = \gamma_K s_k$ and $\beta_k = (1-\gamma_K)s_k$, with $\gamma_K \in [0,1]$.

[10] The assumption that the family utility function is quasi-linear is equivalent to assuming that it is measurable in monetary terms.

Assumption 1.*i* is, admittedly, very strong. We exclude private borrowing. This can be justified by referring to imperfections in capital markets that prevent individuals, who are consumption constrained in the first period, from borrowing[11]. In the first period, each government *K* must decide the amount of the lump sum transfer g_K. The transfer is financed by either domestic or foreign borrowing. Therefore, the first period government budget constraints in country H and F are, respectively:

$$b = \Pr(H) g_H \quad (4)$$

$$\beta = \Pr(F) g_F \quad (5)$$

where *b(β)* is the average amount of domestic (foreign) paper held by parents (resident and non-resident) and Pr(*K*) is the share of parents living in country *K*[12]. Let b_H (β_H) and b_F (β_F) be respectively the average amount of domestic (foreign) debt held by residents and by non-residents, it follows that $b = b_H \Pr(H) + b_F \Pr(F)$ and $\beta = \beta_H \Pr(H) + \beta_F \Pr(F)$.

In the second period government *K* can choose to repay its debt by a combination of taxes on the kids' labour income (τ_K) and on the outstanding debt. The political decision rule will be specified below.

The debt tax can be either explicit or implicit (i.e. inflation-derived). As for implicit taxation, recall that countries belong to a Monetary Union, thus, they cannot directly control the inflation tax. However, they might try to achieve their desired results about inflation by a vote in the UCB Governing Council.

Thus, the second period domestic government's budget constraint can be written as:

$$rb \equiv \left(1 - \theta_H^{\,E} - \theta^{\,I}\right) \cdot q_H b \le \Pr\{H\} \cdot n \tau_H w \quad (6)$$

where q_H is the nominal interest factor promised on domestic public debt in the first period, $\theta_H^{\,E}$ measures explicit taxation and $\theta^{\,I}$ implicit taxation,.

Similarly, foreign government's budget constraint is:

$$\rho\beta \equiv \left(1 - \theta_F^{\,E} - \theta^{\,I}\right) \cdot q_F \beta \le \Pr\{F\} \cdot n \tau_F w \quad (7)$$

A political–economic equilibrium must satisfy three conditions: (i) economic equilibrium: for any given policy, economic decisions are optimal for economic agents and markets clear; (ii) political equilibrium: the policy implemented by the government is weakly preferred to any other policy given the assumed decision rule; (iii) Rationality: economic agents have rational expectations.

4. Economic equilibrium

4.1 Consumption and Saving decisions

In this section economic agents take current and future policies as given. Solving the *k*-th parent optimisation problem, we obtain:

[11] We posit such assumption in order to give public debt the role of redistributing income over time. If capital markets were perfect, there would be no need to use public debt for such purpose.

[12] Obviously, $\Pr(H) + \Pr(F) = 1$.

$$c_k^*\left(a_k, g_K, \bar{r}_K^e\right)=\begin{cases} U_c^{-1}\left(\delta \cdot \bar{r}_K^e\right) & \text{if} \quad U_c^{-1}\left(\delta \cdot \bar{r}_K^e\right) < a_k + g_K \\ a_k + g_K & \text{otherwise} \end{cases} \tag{8}$$

which implies

$$s_k^*\left(a_k, g_K, \bar{r}_K^e\right)=\begin{cases} a_k + g_K - U_c^{-1}\left(\delta \cdot \bar{r}_K^e\right) & \text{if} \quad U_c^{-1}\left(\delta \cdot \bar{r}_K^e\right) < a_k + g_K \\ 0 & \text{otherwise} \end{cases} \tag{9}$$

From (8), optimal consumption is equal to $U_c^{-1}(\delta \cdot \bar{r}_K^e)$. However, if the *k*-th parent is wealth-constrained, he cannot consume more than a_k+g_K and his savings will be nil. From the last expression, average savings per parent in country *K* are given by:

$$s_K\left(g_K, \bar{r}_K^e\right)=\int_{U_c^{-1}\left(\delta \cdot \bar{r}_K^e\right)-g_K}^{\bar{a}_K}\left[a_k + g_K - U_c^{-1}\left(\delta \cdot \bar{r}_K^e\right)\right]d\Phi_K \tag{10}$$

Solving the second period optimization problem of the generic family *k* we get:

$$\begin{cases} x_k^* = x^*(\alpha) = V_x^{-1}\left(\dfrac{1}{\alpha}\right) \\ d_k^* = E_k - n x_k^* \\ \lambda_k^* = 1, \end{cases} \tag{11}$$

where λ_k^* is the Lagrange multiplier associated with the *k*-th family's budget constraint. The fact that the Lagrange multiplier is equal to one implies that the indirect utility function is separable in income (see below)[13]. Note that kids' consumption is independent of family income but is determined solely by the coefficient α, measuring relative altruism. Parents' consumption equals family income less children's consumption. We assume that the non-negativity constraints on the quantities consumed are satisfied[14].

4.2 Bonds Market Equilibrium

Since debt obligations issued by the two governments are perfect substitutes, a unique bonds market exists in the Monetary Union. The equilibrium interest factor, $r^* = \rho^*$, can thus be derived by the following market clearing condition:

[13] This follows from the quasi-linearity of the family utility function.

[14] The conditions of non-negativity of the quantities consumed are the following:

$$\begin{cases} x_k^* \geq 0 \Leftrightarrow \alpha \geq 0 \quad \forall k \\ d_j^* \geq 0 \Leftrightarrow E_j - n x^*(\alpha) = a + n\left[(1-\tau_F)w_F - x^*(\alpha)\right] + r b_j + \rho\beta_j \geq 0 \quad \forall j \\ d_i^* \geq 0 \Leftrightarrow E_i - n x^*(\alpha) = a + n\left[(1-\tau_H)w_H - x^*(\alpha)\right] + r b_i + \rho\beta_i \geq 0 \quad \forall i \end{cases}$$

Substituting the government's budget constraint into the last condition we get:

$$a + n\left[w - x^*(\alpha)\right] \equiv R_H \geq r\left(\frac{b}{\Pr(H)} - b_i\right) - \rho\beta_i \quad \forall i,$$

where R_H are the resources, before taxes and net of children's consumption, at the disposal of each resident family, independently of its possession of government securities. Since this inequality must hold for all values of b_i and β_i and since $\min[b_i] = \min[\beta_i] = 0$, we get an expression that sets the upper limit amount of debt that home government may issue: $b \leq \dfrac{R_H \Pr\{H\}}{r}$. In what follows we assume that $R_H > r\dfrac{b}{\Pr\{H\}}$.

$$b + \beta = \Pr(H)s_H + \Pr(F)s_F \qquad (12)$$

that is,

$$\Pr(H)g_H + \Pr(F)g_F = \Pr(H)\int_{U_c^{-1}(\delta \cdot r^*)-g_H}^{\bar{a}_H}\left[a_i + g_H - U_c^{-1}(\delta \cdot r^*)\right]d\Phi_H + \Pr(F)\int_{U_c^{-1}(\delta \cdot r^*)-g_F}^{\bar{a}_F}\left[a_j + g_F - U_c^{-1}(\delta \cdot r^*)\right]d\Phi_F$$

By Walras's law (12), (3), (6) and (7) imply that good markets are also in equilibrium.

If at least the poorest parents are wealth constrained despite the government transfer (i.e. if $g_K < U_c^{-1}(\delta r^*)$), it is easy to verify that [15]

$$r^* = r^*(g_H, g_F) \text{ with } \frac{\partial r^*}{\partial g_K} \geq 0 \qquad (13)$$

Since some of the constrained parents must be induced to forgo current consumption to buy public debt, issuing debt raises the equilibrium rate of return.

5. The political game

In the present section we consider the political game played, in the second period, by government H and resident and non resident families. Once the political equilibrium at time two is worked out, we will go back to the political and economic equilibrium at time one.

We focus on country H assuming that country F never explicitly default on public debt (i.e.$\vartheta_F^E = 0$) so that $\rho = (1-\theta^I)q_F$).[16] In the second period lump-sum transfers in each countries (g_H, g_F), bond holdings by resident and non-resident families($b_H, \beta_H, b_F, \beta_F$) and the nominal factor of interest (q_H, q_F) are given.

Following the approach of Bernheim and Whinston (1986), we describe the political game as a menu auction in which families offer government *H* money in an effort to influence its decisions. The government then selects the combination of θ^I, θ^E and τ that maximizes its objective function[17] under the budget constraint and the condition $\vartheta^I + \vartheta^E \leq 1$. The choice of the parameters θ^I, θ^E and τ is not independent but linked by the budget constraint. The government thus has only two independent control variables; consequently, in what follows we shall represent the government's decision as the choice of a pair (θ^I, θ^E). Since the money contributions offered by each family depend on family resources and on the

[15] When no parent is wealth-constrained the lump sum transfer is completely saved, in order to finance future taxation. In this case the average saving per family becomes $s_K(g_K, \bar{r}_K^e) = a_K + g_K - U_c^{-1}(\delta \cdot \bar{r}_K^e)$ and the equilibrium condition simplifies to $a \equiv \Pr(H)a_H + \Pr(F)a_F = U_c^{-1}(\delta \cdot r^*)$. Thus the equilibrium interest factor does not depend on government expenditure but only on the intertemporal discount rate and on the (marginal utility of) average initial wealth in the whole Union: $r^* = \frac{1}{\delta}U_c(a)$.

[16] In what follows, to simplify notation, we write ϑ^E instead of ϑ_H^E.

[17] Strictly speaking, the government does not choose θ^I which is set by the UCB, but it appoints a member of the UCB' board who will influence the UCB's choice by voting for the level of θ^I preferred by the government.

government's choice, we shall designate by $C_k = C(\vartheta^E, \vartheta^I, b_k, \beta_k)$ the contribution function of the generic family *k*. Knowing these functions, the government sets ϑ^E and compute its preferred ϑ^I so as to maximize its objective function which we assume to be a weighted sum of the welfare of resident families and of the contributions from all families, including non-residents, net of a cost attached to explicit debt repudiation, $\nu(\theta^E)$. Indicating the generic family resident in country H by *i* and the non resident family (resident in country F) with *j*,[18] government H's objective function is:

$$G_H(\vartheta^E, \vartheta^I) = \Pr(H) \cdot \left[\sigma \int_0^{\bar{a}_H} W_i \, d\Phi_H + \int_0^{\bar{a}_H} C(\vartheta^E, \vartheta^I, b_i, \beta_i) d\Phi_H \right] + \\ + \Pr(F) \cdot \int_0^{\bar{a}_F} C(\vartheta^E, \vartheta^I, b_j, \beta_j) d\Phi_F - \nu(\vartheta^E). \tag{14}$$

Assumption 2: $\nu(\theta^E)$ is a, non-decreasing, twice continuously differentiable, convex function:

i) $\nu(0) = 0$

ii) $\nu'(\vartheta^E) \geq 0$, $\nu''(\vartheta^E) \geq 0$

The parameter σ measure the relative weight assigned by government H to residents' welfare relative to monetary contributions. Supposing that voters are more likely to re-elect a government that has delivered a high standard of living, σ can be interpreted as an indicator of the incumbent government' fears of losing voters due to the implementation of socially costly policies (see Grossman Helpman, 1993). Thus implenting an inefficient policy (from the domestic social welfare point of view) bears a cost that stems from incumbent government accountability to the general electorate.

As far as inflation is concerned, we assume that each family tries to influence only its own government; thus, we have the following:

Assumption 3: Non-resident families do not try to influence government H's preferred ϑ^I; that is, $C_j = C(\vartheta^E, \vartheta^I, b_j, \beta_j) = C_j = C(\vartheta^E, b_j, \beta_j)$.

An equilibrium for the political game is constituted by a couple $(\vartheta^E, \vartheta^I)$ which maximizes the government's objective function and a vector of contributions, each of which is optimal given the government's choice and the contributions of the other families[19].

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[18] With *k* we continue to indicate a generic family or parent resident in country K

[19] Bernheim and Whinston (1986) have shown that a vector of contribution functions and a government-set vector of policy variables $\left(\{C_k^o\}_{k \in K}, d^o\right)$, are an equilibrium if and only if:

(i) every C_k^o is admissible;

(ii) d^o maximizes $G(d)$;

(iii) d^o maximizes $W_k - C_k + G \quad \forall \quad k \in K$;

(iv) $\forall \quad k \in K \quad \exists \quad d_k \therefore C_k(d_k) = 0$, where d_k maximizes $G(d)$.

See Di Gioacchino et al. (1999, 2000) for a discussion of these conditions.

Assuming that the contribution functions are differentiable,[20] the conditions that must be fulfilled in order to have an equilibrium[21] imply that the functions must be *locally truthful*[22]. In other terms:

$$\frac{\partial}{\partial \vartheta^E} C_k = \frac{\partial}{\partial \vartheta^E} W_k \text{ and } \frac{\partial}{\partial \vartheta^I} C_i = \frac{\partial}{\partial \vartheta^I} W_i \qquad (15)$$

Truthful contribution functions require that families offer money grants that reflect their true willingness to pay.[23] The condition that they be locally truthful requires that they be truthful around the equilibrium.[24]

Nash equilibria supported by truthful contribution schedules have an interesting property. The equilibrium pair $(\vartheta^{*E}, \vartheta^{*I})$ satisfies the following:

$$(\vartheta^{*E}, \vartheta^{*I}) = \arg\max \left\{ \Pr(H)(1+\sigma) \int_0^{\bar{a}_H} W_i \, d\Phi_H + \Pr(F)\varsigma \int_0^{\bar{a}_F} W_J \, d\Phi_F - \nu(\vartheta^E) \right\} \qquad (16)$$

where, by ass. 3, ς =1 when foreign families are actively involved in the lobbying activity, otherwise ς =0. Equation (16) says that, in equilibrium, the government behaves as if it were maximizing a function which is a weighted sum of the welfare of resident and non resident families. Resident families receive a weight equal to 1+ σ, while non resident families receive a weight equal to 1 or 0. In fact, by assumption 3, when choosing ϑ^I government H does not take into account foreigners' welfare. As for the choice of ϑ^E, since non-resident families are assumed to be actively involved in the lobbying activity, their welfare will enter government H's objective function but it will receive a lower weight than resident families. Foreigners, in fact, do not vote and their welfare loss is not internalized as a political cost by the government. The government internalizes as political cost only welfare losses pertaining to residents.

5.1 Political Preferences

Let us now consider resident and non resident families' political preferences about government H debt repayment decisions. Individuals' political preferences can be derived from their indirect utility function.

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[20] That is, that they are robust with respect to small errors of calculation; if the functions were not differentiable, then a family could suffer a large loss as a result of a small error in calculation.

[21] Conditions (ii) and (iii) in note 20 above.

[22] See Di Gioacchino et al. (1999, 2000).

[23] If we allow the possibility of non-binding agreements between players, then these *truthful* equilibria are stable with respect to possible deviations by coalitions of players (see Bernheim and Whinston, 1986).

[24] Domestic families with $q_H b_i + q_F \beta_i < q_H g_H$, i.e. $a_i < \frac{q_H}{\gamma_H q_H + \gamma_F q_F} g_H + U_c^{-1}(\delta \cdot r^*) - g_H$ will offer the following contribution function: $C(\vartheta^E, \vartheta^I, b_i, \beta_i | q_H b_i + q_F \beta_i < q_H g_H) = q_H (g_H - b_i) \cdot (\vartheta^E + \vartheta^I) - q_F \beta_i \vartheta^I$. The rest of domestic families will offer the following contribution function: $C(\vartheta^E, \vartheta^I, b_i, \beta_i | q_H b_i + q_F \beta_i \geq q_H g_H) = q_H (b_i - g_H) \cdot (1 - \vartheta^E - \vartheta^I) + q_F \beta_i (1 - \vartheta^I)$. The contributions to domestic government by foreign savers are represented by the following function: $C(\vartheta^E, b_j, \beta_j | \beta_j > 0) = q_H b_j \cdot (1 - \vartheta^E)$.

Allowing for the second period government H budget constraint, the *k*-th family's indirect utility function in the second period can be written as:

$$W_k\left(\vartheta^E,\vartheta^I,b_k,\beta_k\right)=d_k^*(\alpha)+\alpha nV\left[x_k^*(\alpha)\right]=E_k-nx_k^*(\alpha)+\alpha nV\left[x_k^*(\alpha)\right] \qquad (17)$$

Since kids' consumption is not affected by governments' policies, it follows that:

$$\frac{\partial}{\partial\vartheta^E}W_k=\frac{\partial}{\partial\vartheta^E}E_k \qquad \text{and} \qquad \frac{\partial}{\partial\vartheta^I}W_k=\frac{\partial}{\partial\vartheta^I}E_k \qquad (18)$$

To compute the effect of an increase of the debt tax on resident families' welfare, substitute the government budget constraint into the expression for families' income (E_i) to get:

$$E_i=e+nw+(1-\vartheta^E-\vartheta^I)q_H\left(b_i-\frac{b}{\Pr(H)}\right)+(1-\vartheta^I)q_F\beta_i \qquad (19),$$

which, substituted into (18), gives:

$$\frac{\partial}{\partial\vartheta^E}W_i=q_H\left(\frac{b}{\Pr(H)}-b_i\right) \qquad (20).$$

This shows how resident families' preferences about explicit repudiation depend on ownership of domestic securities. Wealthy families (i.e. those with $b_i > \frac{b}{\Pr(H)}$), oppose explicit repudiation, and the richer the family, the more they are hurt by this policy. By contrast, poor families (i.e. those with $b_i < \frac{b}{\Pr(H)}$), favour explicit repudiation, the more so the poorer the family.

To calculate the reactivity of non-resident families' indirect utility function to explicit repudiation of country H government' bonds, we substitute the expression for family's income E_j (where government F budget constraint has been substituted for)

$$E_j=e+nw+(1-\vartheta^E-\vartheta^I)q_Hb_j+(1-\vartheta^I)q_F\left(\beta_j-\frac{\beta}{\Pr(F)}\right) \qquad (21)$$

into (18) and obtain:

$$\frac{\partial}{\partial\vartheta^E}W_j=-q_Hb_j \qquad (22)$$

This indicates that all non-resident families are hurt by explicit repudiation. For unlike residents, they do not pay income tax to the government of country *H*, so they prefer that the debt be entirely repaid out of income tax.

Next consider families' preferences about the inflation tax. Unlike explicit repudiation which affects only domestic bonds, implicit repudiation reduces the real value of domestic as well as foreign securities. Substituting the expression for families' income into (18) we get:

$$\frac{\partial}{\partial\theta^I}W_i=q_H\left(\frac{b}{\Pr(H)}-b_i\right)-q_F\beta_i \qquad (23.a)$$

$$\frac{\partial}{\partial\vartheta^I}W_j=q_F\left(\frac{\beta}{\Pr(F)}-\beta_j\right)-q_Hb_j \qquad (23.b)$$

This shows that families' preferences about implicit repudiation depend on the (ex ante) value of their portfolio. Wealthy families (i.e. resident families with $q_H b_i + q_F \beta_i > \frac{b}{\Pr(H)}$ and non-resident families with $q_H b_j + q_F \beta_j > \frac{\beta}{\Pr(H)}$), oppose implicit repudiation. By contrast, poor families (i.e. those owning a portfolio whose value is less than average), gain from an inflation tax that reduces the real value of public debt in both countries. Note that wealthy families, rich in domestic and foreign bonds (i.e. resident families with $b_i > \frac{b}{\Pr(H)}$ and $q_H b_i + q_F \beta_i > \frac{b}{\Pr(H)}$ and analogous inequalities for non-resident families) dislike both kind of repudiation but implicit repudiation is worse as it reduces the real value of both domestic and foreign securities. On the contrary, the poorest families (i.e. resident families with $b_i < \frac{b}{\Pr(H)}$ and $q_H b_i + q_F \beta_i < \frac{b}{\Pr(H)}$ and analogous inequalities for non-resident families) favour both kind of repudiation but explicit repudiation brings them higher gains because it reduces only the real value of domestic bonds which otherwise have to be paid out of income tax, without devaluing the foreign bonds hold by those families.

5.2 Political equilibrium

Knowing families' contribution functions, the government chooses $(\vartheta^E, \vartheta^I)$ so as to maximize its objective function (14) under the constraint[25] $\vartheta^E + \vartheta^I \leq 1$.

Defining the Lagrangean $L(\vartheta^E, \vartheta^I) = G(\vartheta^E, \vartheta^I) + \mu(1 - \vartheta^E - \vartheta^I)$, the first order (Kuhn-Tucker-Lagrange) conditions are[26]:

$$\frac{\partial L}{\partial \theta^I} = (1+\sigma)\left(\Pr(F) q_H b_F - \Pr(H) q_F \beta_H\right) - \mu \leq 0 \qquad \vartheta^I \frac{\partial L}{\partial \theta^I} = 0 \text{ [27]} \quad (24a)$$

$$\frac{\partial L}{\partial \vartheta^E} = \sigma \Pr(F) q_H b_F - \nu'(\vartheta^E) - \mu \leq 0 \qquad \vartheta^E \frac{\partial L}{\partial \theta^E} = 0 \text{ [28]} \quad (24b)$$

[25] Despite the simplifying assumption of a unique portfolio composition for all families, we assume that family's endowment is private information, see Tabellini (1991). This implies that the amount of taxes paid by each family can not be higher than real wage and owned domestic bonds.

[26] These are obtained using expressions (20), (22) and (23).

[27] That is either (i) $\frac{\partial L}{\partial \theta^I} = 0$ and $\vartheta^I > 0$ or (ii) $\frac{\partial L}{\partial \theta^I} < 0$ and $\vartheta^I = 0$

[28] That is either (i) $\frac{\partial L}{\partial \theta^E} = 0$ and $\vartheta^E > 0$ or (iii) $\frac{\partial L}{\partial \theta^E} < 0$ and $\vartheta^E = 0$

$$\frac{\partial L}{\partial \mu} = 1 - \vartheta^{E} - \vartheta^{I} \geq 0 \quad \mu \frac{\partial L}{\partial \mu} = 0 \text{ [29]} \qquad (24c)$$

We are now in a position to determine government H preferences for implicit repudiation.

Proposition 1: *Government H preferences for inflation depend on the country's net external position. A net creditor will always prefer zero inflation; a net debtor will prefer a positive rate of inflation if its imbalance is sufficiently high.*

Proof: To determine the preferred rate of inflation consider expression (24a). Country H will prefer zero inflation if either:

(i) it is a net creditor (i.e. $\Pr(F)q_H b_F - \Pr(H)q_F \beta_H < 0$) or

(ii) it has a balanced position (i.e. $\Pr(F)q_H b_F - \Pr(H)q_F \beta_H = 0$)[30]

(iii) it is a net debtor (i.e. $\Pr(F)q_H b_F - \Pr(H)q_F \beta_H > 0$) and the following is met:

$$(1+\sigma)\left(\Pr(F)q_H b_F - \Pr(H)q_F \beta_H\right) \leq \sigma \Pr(F)q_H b_F - v'(1) \qquad (25)$$

The last conditions requires that the net marginal gain from implicit repudiation (left hand side) is lower than the net marginal gain from total explicit repudiation (right hand side). Given the convexity of the explicit repudiation cost function if (25) is satisfied for $\theta^E = 1$ a fortiori it is satisfied for each $\theta^E < 1$. ☺

From proposition 1 we can argue that a necessary condition for the government to be pro-inflation is to be an external net debtor**.** The reason is that if country H is a net external creditor then implicit repudiation harms resident families more than non-resident ones.

Recall that inflation is controlled by the Union Central Bank. The following specifies the decision rule used by the UCB:

Assumption 4: The UCB takes its decisions about inflation by majority voting of the members of the board. In case of ties, the UCB adopts an anti-inflationary policy.[31]

Corollary 1*: Under the previous assumption, in a two country world the UCB will choose not to give way to inflationary pressures from profligate countries.*

Proof: with two countries there are only two possibilities, either one is net creditor and the other is net debtor or they both have a net foreign investment position in balance. In both cases assumption 4 ensures the result. ☺

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[29] Which together with $\mu \geq 0$ requires either (i) $\mu > 0$ and $\frac{\partial L}{\partial \mu} = 0$ or (ii) $\mu = 0$ and $\frac{\partial L}{\partial \mu} > 0$

[30] We are assuming that when indifferent to implicit repudiation the government prefers not to inflate.

[31] We can justify the last part of the assumption pleading some cost of inflation.

We have thus shown that the fear that a profligate country may successfully pressure the UCB into loosening its monetary policy is not founded. First of all, whatever be the stock of public debt inherited from the past a country has got an incentive to pressure the UCB for inflation if and only if its external position is sufficiently deteriorated. Second, its inflationary pressures will be offset by opposite pressures from external net creditor countries.

When money creation offers no easy way out, politicians have only two alternatives left: either explicit default or raising taxes on labour income. In the following proposition we compute the equilibrium value of explicit repudiation ϑ^E when $\vartheta^I = 0$ and show that the higher the nominal value of domestic bonds held by non-resident families and the weight σ given to the welfare of resident families by the government, the higher will be explicit repudiation.

Proposition 2: *Under assumption 2, if* $\vartheta^I = 0$*, then the government will choose:*

i. *total default IFF* $\sigma \Pr(F) q_H b_F \geq \nu'(1)$*;* $\theta^{E*} = 1$

ii. *no default IFF* $\sigma \Pr(F) q_H b_F \leq \nu'(0)$*;* $\theta^{E*} = 0$

iii. *partial default IFF* $\nu'(0) < \sigma \Pr(F) q_H b_F < \nu'(1)$*;* $\theta^{E*} = \nu'^{-1}(\sigma \Pr(F) q_H b_F)$

Proof: Obvious from 24(b) and 24(c) ☺

Intuitively, when the constraint $\vartheta^E < 1$ is not binding, the value of ϑ^E which maximizes the government objective function corresponds to the point where the marginal cost of explicit repudiation $\nu'(\vartheta^E)$ is equal to the marginal gain from repudiation, $\sigma \cdot \Pr(F) q_H b_F$.

7. Politically viable stock of debt and political equilibrium in period 1

We now turn to a description of the political equilibrium in period 1. Under rational expectations , if $\vartheta^I = 0$, the expected net of tax factor of return on public debt,, $r^e = q_H(1 - \theta^{E*})$, must be equal to the factor of interest that clears the market for public debt in period 1, $r^*(g_H; g_F)$.

Recalling that $b = \Pr(H) g_H$, and given proposition 2, parents in period 1 realize that country H's public debt will be fully repaid in equilibrium and $q_H = q_F = r^*(g_H, g_F)$, if, and only if:

$$\sigma \cdot \Pr(F) r^*\left(\frac{b}{\Pr(H)}; g_F\right) \gamma_F s_F\left(r^*\left(\frac{b}{\Pr(H)}; g_F\right)\right) \leq \nu'(0) \qquad (26).$$

Therefore, the politically viable set of values of public debt is defined by the inequality

$$r^*\left(\frac{b}{\Pr(H)}; g_F\right) s_F\left(r^*\left(\frac{b}{\Pr(H)}; g_F\right)\right) \leq \frac{\nu'(0)}{\sigma \gamma_F \Pr(F)} \qquad (27)$$

No debt outside the politically viable set can be sold since nobody would buy it. It is immediate to verify that the upper bound of the politically viable set, implicitly defined by (27), is a decreasing function of the weight σ given to aggregate resident welfare in the government objective function. The higher this weight the higher the government political gain of repudiating debt. In fact, if debt were held only by residents repudiation would not affect aggregate welfare since among resident families losses an gains offset. When a share of debt is held by foreigners what is not repaid to them represents a net gain for all resident families. Furthermore, since foreigners do not vote, their welfare loss is not internalized as a political cost by the government. The government internalizes as political cost only welfare losses stemming from residents. As a consequence political support to repudiation will be higher the greater is the weight given by the government to aggregate resident welfare with respect to monetary contributions. Furthermore, since the higher the share of debt held by foreigners, the greater is the increase in residents' aggregate welfare stemming from repudiation, the upper bound of the public debt politically viable set will be a decreasing function of the relative size of the foreign country, $\Pr(F)$, and of the propensity to diversify financial investments of foreigners denoted by γ_F.

Consider now the determinants of the equilibrium intergenerational redistribution. The welfare effect on the k-th parent of marginally raising the transfer g_K is given by:

$$W_k^1 = U\left\{c_k^*\left[r^*(g_H, g_F), g_K\right]\right\} + \delta\left\{e + n\left[w - x_k^* + \alpha n V\left(x_k^*\right)\right] + r^*(g_H, g_F)\left[s_k^*\left[r^*(g_H, g_F), g_K\right] - g_K\right]\right\}$$

where we have substituted $\bar{r}_k^e = r^*(g_H, g_F)$.

The welfare effect of marginally raising g_K on the utility function of parent k is[32]:

$$\frac{\partial W_k^1}{\partial g_K} = U_c \cdot \frac{\partial c_k^*}{\partial g_K} + \delta r^*\left(\frac{\partial s_k^*}{\partial g_K} - 1\right) + U_c \cdot \frac{\partial c_k^*}{\partial r} \cdot \frac{\partial r^*}{\partial g_K} + \delta\left(s_k^* - g_K + r^* \cdot \frac{\partial s_k^*}{\partial r}\right)\frac{\partial r^*}{\partial g_K}$$

$$= \begin{cases} \delta\left(s_k^* - g_K\right)\dfrac{\partial r^*}{\partial g_K} & \text{if} \quad s_k^* > 0 \\ U_c - \delta r^* - \delta g_K \cdot \dfrac{\partial r^*}{\partial g_K} & \text{otherwise} \end{cases}$$

The impact of the policy transfer on parents' welfare is the result of two effects: a direct effect on income and an indirect effect, which operates through the change in the interest factor. The first effect is always non-negative.[33] The indirect effect is evaluated differently by different families. Issuing debt raises the rate of return and this redistributes income from poor to wealthy families. Hence this term is positive for families wealthier than average, (i.e. those with $s_k^* > g_k$) but it can be negative for poor families.

Thus, even when debt is eventually repaid, a political conflict exists in the first period concerning how much debt to issue. Since the main focus of our analysis was to investigate on the political determinants

[32]This is computed noting that each additional unit of g_K is either consumed, if the family is wealth constrained, or saved. Therefore $\frac{\partial c_k^*}{\partial g_K}$ and $\frac{\partial s_k^*}{\partial g_K}$ are either zero or one.

[33]For families with positive savings this effect is nil and it is positive for families that are consumption constraint. In fact, since the marginal utility of desired consumption is equal to δr^*, decreasing marginal utility implies $U_c > \delta r^*$

of ex-post repudiation, we will not solve for the political equilibrium in period 1. For our purposes it is sufficient to say that whatever be the solution of the first period political conflict the level of the intergenerational redistribution can never exceed the upper bound derived from the public debt politically viable set. However expectations of an UCB ex-post bail-out stops market discipline from operating. In this case fiscal constraints are needed in order avoid moral hazard behaviour. The point we make is that such fiscal constraints should differ among countries according to the level of debt held by foreigners.

7. Conclusion

The Stability and Growth Pact is one of the pilasters of the EMU. It constrains members' fiscal policies with definite limits on deficit spending. The fiscal constraints are founded implicitly on the belief that in a monetary union the market cannot establish fiscal discipline. What blocks the free play of market forces is the belief that in the event of a fiscal crisis the ECB would intervene and monetize the problem country's debt. In other words, the fiscal constraints reflect doubts on the credibility of the no-bail-out rule.

The problem of ECB intervention arises when the government of the fiscally exposed country elects not to honour its debt fully. Here, we examine the determinants of such a decision in a political economy framework. The main result of our model is that a debt management policy directed at lowering effective yields (repudiation) might be the dominant option for a self-interested government whose creditors consist in part of foreigners. If the debt is held only by residents, even an arbitrarily low cost of repudiation is sufficient to avert that outcome.

With the advent of EMU and the consequent end of differences in the tax treatment of governments' securities as well as of foreign exchange risk, there has been broader international diffusion of governments' paper. Thus the risk of repudiation becomes more concrete by comparison with a situation in which public debt is held only by resident investors. Within the profligate country, in fact, each individual prefers that the foreign debt be at least partially repudiated.

Insofar as repudiation jeopardizes the soundness of the banking system (given banks' exposure to government debt) or the stability of the securities' markets, it is likely that the ECB will intervene after the fact with an inflation-based or fiscal bail-out whose costs will be borne by all the countries of the Union. The Stability Pact can thus be read as an instrument for correcting the inefficiencies created by free-riding consequent to an ex-post bail-out on the part of the ECB. What our model highlights – differing in this from the rest of the literature – is that the impact of the fiscal position of the various member countries on the Monetary Union stability does not depend on the stock of debt but on the proportion of it that is held abroad.

Our results have a number of implications for the current debate on reforming EU rules and institutions. With reference to the proposal, advanced in the EEAG Report (2003), of letting the deficit ceiling depend explicitly on the country's debt level, our contribution suggests that what is really relevant is not the stock of national debt but the share of it held abroad. Similarly, with respect to Casella's (2001) proposal of substituting homogeneous deficit ceilings with tradable deficit permits, we claim that the number of permits assigned to each country should negatively depend on the foreign exposure.

References

Aghion, P. and P. Bolton, 1990, Government Domestic Debt and the Risk of Default: a Political-Economic Model of the Strategic Role of Debt, in R. Dornbush and M. Draghi, *Public Debt Management: Theory and History*; Cambridge University Press, Cambridge.

Alesina, A. and G. Tabellini, 1990, A Positive Theory of Fiscal Deficits and Government Debt in a Democracy, *Review of Economic Studies* 57 :403-14.

Arnold, I. and J. Lemmen, 2001, The Vulnerability of Banks to Government Default Risk in the EMU *International Finance* 4 :1, 101-125

Barro, R.J. and Gordon D.B. ,1983, Rules, discretion and reputation in a model of monetary policy *Journal of monetary economics* 12, 101-121

Bernheim, B.D. and M.D. Whinston, 1986, Menu auctions, resource allocation, and economic influence, *The Quarterly Journal of Economics* 101:1-31.

Beetsma, R. and L. Bovemberg, 1999, Does Monetary Unification Lead to Excessive Debt Accumulation?, *Journal of Public Economics* 74: 299-325.

Beestma, R. and H. Uhlig, 1999, An Analysis of the Stability and Growth Pact, *Economic Journal* 109: 546-71.

Beetsma, R., and L. Bovemberg 2001, Strategic Debt Accumulation in a Heterogeneous Monetary Union *mimeo*.

Beetsma, R. and L. Bovenberg 2000, Designing fiscal and monetary institutions for a European Monetary Union, *Public Choice* 102: 247-269.

Chari, V.V. and P.J. Kehoe, 1998, On the Need of Fiscal Constraints in a Monetary Union, Federal Reserve Bank of Minnesota Working Papers, 589, Minneapolis.

Casella, A. ,2001, Tradable Deficits Permits, in Brunila A., M.Buti, and D.Franco. *The Stability and Growth Pact. The Architecture of Fiscal Policy in EMU*. Palgrave, Basinstone.

Debrun, X. ,2000,Fiscal Rules in a Monetary Union: a Short-Run Analysis *Open Economies Review* 11:323-358

Di Gioacchino, D., S. Ginebri and L. Sabani, 1999, Public Debt Repudiation: Is it Really Possible in the EMU? A Political Economy Approach, *Rivista Italiana degli Economisti* 4:375-401.

Di Gioacchino, D., S. Ginebri and L. Sabani,, 2000, Bribery and Public Debt Repudiation, *Public Choice* 105: 34-51.

Di Gioacchino, D., S. Ginebri and L. Sabani, 2003, The Political Power of Debt Owners *Rivista di Politica Economica* I-II:79-115

Dixit, A. 2000, Games of monetary and fiscal interactions in the EMU *European Economic Review* 45: 589-613

Dixit, A. and J. Londregan, 2000, Political power and the credibility of government debt, *Journal of Economic Theory* 94

Drazen, A. 1998, Towards a political-economic theory of domestic debt, in Calvo G. and M. King *The debt burden and its consequences for monetary policy* MacMillan Press, London.

EEAG, 2003, Report on the European Economy, European Economic Advisory Group at CESifo, Munich.

Eichengreen, B. and C. Wyplosz, 1998, The Stability Pact: More than a Minor nuisance, in Begg.D. et al. *EMU: Prospects and Challenges for the Euro*. Blackwell, Oxford.

Giovannetti G,. R. Marimon. and P. Teles, 1997, If you do what you should not: Policy Commitments in a Delayed EMU, *mimeo* EUI, Florence.

Grossman G. and E. Helpman, 1994,"Protection for Sale" American Economic Review, vol.84,pp.833-50

Tabellini, G., 1991, The politics of intergenerational redistribution, *Journal of Political Economy* 99: 335-60.

Tabellini, G. and A. Alesina, 1990, Voting on the budget deficit *American Economic Review* 80,1 :37-49