

Sustainability & Stability as East meets EU
The Accession Candidates and the Stability and Growth Pact*

Willem H. Buiter

and

Clemens Grafe

**Preliminary and incomplete; do not cite without the
permission of the authors**

25 April 2002

* The views and opinions expressed in this paper are those of the authors alone. They do not necessarily represent the views and opinions of the European Bank for Reconstruction and Development.

Introduction

Thirteen countries are currently official candidates for accession to the European Union (EU).¹ All except Turkey are formally engaged in accession negotiations. Of the twelve candidates engaged in formal accession negotiations, as many as ten (all except Bulgaria and Romania) may become EU members as early as 2004. Eight of these early accession candidates (all except for Cyprus and Malta) are countries of operation of the European Bank for Reconstruction and Development (EBRD). Bulgaria and Romania are expected to conclude their accession negotiations and join the EU at some later date. Other countries in South Eastern Europe, including Croatia, Yugoslavia, FYR Macedonia, Bosnia-Herzegovina and Albania, while not yet involved in any official negotiation process for EU accession, are determined to become EU members as due course, and the ultimate boundaries of the EU may well extend quite far to the east.

All new EU members will automatically be bound by the rules of the Stability and Growth Pact. Also, following EU membership, none of the accession candidates will be able to obtain a derogation from membership in the Economic and Monetary Union (EMU) as the UK managed to do in 1992. EMU membership is now part of the 'acquis communautaire'. Of course, a set of conditions (the Maastricht conditions, after the Treaty of Maastricht) has to be satisfied in order for the new EU members to qualify for EMU membership.

This paper considers the implications for the successful EU accession candidates of the fiscal-financial conditions that they will have to satisfy, either as part of the EU rules of the game – the fiscal–financial conditions of the Stability and Growth Pact – or as part of the EMU membership conditions – the Maastricht conditions. These fiscal-financial criteria were designed for a much more homogeneous group of countries – the fifteen current EU members that will be contained in the EU following the coming enlargement. The existing

EU does, of course, contain quite a bit of heterogeneity in real economic structures: Greece, Portugal Spain and southern Italy are different from Finland, Germany and the UK in ways that matter for the impact of the fiscal-financial conditions of the Stability and Growth Pact and the Maastricht Treaty and Protocols on real economic performance. The likely early addition to the EU membership roll of eight EBRD countries of operation, and a-fortiori the later accession of Bulgaria and Romania and the eventual accession of the remaining South East European countries will, however, make emphatically clear that the ‘one-size-fits-all’ fiscal-financial criteria of the Stability and Growth Pact and the Maastricht Treaty are ill-designed to cope with the heterogeneous real economic structures of an enlarged EU.

We are not arguing that countries with very distinct real economic structures cannot all prosper in the European Union. They can and will prosper, provided reasonable allowance is made for the common-sense implications of marked differences in economic structure for the design of appropriate fiscal-financial rules. We are also not arguing that countries with very difference real economic structures should not be members of a common monetary union. To the contrary, we favour the earliest possible EMU membership for all successful EU applicants. As regards monetary policy, one size does indeed quite comfortably fit all. For the small, highly open accession candidates, exposed (courtesy of the ‘acquis’) to unrestricted international mobility of financial capital, exchange rate flexibility and the formal trappings of an independent national monetary policy are unnecessary and costly luxuries.

What we do say is that the appropriate operational expression of the concepts of *sustainable* and *stabilising* fiscal-financial policies must depend on certain observable and identifiable structural economic features, and that the Stability and Growth Pact and the Maastricht criteria fail to do this. In this paper we demonstrate the shortcomings of the

¹ They are: Bulgaria, the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania,

existing fiscal-financial criteria and suggest ways of amending and improving the fiscal-financial rules of the Stability and Growth Pact.

The impact of the shortcomings of the Stability and Growth Pact and the Maastricht Treaty identified here is not restricted to the accession candidates. Existing EU members too possess structural characteristics that deviate from the EU average, albeit to a lesser extent than the accession candidates. Some of these differences call for fiscal-financial rules that can reflect the relevant structural heterogeneity.

In Section I, we summarise the Stability and Growth Pact and Maastricht fiscal-financial criteria, and point out that they do not provide a framework for fiscal co-ordination in the EU (let alone a framework for fiscal and monetary co-ordination in EMU). In Section II we introduce a bare-bones accounting framework for tracking some key indicators of a country's fiscal-financial performance. In Section III we discuss some of the most important 'Type I' and 'Type II' errors (that is, errors of commission and errors of omission) in the design of the fiscal-financial criteria of the Stability and Growth Pact and the Maastricht Treaty and explain why this is of special relevance to the accession candidates. We also consider the operating characteristics of an alternative fiscal rule, the *Golden Rule*, which is part of the British budget framework.² We also suggest modifications to the criteria that would render them more likely to support sustainable and stabilising behaviour by the fiscal authorities. Section IV concludes.

I. The Fiscal-Financial Constraints of the Stability and Growth Pact and the Maastricht Treaty

Malta, Poland, Romania, the Slovak Republic, Slovenia and Turkey.

² The analysis extends that in Buiter and Kletzer [1991a], Buiter, Corsetti and Pesenti [1993] and Buiter [2001].

We consider the parts of the Pact that are operationally relevant for budgetary policy because they constraint permissible fiscal-financial rules to be, the following (our emphasis added).

“Adherence to the objective of sound budgetary positions close to balance or in surplus will allow all Member States to deal with normal cyclical fluctuations while keeping the government deficit within the reference value of 3 % of GDP.”³

Note that, with one qualification, these fiscal-financial constraints on permissible budgetary policies apply to all EU members, not just to EMU members. The Stability and Growth Pact constrains the financial deficit of the general government of every EU member in two ways. These constraints can be expressed as follows: (η is the general government financial deficit as a fraction of GDP; b is the stock of gross general government debt as a fraction of annual GDP; cyclically adjusted variables are denoted by tildes):

$$\eta \leq 0.03 \quad (1)$$

$$\tilde{\eta} \leq 0 \quad (2)$$

The criterion in (1), constraining the actual financial deficit of the general government, will be called the Maastricht deficit criterion.⁴ The criterion in (2), constraining

³ Note that the reference value of 3% of GDP for the general government financial deficit, which is inherited from the Maastricht Treaty, does not apply to the UK, unless it joins EMU. This is because the UK obtained a waiver (or derogation) of the obligation to join EMU (to proceed to the ‘third phase’ of the EMU process). The other two EU members that are not also EMU members, Denmark and Sweden, are, however, required to be able to withstand a normal cyclical downturn without breaching the 3 % of GDP deficit reference value. The reason is that, unlike the UK, they do not have a derogation from EMU membership. It is not anticipated that any of the current or future accession candidates will be able to obtain a UK-style EMU derogation. Even the UK is required to endeavour to avoid excessive deficits. The requirements of ‘close to balance or surplus in the medium term’ contained in the Stability and Growth Pact do apply to the UK (see e.g. the ‘Council Opinion of 12 February 2002, on the updated convergence programme for the United Kingdom, 2000/2001 to 2006/7’, *Official Journal of the European Communities*, 26.2 2002, C 51/7).

⁴ The three percent of GDP threshold for the general government financial deficit can be breached only in exceptional circumstances, defined as ‘severe recession’. In evaluating whether the economic downturn is severe, the Member States will, as a rule, take as a reference point an annual fall in real GDP of at least 0,75 %. If a Member State is deemed by the European Commission and the Council of Ministers to have taken inadequate measures to address a situation where the general government deficit exceeds 3 % of GDP, the Member

the cyclically corrected deficit, will be called the Stability and Growth Pact deficit criterion. For EMU candidates, but not for the existing EMU members or existing EU members with an EMU derogation, the further constraint applies as a condition for EMU membership, that the general government gross stock of debt be less than 60 percent of annual GDP.

$$b \leq 0.6 \quad (3)$$

We shall refer to the criterion in (3) as the Maastricht ‘debt ceiling’.

Table 1 provides the data for the general government financial balance-GDP ratio for the 10 EBRD countries of operation that are currently in accession negotiations. Table 2 gives the same information for the EU countries, the USA and Japan. General government gross debt –GDP ratios for the 10 CEE accession candidates are given in Table 3. Table 4 gives the same information for the EU countries, the USA and Japan. Cyclically adjusted data for general government deficits are not available for the ten CEE accession candidates.

TABLE 1 HERE

TABLE 2 HERE

TABLE 3 HERE

TABLE 4 HERE

There are some perhaps surprising features in these four Tables. From Tables 3 and 4 we see that the general government debt-to-GDP ratio is about twice as high for the existing

State may be required to make non-interest-bearing deposits. If the failure to address the excessive deficit persists, these deposits will turn into a fine. No financial penalties are imposed as long as the general government financial deficit does not exceed 3% of GDP. Neither are financial fines imposed if a country is deemed by the Commission and the Council to have pursued inappropriate policies in the context of the yearly surveillance exercise, unless of course the general government financial deficit were to exceed 3 % of GDP. Ireland was at the receiving end of such a negative assessment in 2001. The penalties for breaching the 3% limit do not apply to UK as long as it has its derogation. Upon EU accession, the current accession candidates would be subject both to the 3% limit on the actual deficit and to the penalties for breaching that limit.

EMU members as for the accession candidates. As regards the general government deficit-GDP ratios, the situation is reversed. The 8 CEB accession candidates have run general government deficits at a much higher level, as a share of GDP, than the existing EMU members. For the last 3 years, the 8 CEB countries average general government deficit has exceeded 3 percent of GDP.

II. Some Simple Budgetary Arithmetic

The fiscal-financial-monetary programme (FFMP) of the state consists of the rules governing the sequences of past, current and future exhaustive public spending (consumption and investment), tax structures and revenues (rates, exemptions, bases, allowances, deductions etc.), subsidy and transfer structures, government borrowing and monetary issuance. For our purposes, the state consists of the general government sector and the central bank.

A simplified stylised central bank has the monetary base on the liability side of its balance sheet. On the asset side it has the stock of international foreign exchange reserves and the stock of domestic credit. In what follows domestic credit is identified with central bank holdings of nominally denominated general government interest-bearing debt.⁵

For real-world applications, it is important that *all* financial assets and liabilities (that is, all contractual claims and obligations) of the general government and central bank be included or consolidated in their balance sheets and that all non-contractual expenditures and receipts also be accounted for comprehensively and fully. All off-budget (contingent) expenditures and receipts (including the commitments and revenues of the state pension funds, the social security fund etc. and all off-balance sheet contingent claims and liabilities

⁵ In many transition countries and developing countries the central bank may also hold private sector debt instruments among its assets and interest-bearing, non-monetary liabilities among its liabilities.

must be consolidated and included in the accounts. Special purpose vehicles and off-balance sheet and off-budget constructions are as detrimental to fiscal transparency and they are to transparency in the private sector.

For simplicity, we restrict the accounting framework below to a single, (very) short maturity, nominally denominated government debt instrument. Generalisations to a range of debt instruments with different maturities, currency denominations, methods for index-linking etc. are conceptually straightforward. Securitisation of future tax receipts is of course equivalent to government borrowing and should be treated as such.⁶ Guarantees, whether explicit or implicit, should included in the accounts, along with all other contingent liabilities and claims. Pricing these contingent claims is a non-trivial task when there are no deep and liquid secondary markets for them, but that cannot be a reason for ignoring them, as the imputation of a zero price is bound to be wrong most of the time. The notation to be used in the rest of the paper is summarised in Table 5.

TABLE 5 HERE

Equation (4) is the budget identity of the general government and equation (5) that of the central bank.⁷

$$\frac{\dot{B}}{PY} \equiv g - \tau + i \left(\frac{B}{PY} \right) \quad (4)$$

⁶ It is government debt with a specific stream of future tax revenues earmarked for future debt service.

⁷ Note that the familiar proposition that the change in the monetary base equals domestic credit expansion plus the value of the change in the stock of foreign exchange reserves is correct if and only if the central bank makes no *after-tax* profits, that is, its before-tax profits,

$i \frac{B^{CB}}{PY} + Ei^* \frac{R^*}{PY}$, are paid as taxes to the Treasury or Ministry of Finance:

$\dot{M} \equiv \dot{B}^{CB} + E\dot{R}^*$ iff $\tau^{CB} \equiv i \frac{B^{CB}}{PY} + Ei^* \frac{R^*}{PY}$.

$$\frac{\dot{M}}{PY} - \frac{\dot{B}^{CB}}{PY} - E \frac{\dot{R}^*}{PY} \equiv \tau^{CB} - i \frac{B^{CB}}{PY} - E i^* \frac{R^*}{PY} \quad (5)$$

Using the definitions of Table 1, equations (4) and (5) can be rewritten as

$$\dot{b} \equiv g - \tau + (r - n)b \quad (6)$$

$$-\dot{b}^{CB} - \dot{\rho}^* \equiv \tau^{CB} - (r - n)b^{CB} - (i^* + \varepsilon - \pi - n)\rho^* - \sigma \quad (7)$$

The usual solvency constraints, ruling out Ponzi finance by both the government and the central bank, imply the following intertemporal budget constraints for the general government (equation (8)) and for the central bank (equation (9)).

$$b(t) \leq \int_t^\infty e^{-\int_t^v [r(u) - n(u)] du} [\tau(v) - g(v)] dv \quad (8)$$

$$-b^{CB}(t) - \rho^*(t) \leq \int_t^\infty e^{-\int_t^v [r(u) - n(u)] du} \left(-\tau^{CB}(v) + \sigma(v) + [i^*(v) + \varepsilon(v) - i(v)] \rho^*(v) \right) dv \quad (9)$$

To apply this to EMU, the central bank has to be interpreted as the ESCB and not just the ECB, since most of the international reserves are still held at the national central banks. The general government financial deficit has to be interpreted as the sum of the national general government financial deficits of the 12 EMU member states.⁸

Summing (4) and (5) gives the budget identity of the state, that is, of the consolidated general government and central bank.

$$\dot{b} - \dot{b}^{CB} - \dot{\rho}^* \equiv g - (\tau - \tau^{CB}) - \sigma + (r - n)(b - b^{CB} - \rho^*) - (i^* + \varepsilon - i)\rho^* \quad (10)$$

The intertemporal budget constraint of the consolidated general government and central bank is

$$\begin{aligned} & b(t) - b^{CB}(t) - \rho^*(t) \\ & \leq \int_t^\infty e^{-\int_t^v [r(u) - n(u)] du} \left(\tau(v) - \tau^{CB}(v) + \sigma(v) - g(v) + [i^*(v) + \varepsilon(v) - i(v)] \rho^*(v) \right) dv \end{aligned} \quad (11)$$

⁸ The budget of the EC is too small to matter here. Also, the EC is not allowed to borrow.

It is obvious from the intertemporal budget constraint of the consolidated state, (11), that monetary and fiscal policy are bound to be ‘structurally’ interdependent. The sequences of taxes, transfer payments, subsidies, exhaustive public spending and monetary issuance cannot be set independently of each other if the intertemporal budget constraint of the state is to be satisfied as an identity.

For certain purposes, it is important to decompose total public spending into general government *transfer payments*, general government *consumption* and general government *capital formation*, that is,⁹

$$g \equiv g_T + g_C + g_I \quad (12)$$

Likewise it can be useful to decompose total current revenues into gross cash returns to the government on the public sector capital stock and other current revenues, that is:

$$\tau \equiv \tau_0 + \theta k \quad (13)$$

Noting that $\dot{k} \equiv g_I - (\delta + n)k$, we can write the general government budget identity as follows:

$$\dot{b} - \dot{k} \equiv g_C + g_T - \tau_0 + (r - n)(b - k) - (\theta - \delta - r)k \quad (14)$$

The Maastricht deficit criterion and the Stability and Growth Pact deficit criterion can be written as follows:

$$\eta \equiv \frac{\dot{B}}{PY} \equiv g - \tau + ib \leq 0.03 \quad (15)$$

$$\tilde{\eta} \equiv \tilde{g} - \tilde{\tau} + ib \leq 0 \quad (16)$$

III. What the Stability and Growth Pact Criteria Do and Don’t Do

⁹ Public sector transfer payments include all subsidies and social security (or national insurance) benefit payments, including state pension, health and disability benefits. Social security (or national insurance) taxes or contributions are included among the taxes in the accounts.

III.1 The Co-ordination of national fiscal stabilisation policies

There have been some attempts to deal with fiscal incentives-related issues at the level of the EU as a whole, but there has so far not been any attempt to co-ordinate the fiscal stabilisation policies of the 15 EU members or of the 12 EMU members. *A fortiori* there has not been any attempt to co-ordinate monetary and fiscal policy in EMU. There exists no institutional mechanism or policy framework today in the EU (or in the EMU) for co-ordinating national fiscal stabilisation policies, let alone for jointly co-ordinating the 12 national fiscal stabilisation policies with the EMU-wide monetary policy determined by the ECB. What exists are (1) The Maastricht Treaty with its numerical constraints on the general government debt and deficit, which must be met for an EU member to be eligible for EMU membership; (2) the Stability and Growth Pact, with its numerical criteria and potential financial penalties; and (3) the non-binding EU surveillance procedures.

The material on the EU's 'Economic Policy Coordination' website¹⁰ under the headings 'Broad Economic Policy Guidelines' and 'Stability and Convergence Programmes', as well as the material on other aspects of EU-wide 'surveillance' does not address policy co-ordination at the level of the E(M)U area as a whole.¹¹

The budgetary norms and performance criteria of the Stability and Growth Pact apply to each EMU member country separately without reference either to the performance of the individual other EMU members or to EMU-wide economic indicators. The Stability and Convergence Programmes and the recommendations they contain are strictly one-country-at-a-time. The country-specific budgetary recommendations are not made contingent on, or related to, EMU area-wide developments or on the budgetary policy actions of individual

¹⁰ <http://ue.eu.int/emu/en/index.htm>.

¹¹ See Appendix 1 for the text of the '*Resolution of the European Council on the Stability and Growth Pact*'

other EMU countries. Nor is any attention paid to whether the whole set of national fiscal recommendations are congruous with the monetary policy rule implemented by the ECB.

The Commission-run monitoring and surveillance process that takes place to ascertain that the recommendation of the Stability and Convergence Programmes are followed up, is also implemented on a country-by-country basis, without any explicit reference to whether the sum of the national parts makes sense for the whole region.

III.2 The choice of the *general government* sector as the subject of deficit and debt constraints

The debt and deficit criteria of the Maastricht Treaty and the Stability and Growth Pact constrain the debt and deficit of the *general* government sector. This includes central or federal, provincial and local governments, as well as such ‘special purpose vehicles’ (often off-budget and off-balance sheet) as the social security retirement, health and disability funds, commodity stabilisation funds etc.

The central bank, however, is not included in the general government sector whose financial deficits and debt are constrained by the Maastricht Treaty and the Stability and Growth Pact. In subsequent sections, we will focus exclusively on the sustainability and stability of the general government’s fiscal-financial programme, rather than on the fiscal-financial-monetary programme of the consolidated general government and central bank. Although the way the Stability and Growth Pact and Maastricht criteria are formulated compels this choice, the price we pay is that we risk losing sight of the unique role and significance of the monetary liabilities of the state, which happen to be on the balance sheet of the central bank rather than of the general government.

The macroeconomic implications of general government debt issuance depends on whether the debt is purchased by the general public (including the rest of the world) or by the central bank. By issuing fiat base money, the state, through its agent the central bank,

borrowes at a zero nominal interest rate, using liabilities that will never have to be redeemed. These monetary liabilities of the state have a unique significance in the determination of the general price level. All this is lost sight of when we consider just the general government sector. For a fully satisfactory analysis one always ought to ‘back out’ the monetary implications of alternative fiscal-financial policies, by considering the behaviour of the consolidated general government and central bank.

Our view that the consolidated general government sector and central bank provides the appropriate ‘unit’ (that is, level of aggregation and consolidation) for the assessment of the fiscal-financial sustainability and stabilisation issues faced by the sovereign, has no bearing whatsoever the issue of whether the central bank should be independent. We are in favour of operational independence for the central bank. When monetary policy is institutionally separated from and operationally independent of the rest of the state, it makes sense, for certain purposes, to distinguish between the general government and the central bank and to draw of separate accounts for the two entities.¹²

The necessity for consolidating the central bank and the general government in order to assess the financial sustainability of the sovereign is underlined by the universal practice that the operating profits of the central bank are automatically transferred to the Treasury. Indeed this assumption must have been made if the familiar ‘identity’ that the change in the base money stock equals domestic credit expansion by the central bank plus the value of the

¹² However, a central bank’s *legal or constitutional independence*, that is, either its *operational independence* (no-one can tell the central bank what to do), or its combined *operational and target independence* (no-one can tell the central bank what to do and the central bank sets its own objectives) has no bearing on its *structural independence*. The central bank is structurally independent if its ‘payoff function’ (directly or through the constraints it faces in the pursuit of its objective(s)) is not affected by the actions of other agents, and specifically, is not affected by the actions of the fiscal authorities. When there is structural dependence, *individually rational* monetary policy making requires the central bank to take into account the past, current and prospective future actions of the fiscal authorities. *Socially efficient* monetary policy making requires the central bank and the fiscal authorities to act co-operatively.

net increases in the central bank's stock of gold and foreign exchange reserves, is indeed to hold as an identity.¹³ In addition, the solvency of the central bank is ultimately guaranteed by the deep pockets of the Ministry of Finance, through its power to tax. It is the Treasury (Ministry of Finance) that ultimately assumes the liabilities of the central bank, and will recapitalise a central bank whose net worth has become negative for whatever reason, by transferring general government securities to the balance sheet of the central bank.

Consider the case of Russia, one of the EBRD's countries of operation that is not a current or imminent accession candidate. The Russian state, during the years 2000-2001, decided to accumulate a large part of its growing net foreign assets in the form of foreign exchange reserves at the Central Bank of Russia. It is legalistic and naive to view these reserves as in any meaningful sense the property of the central bank, rather than the property of the state, parked for reasons of obvious administrative convenience with a state agency known as the central bank rather than with the Motor Vehicle Department.

Anyone who has worked in developing countries or transition economies will have become aware of the ease with which a financial deficit of the state can be shifted from the (transparent) financial deficit of the general government to the (opaque) quasi-fiscal deficit of the central bank. Central Bank independence provides a partial but not a complete and fire-proof guarantee against such financial window dressing.¹⁴ It is only partial, because the formal trappings of central bank independence need not bear any relationship to the substance of independent decision making by the central bank. Even during 2001-2002, central bank independence has been challenged in at least two of the advanced accession candidates in central Europe.

¹³ See footnote 7.

¹⁴ During the 'qualifying period' for the original launch of the EMU by eleven countries on January 1, 1999, the German Government attempted a quasi-fiscal legerdemain, through a proposal for crediting it with some revaluation gains on the gold reserves of the Bundesbank. The Bundesbank resisted this successfully.

III.3 A blunt instrument for correcting a bias towards excessive deficits

Rather than providing a framework for co-ordinating fiscal stabilisation policies among E(M)U members, the Maastricht fiscal-financial criteria and the Stability and Growth Pact are concerned with the prevention of excessive public sector debt and deficits among its members, taken one at a time. The *asymmetry* of the fiscal-financial criteria is striking: deficits can be too large but no too small; surpluses cannot be too large; for countries trying to qualify for EMU, debt can be too high but not too low. This asymmetry appears to be motivated not so much by a technical economic judgement about asymmetries in the transmission mechanism, such as asymmetric spill-overs or externalities of national debt issuance. Instead it appears to reflect a political-economic judgement about a bias towards excessive public debt and deficits in E(MU) countries' budgetary institutions and political processes.

Without such a bias in the fiscal policy process or without some key asymmetries in the externalities of associated with public debt and deficits, one would have expected to see floors as well as ceilings on government deficits and debts.¹⁵

The political economy case for a bias towards excessive deficits is by no means overwhelming, either as theory or as empirics. Much of the theoretical work cited in support is actually about a bias towards an excessive size of government, that is, about a bias towards excessive government spending and revenues, rather than about a bias towards excessive deficits, that is, an intertemporal bias towards postponing tax increases or expenditure cuts.

Even if we consider just the post-World War II period, we see, for instance, that in the UK, the government debt - GDP ratio came down steadily (without the assistance of

¹⁵ There is an asymmetry in the transmission mechanism of debt, due to the asymmetry of default and bankruptcy. There are no special consequences attached to being 'super-solvent, the way there are to being insolvent.

externally imposed debt or deficit ceilings) from its immediate post-war high of almost 300% of annual GDP, throughout the fifties, sixties and seventies. Following a brief hiccup in the eighties, the UK debt-GDP ratio has resumed its steady downward path since the early nineties. It now stands at around 42% of annual GDP. Virtually all of this decline occurred without the benefit of externally imposed debt or deficit ceilings.

Excessive is a broader concept than unsustainable. Debt and deficits can be excessive, that is, impose greater costs than benefits, without creating a serious risk of sovereign debt default. However, debt sustainability (or long-run feasibility) is a necessary condition for debt not to be excessive (or larger than optimal).

The fiscal-financial constraints of the Stability and Growth Pact and the Maastricht Treaty are best viewed as externally (and exogenously) imposed constraints aimed at preventing each individual member country from ending up on an unsustainable, explosive path of public sector debt and deficits. If adhered to, this aim is likely to be met. However, debt and deficit ceilings that are the same for all countries, regardless of their economic structures and circumstances are unnecessarily blunt instruments even for addressing the issue of sovereign insolvency or default, let alone more subtle notions of excessiveness of government debt and deficits.

We define sustainability of a government fiscal financial programme as the absence of default risk. A fiscal-financial programme is sustainable if it ensures the solvency of the government. Consider again the fundamental solvency constraint of the government from (5), reproduced as equation (17) below.

$$\begin{aligned}
 b(t) &\leq \int_t^{\infty} e^{-\int_t^v [r(u)-n(u)]du} s(v)dv \\
 &\equiv \int_t^{\infty} e^{-\int_t^v [r(u)-n(u)]du} [\tau(v) - g(v)]dv \\
 &\equiv \int_t^{\infty} e^{-\int_t^v [r(u)-n(u)]du} [\tau_0(v) + \theta(v)k(v) - g_T(v) - g_C(v) - g_I(v)]dv
 \end{aligned} \tag{17}$$

We define the *permanent* primary surplus/GDP ratio s^p as that constant primary surplus/GDP ratio whose present discounted value, summed over all future horizons, is the same as the present discounted value of the actual future sequence of primary surplus/GDP ratios, that is,

$$s^p \equiv \left(\int_t^\infty e^{-\int_t^v [r(u)-n(u)]du} dv \right)^{-1} \int_t^\infty e^{-\int_t^v [r(u)-n(u)]du} s(v) dv \quad (18)$$

Permanent values of all other flows of expenditure or receipt ratios are defined analogously. The term $\int_t^\infty e^{-\int_t^v [r(u)-n(u)]du} dv$ can be interpreted as the value of a real (that is, index-linked) perpetuity whose (real) coupon grows at a proportional rate n . We can then define the *permanent* (or *long-run*) real interest rate minus the *permanent* (or *long-run*) real growth rate, $r^p - n^p$, as that constant value of the excess of the real interest rate over the real growth rate that generates the same value of the real perpetuity as is generated using the actual future values of $r - n$. Using (19):¹⁶

$$\left(\int_t^\infty e^{-\int_t^v (r^p - n^p) du} dv \right) \equiv \left(\int_t^\infty e^{-\int_t^v [r(u)-n(u)] du} dv \right) \quad (19)$$

it then follows that

$$r^p - n^p \equiv \left(\int_t^\infty e^{-\int_t^v [r(u)-n(u)] du} dv \right)^{-1} \quad (20)$$

The government's intertemporal budget constraint or solvency constraint can therefore be written compactly as follows:

$$b \leq \frac{s^p}{r^p - n^p} \equiv \frac{\tau^p - g^p}{r^p - n^p} \equiv \frac{\tau_0^p + \theta^p k^p - g_r^p - g_C^p - g_I^p}{r^p - n^p} \quad (21)$$

¹⁶ We require $\bar{r} - \bar{n} > 0$.

Government solvency can therefore be seen to depend on four crucial parameters: b , the outstanding debt-to-GDP-ratio; s^p , the permanent primary surplus-to-GDP-ratio; r^p , the long-run real interest rate; and n^p , the long-run real growth rate. Two of these, the long-run real interest rate and the long-run real growth rate are, at most, only partly, indirectly and highly imperfectly controllable by the government. One, the initial government debt-to-GDP-ratio, is predetermined, that is given at any point in time, but endogenous in the long run. One, the primary surplus-to-GDP-ratio, is in principle controllable by the government. This control is imperfect and subject to important constraints, administrative and political as well as economic.

Of the four crucial parameters governing government solvency, three do not get any mention in the Stability and Growth Pact deficit criterion, the Maastricht deficit criterion or the debt criterion. These are the primary surplus-to-GDP-ratio, the long-run real interest rate and the long-run real growth rate. The fourth, the debt-to-GDP-ratio, almost makes it into the debt criterion. The debt-GDP ratio of the solvency constraint is, however, a *net* debt-to-GDP-ratio. For reasons that are hard to fathom, the Maastricht debt criterion involves the *gross* debt-to-GDP-ratio. In what follows we shall assume that gross and net government debt coincide.¹⁷

Note that:

$$\begin{aligned}\dot{b} &\equiv \eta - (\pi + n)b \\ &\equiv -s + (r - n)b\end{aligned}\tag{22}$$

The first line of equation (22) states that the change in the general government debt-GDP ratio equals the general government financial deficit as a fraction of GDP, minus the reduction in the debt-GDP ratio due to nominal GDP growth. The second line of equation

¹⁷ In practice, governments with the same *net* financial asset position but different *gross* financial assets and liabilities would be impacted asymmetrically by the debt criterion. This makes little economic sense.

(22) states that the change in the general government debt-GDP ratio equals the primary deficit-to-GDP ratio plus the outstanding debt-to-GDP ratio times the excess of the real interest rate over the real growth rate.

Consider the first line of (22). The general government financial deficit-to-GDP ratio is constrained by the Stability and Growth Pact deficit criterion and the Maastricht deficit criterion. Comparing the behaviour of two national economies with the same outstanding debt-to-GDP ratio and subject to the same binding deficit constraint¹⁸, the debt-GDP ratio of the country with the higher growth rate of nominal GDP will be falling faster. A faster decline in the general government debt-GDP ratio is likely to reflect a tighter, more restrictive stance of fiscal policy. Below we consider whether, *cet. par.*, a higher rate of nominal income growth justifies a tighter fiscal policy stance and whether the answer depends on whether the higher nominal income growth reflects higher inflation or higher real output growth.

The proportional growth rate of nominal GDP is $\pi + n$. As long as the growth rate of nominal GDP is positive, the public debt process will be non-explosive as long as the deficit-to-GDP-ratio remains bounded. If the Maastricht deficit criterion is always observed and the Stability and Growth Pact deficit criterion is observed ‘on average’ – a loose but plausible interpretation of the condition that the cyclical or structural budget be close to balance or in surplus – the first line of equation shows that the debt-GDP ratio will, on average, decline and, in due course, will become zero or negative. For any given value of $r^p - n^p$ it therefore follows from equation (21), that the primary surplus-to-GDP-ratio required to ensure government solvency will fall steadily and will ultimately become zero or even negative (a primary deficit is consistent with government solvency if the government is a net creditor). This suggests that, if the Maastricht and Stability and Growth Pact deficit criteria are

observed consistently, the real burden of ensuring government solvency (measured by the permanent primary surplus-to-GDP-ratio) will decline steadily. This makes it likely, although not certain, that adherence to the Maastricht and Stability and Growth Pact deficit criteria will ensure government solvency.

Persistent nominal GDP growth differentials among E(M)U members.

There are likely to be persistent and significant differences among E(M)U members in the growth rates of real GDP and in the rates of inflation. These differences are likely to become even larger when 10 or so accession candidates join the EU, possibly as early as January 2004.

Real GDP growth differentials among E(M)U members

The eight likely early EU accession candidates are all still very much in a catching-up phase. Table 6 shows that per capita income and per capita productivity levels in the five most advanced East and Central European early accession candidates (the Czech Republic, Estonia, Hungary, Poland and Slovenia, were, in 1997, between one third (in the case of Poland) and two thirds (in the case of Slovenia) of the existing EU average when PPP measured of real GDP are used. The per capita output gaps between the most advanced current accession candidates and the current EU average are even larger when current exchange rates are used. They are also larger than the gaps, in 1986 between the per capita output levels in Greece, Portugal, Ireland and Spain, and the 1986 EU average.

TABLE 6 HERE

¹⁸ Either the Stability and Growth Pact constraint or the Maastricht constraint.

Following accession, there is likely to be a convergence process, taking many decades, during which real GDP growth in these East and Central European countries systematically exceeds that in the rest of the EU. This difference could easily amount to 2 or 3 percentage points per annum for many years. For instance, if Slovenia were to catch up to the current EU average in 25 years, its annual real growth rate for these 25 years would have to be 1.74% higher than the growth rate of the current EU average.¹⁹ For Poland, the annual growth rate differential would have to be 4.29% if catch-up is to occur in 25 years. If catch-up takes 50 years, the annual growth rate differential would come down to 2.12%. Aggregate productivity growth differentials are likely to be similar to aggregate output growth differentials, because the demographics of the existing E(M)U members is rather similar to that of the eight likely early accession candidates from Central and Eastern Europe. Both regions have graying populations and (in the absence of large-scale migration) stationary or declining populations in the medium term.

Real exchange rate appreciation

Because of the Balassa-Samuelson effect (see Balassa [1964], Samuelson [1964, 1994], Heston, Nuxoll and Summers [1994]), the relative price of non-traded goods is likely to be rising faster in the accession countries than in the current EU members. At a fixed exchange rate, this means that the inflation rate in the accession countries is likely to exceed that in the existing EU members.²⁰ This difference could, for several decades, easily amount

¹⁹ We assume for simplicity that the growth rate differential is constant during the catching up period.

²⁰ The accession countries could, following EU accession, choose to let their currencies appreciate vis-B-vis the currencies of the existing EU members. Elsewhere we have argued (see Buiter and Grafe [2002], that it is optimal for the accession candidates to join EMU as soon as possible after joining the EU. Microeconomic efficiency arguments, portfolio diversification arguments and macroeconomic stability arguments all point to the superiority of early full monetary union. In any case, two of the current crop of early accession

to 1.5 to 2 percent per annum. The Balassa-Samuelson effect follows from the assumption that productivity growth differentials among the traded and non-traded sectors are likely to be larger in poorer countries (like the accession candidates) than in richer countries (like the current EU members).

Let π_T^A denote the inflation rate of traded goods prices in the accession country, π_T^E the inflation rate of traded goods prices in Euroland and ε the proportional rate of depreciation of the accession country's currency vis-à-vis the Euro. Assume that the law of one price holds for traded goods, that is, the forces of international trade arbitrage equalise the prices of traded goods and services (expressed in a common currency) between Euroland and the accession candidate. Then

$$\pi_T^A = \pi_T^E + \varepsilon \quad (23)$$

The overall inflation rate is the inflation rate of a broad-based consumer or producer price index, which includes both traded and non-traded goods. For present purposes we take it to be the GDP deflator.²¹ Let π^A and π_N^A be the aggregate GDP inflation rate, respectively the non-traded GDP inflation rate, in the accession country and π^E and π_N^E the corresponding inflation rates in the E(M)U. The share of non-traded goods in GDP is α both in the accession country and in Euroland. It follows that

$$\pi^i = \alpha\pi_N^i + (1-\alpha)\pi_T^i \quad i = A, E \quad (24)$$

The prices of both types of goods are determined as constant proportional mark-ups on unit labour costs. Assume the growth rate of wages within a country is the same for both sectors and that the proportional mark-up on unit labour costs is constant. The growth rate of

candidates, Estonia and Lithuania, already have currency boards with the euro. It would make no sense to replace this with a looser peg prior to EMU membership.

²¹ The argument can easily be rephrased in terms of inflation differentials between national CPI indices.

money wages in country i is w^i and the sectoral productivity growth rates are denoted g_N^i and g_T^i , $i = A, E$. It follows that

$$\pi^A - \pi^E = \varepsilon + \alpha \left[(g_T^A - g_N^A) - (g_T^E - g_N^E) \right] \quad (25)$$

Thus, under reasonable assumptions, the difference between the aggregate inflation rates in an accession country and in the E(M)U equals the proportional rate of depreciation of the nominal exchange rate plus the (common) share of nontraded goods in GDP, multiplied by the excess of the productivity growth differential between the traded and non-traded goods sectors in the accession country over that same sectoral productivity growth differential in the E(M)U. It seems likely that the differential between productivity growth in the traded goods sector and productivity growth in the non-traded goods sector is larger in the candidate accession country than in the E(M)U, because productivity catch-up is likely to be faster in the traded goods sector than in the sheltered sector. This means that the relative price of non-traded goods to traded goods will be rising faster in the accession candidate than in the E(M)U. This in turn implies that, at a given exchange rate, the overall inflation rate will be higher in the accession candidate than in Euroland.

Table 6 is consistent with this presentation. In our discussion of aggregate GDP growth differentials, we already pointed to the sizeable gap in real per capita income, and therefore also in aggregate labour productivity, between the accession countries and the existing Euroland members. Aggregate productivity catch-up is therefore possible and, in our view, likely. Second, the real per capita GDP gap is much larger at market exchange rates than at PPP exchange rates. Average real per capita income of the five most advanced Central and East European accession candidates is 21% of the Euroland level at market exchange rates and 48% at PPP exchange rates. This reflects the fact that the relative price of non-traded goods to traded goods is much lower in the accession countries than in Euroland, reflecting a larger differential between the traded sector productivity levels of Euroland and

the accession countries than between the non-traded sector productivity levels. If there is gradual catch-up between the accession countries and Euroland on a sector-by-sector bases, the relative price of non-traded goods will rise in the accession countries, since their productivity growth differential between the traded goods sector and the non-traded sectors can be expected to be larger than the corresponding Euroland productivity growth differential.

Several authors have recently estimated the empirical magnitude of the impact of the Balassa-Samuelson effect on the real appreciation of accession countries. De Broek and Slok [2001] estimate in a panel regression that a one percentage point increase in the relative productivity levels in industry in accession countries compared to the EMU area increases the real exchange by 0.4%. Given this point estimate, they find that the catch-up of productivity in accession countries causes a real appreciation of around 1.5% per annum on average for all the accession countries. Given the dispersion of productivity growth differentials across countries, the effect is significantly stronger for some countries. Jakab and Kovacs [1999] estimate the effect on Hungarian data and find about 1.9% per year for Hungary. Rother [2000], analysing Slovenian data, puts the effect at 2.5% per year. All these estimates have the obvious shortcoming that they are done on very short data sets, that do not allow the authors to filter out some of the cyclical factors. Nevertheless, estimates of the impact of the Balassa-Samuelson effect on the real appreciation of the Eastern European currencies against the EMU appear to be in the range of 1.5% to 2.5% per annum. Thus, at constant exchange rates, this appreciation would raise annual inflation rates in accession countries by 1.5% to 2.5% compared to the EMU average.

While we have restricted our attention so far to the Balassa- Samuelson effect as the driving force behind an equilibrium real appreciation of the currencies, the economic literature points out several other channels that can give rise to a real appreciation during

times of economic catch up. For instance, under the reasonable assumption that the tradable sector is more capital-intensive than the nontradable sector, it is easy to show that a reduction in the difference in the cost of capital in transition countries compared to existing EMU countries will give rise to a real appreciation.

For simplicity assume that capital is only used in the tradable sector. A decrease in the cost of capital in the transition country leads, *ceteris paribus*, to an increase in the capital labour ratio and to an increase in the marginal product of labour in the tradable sector. This in turn raises wages in the tradable sector. Labour mobility across sectors implies that wages in the nontradable sectors will have to rise as well. Companies in the nontradable sector will only be able to pay these higher wages if the relative price of nontradables compared to tradables rises.

Given these other channels, it is no surprise that Pelkmanns et al. [2000] find a larger equilibrium real appreciation for accession countries, when they base their estimation on relative price levels in accession countries compared to existing EMU member countries rather than on productivity growth differentials. They estimate the annual equilibrium real appreciation to be around 3.5 to 4%.

Nominal income growth in the early accession countries could therefore, for several decades, exceed that in the existing EU members by as much as 3.5 to 5 percent per annum. For any given government debt-GDP ratio, a higher growth rate of nominal income suggests that a higher government deficit-GDP ratio is sustainable. Conversely, for any government deficit-GDP ratio, a higher growth rate of nominal income suggests that a higher government debt-GDP ratio is sustainable. Yet neither the deficit ceilings nor the debt ceiling allow for such obvious, persistent structural differences.

Rather than focusing on the government financial deficit-GDP ratio, which is uninformative from the point of view of government solvency and debt sustainability, we

should approach the fiscal sustainability issue using the fundamental determinants of government solvency, the debt-GDP ratio, the primary surplus-GDP ratio, the real interest rate and the real growth rate.

Consider the case where the future flows of primary surpluses as a fraction of GDP, summarised in the permanent primary surplus-GDP ratio, s^p , are the same for all current and future EU countries. In that case, countries with a higher real long-run growth rate, n^p , and/or a lower risk-free long-run real interest rate, r^p , will be able to support a higher debt-to-GDP ratio. Following EU accession, the present accession candidates may well have, for an extended period of time, lower risk-free real interest rates (as well as higher real growth rates) than the average of the current EU members. With full financial integration, risk-free nominal interest rates are equalised. Countries with a higher inflation rate (e.g. countries with currencies pegged to the euro and subject to the Balassa-Samuelson effect) will therefore have lower real interest rates. We have argued that it is likely that, for many years to come, the (cyclically corrected) real growth rates of the accession candidates are likely to exceed those of most current EU members and that, at a common exchange rate, the risk-free real rate of interest is likely to be lower in the accession candidates than the current E(M)U average. This would imply that any debt threshold (such as (3)) could be higher for the accession countries than for the existing E(M)U members without this compromising fiscal sustainability.

This conclusion could be reversed if the maintained assumption of the thought experiment in the last paragraph – that existing EU members and current accession candidates do not differ in their ability and willingness to run primary surpluses following accession – is not justified. It could be that the ability to run primary surpluses (as a share of GDP) is more limited, for an extended period of time, in the accession candidates than in the existing E(M)U members. Given the demands that will be put in the coming years on the

budgets of the accession candidates by their obligation to meet the ‘Acquis Communautaire’ requirements (especially in the environmental and infrastructure fields), it seems quite likely that their ability to run future primary surpluses will be impaired at least for a couple of decades to come. *Cet. par.* this would lower the safe debt-GDP threshold of these countries.

Thus, if accession candidates have either a lower long-run real interest rate or a higher long-run real growth rate²², they can either, for any given permanent primary surplus GDP ratio, s^p , safely support a higher debt-GDP ratio, b , or, for any give debt-GDP ratio, safely run a smaller permanent primary surplus-GPD ratio.

Since $\eta = -s + ib$, and since the risk-free nominal interest rate will be equalised among EMU members and among EMU members and those non-EMU members that have a credible fixed exchange rate vis-à-vis the euro, those countries with a higher long-run real growth rate and/or a lower long-run real interest rate, can safely run higher government financial deficits (as a share of GDP). Of course, the magnitude of increase in the financial deficit-GDP ratio that can be tolerated is limited, and determined by the magnitude of the difference between $r^p - n^p$ for the accession candidates and for the existing EU members, and by the level of the common short nominal rate of interest.

Thus, starting from the ‘fundamentals’ of primary surpluses, real interest rates and real growth rates, quite simple implications can be drawn as regards appropriate differences between national debt-GDP and deficit-GDP ceilings. The Pact, however, does not start from the fundamentals of *real* interest rates, *real* growth rates, *real* public spending shares of GDP and *real* current revenue shares in GDP. Both the Maastricht deficit criterion and the Stability and Growth Pact deficit criterion involve uniform deficit-to-GDP ceilings across countries. Valuable, verifiable information essential for an accurate assessment of public debt sustainability is ignored.

²² That is, a lower (but still positive) value of $r^p - n^p$

III.4 The long-run implications of the Stability and Growth Pact

An obvious but nevertheless startling implication of adherence to the Stability and Growth Pact is that it will cause the eventual amortisation of all government debt and the emergence of creditor governments in all EU countries.

The Stability and Growth Pact and the numerical criteria it contains have no expiration date. They are meant to apply for all time. According to the Stability and Growth Pact deficit criterion, the cyclically corrected budget has to be close to balance or in surplus. We assume that close to balance or in surplus means, in the long run, that the public sector financial deficit is non-positive: $\bar{\eta} \leq 0$. This means that the long-run stock of government debt is either zero or negative.

$$\bar{b} \equiv \frac{\bar{\eta}}{\bar{\pi} + \bar{n}} \leq 0 \text{ if } \bar{\eta} \leq 0 \text{ and } \bar{\pi} + \bar{n} > 0 \quad (26)$$

Simple arithmetic suffices to make the point that one inescapable long-run implication of the Stability and Growth Pact is that every government will, eventually, either have zero net financial debt or become a net financial creditor.

There are neoclassical theories of optimal taxation in a world where only distortionary taxes exist that imply that the steady-state tax rate on capital income is zero (see Chamley [1981, 1986] and Lucas [1988]). If labour income is viewed as mainly the return to augmentable human capital, the optimal labour income tax rate would also be zero in steady state. If distortionary capital taxes are the only taxes (i.e. there is no consumption tax), all steady-state tax rates will be zero. If public spending is positive, this means that the steady-state net stock of government debt is negative. The government is a long-run net creditor.

Since $\bar{b} = \frac{\bar{\tau} - \bar{g}}{\bar{r} - \bar{n}}$, when all tax (and subsidy) rates are zero, $\bar{\tau} = 0$ and

$$\bar{b} = \frac{-\bar{g}}{\bar{r} - \bar{n}} < 0 \text{ if } \bar{r} > \bar{n} \text{ and } \bar{g} > 0 \quad (27)$$

In steady state all public spending is financed out of the government's earnings on its portfolio of financial assets. Distortionary capital taxes are not used. Even as theory, this result is not robust. It depends crucially on the equalisation, in the long run, of the after-tax marginal product of capital and the exogenous pure rate of time preference, common to households and the tax authority. In the very short run (at a point in time) the capital stock is predetermined and has zero supply elasticity. In the long run, the stock of capital takes on whatever value is required to equate its after-tax marginal product of capital to the constant pure rate of time preference of the households and the tax authority. Speaking loosely, the steady-state supply elasticity of capital is infinite. It is therefore optimal not to tax (or subsidise) capital in steady state.

This very tight connection between the steady-state capital stock, the capital income tax rate and the constant pure rate of time preference is a feature only of representative agent models with infinite-lived agents and a constant pure rate of time preference. It does not hold in overlapping generations models, for example. In overlapping generations models with distortionary taxes and transfer payments, public debt can be an effective instrument for intergenerational distribution and insurance. The optimal long-run stock of debt is not zero or negative in these more realistic models. Even in the representative agent models, steady-state tax rates on private consumption and (if not all labour income represents the return on the accumulation of human capital) on labour income are non-zero in general. The optimal steady-state stock of public debt could therefore be positive.

A more practical problem with the conclusion that the long-run tax rates on the income from augmentable asset stocks are zero is that it assumes that the government can commit itself to a policy of very high capital taxation rates in the short run (ideally a capital levy on all reproducible assets), in order to set itself up for a long run without capital

taxation. At any given point of time, the fiscal authorities are in a short run, with a predetermined stock of capital, begging to be subjected to confiscatory capital taxation. Chamley's optimal fiscal policy is therefore unlikely to be time-consistent.

Finally, there are problems with the compatibility of a private market economy with a government that is a large net creditor. The European Bank for Reconstruction and Development is frequently engaged in policies aimed at getting the government out of the business of lending to the private sector, an activity for which civil servants are neither well-qualified nor appropriately motivated. Instead of becoming a lender to the private sector, the government could become the owner of part of the capital stock. If the government did not want to get into the stock-picking business, it could buy a share of the 'market portfolio', that is a common fraction all shares outstanding. Whether a share-holder government would be willing and able to leave the management of the capital stock to the private sector is questionable. A way would have to be found either to restrict the government to owning non-voting shares only, or to make sure that the government is a passive portfolio investor who does not try to influence management or board of directors rather than an active strategic investor. It is ironic that the Stability and Growth Pact and the neoclassical theory of optimal taxation may have as one of their implications the (partial) socialisation of the means of production in the long run.

III.5 The Stability and Growth Pact and procyclical stabilisation policy

The Stability and Growth Pact criteria can interfere with national fiscal stabilisation policy. If the constraints of the Pact are binding on a national fiscal authority, it is not possible to let the automatic fiscal stabilisers operate as they should if there is an unexpected

downturn in economic activity. Fiscal policy could be forced to become pro-cyclical in the downturn, with tax rates rising and spending programmes being cut during the downswing.²³

Of course, a country can reduce the likelihood of the Stability and Growth Pact deficit limits becoming binding by positioning itself in such a way that, over the cycle, it runs such a small deficit (or such a large surplus) that the likelihood of hitting the deficit ceiling becomes arbitrarily low. The automatic stabilisers could then operate freely, even during a downturn. The point is correct, but the proposed remedy has two weaknesses, one related to the short-run costs of getting there from here, and the other related to the long-run implications of such a policy.

As regards the short-run problem, most E(M)U countries still have cyclically adjusted general government deficits. To get to a position of cyclically corrected budget surpluses large enough to eliminate (or minimise) the risk of hitting the deficit limits during a downturn, would involve a process of fiscal tightening, which would be costly.

As regards the long-run problem, the implication of a government budget that is sufficiently in surplus over the cycle to never risk hitting the deficit ceilings is a seriously negative steady-state government debt position. We discussed some of the drawbacks of creditor governments in the previous sub section.

III.6 The Stability and Growth Pact and optimal tax smoothing

Some of the neoclassical theories of the optimal use of distortionary taxes imply that, faced with temporary variations in public spending or in the tax base, public sector deficits

²³ For completeness, we point out here that we know of no model of the economy – old Keynesian, new Keynesian, old monetarist or new monetarist, old Classical or new Classical - for with either the *level* of the general government financial deficit (as a fraction of GDP), or its *change*, is an appropriate measure of the impact of the budget on aggregate demand. The same holds for the cyclically corrected or structural deficit (level or change), for the primary deficit (level or change) or even for the public debt-GDP ratio (level or change).

and surpluses should be used to smooth distortionary taxes over time and thus to minimize the excess burden of distortionary taxes (see e.g. Barro [1979]). Arbitrary constraints on the size of permissible budget deficits will be welfare-decreasing when they become binding. This criticism is the neo-classical version of the previous neo-Keynesian argument in favour of counter-cyclical government deficits. It reinforces the conclusion of the previous subsection that deficit norms should distinguish between temporary or transitory and permanent or persistent changes in spending and revenues. Cyclical variations in deficits due to the operation of the automatic fiscal stabilisers are just one example of temporary variations in revenues and spending.

III.7 The Stability and Growth Pact and a bias against public sector investment

The Stability and Growth Pact criteria do not allow for differences between current spending and general government capital formation. In the UK, one of the principles governing the fiscal-financial programme is the ‘cyclically corrected golden rule’. On a cyclically corrected basis, government borrowing should not exceed government capital formation. From the government’s budget identity it follows that

$$\dot{b} \equiv (g_C + g_T + \delta k - \tau_0 - \theta k + ib) + g_I - \delta k - (\pi + n)b \quad (28)$$

The *cyclically corrected golden rule* is:²⁴

$$\tilde{g}_C + \tilde{g}_T + \delta k - \tilde{\tau}_0 - \tilde{\theta}k + ib \leq 0 \quad (29)$$

It therefore follows that cyclically corrected government borrowing is constrained as follows:

$$\tilde{b} \leq \tilde{g}_I - \delta k - (\pi + \tilde{n})b \quad (30)$$

that is,

²⁴ We assume that depreciation, that is, capital consumption, is counted as current expenditure.

$$\tilde{\eta} \leq \tilde{g}_I - \delta k \quad (31)$$

There are two things that are obviously undesirable about this rule. First, the nominal amount that can be borrowed for investment is independent of the rate of inflation. Inflation (when it is anticipated) increases the nominal interest rate on the public debt and through that the financial deficit of the government. The higher nominal interest payments are, however, compensated for by the reduction in the real value of the nominally denominated stock of public debt outstanding. By measuring the government financial deficit at real interest rates rather than at nominal rates, we would avoid the situation that the permissible change in the real value of the public debt becomes lower when the inflation rate increases, even when the real interest rate remains constant.

This suggests that an *inflation-corrected and cyclically-corrected golden rule* may be a better guide for public sector financing. It is given in (32):

$$\tilde{g}_C + \tilde{g}_T + \delta k - \tilde{\tau}_0 - \tilde{\theta}k + rb \leq 0 \quad (32)$$

Under this rule, government borrowing is constrained as follows:

$$\tilde{b} \leq \tilde{g}_I - \delta k - \tilde{n}b \quad (33)$$

that is,

$$\tilde{\eta} \leq \tilde{g}_I - \delta k + \pi b \quad (34)$$

The second obvious flaw of the cyclically corrected golden rule as a guide to debt sustainability and government solvency is that the amount of borrowing that is permitted is independent of the real growth rate of the economy. Clearly, other things equal, a higher real growth rate allows more borrowing without this adversely affecting debt sustainability.

These considerations suggest that the *cyclically corrected and inflation-and-real-growth-corrected golden rule*, given in (35), might be a more sensible and robust debt sustainability indicator.

$$\tilde{g}_C + \tilde{g}_T + \delta k - \tilde{\tau}_0 - \tilde{\theta}k + rb - \tilde{n}(b - k) \leq 0 \quad (35)$$

Given this rule, the government's budget identity implies:

$$\tilde{g}_C + \tilde{g}_T + \delta k - \tilde{\tau}_0 - \tilde{\theta}k + rb - \tilde{n}(b - k) \equiv \tilde{b} - \tilde{k} \leq 0 \quad (36)$$

$$\tilde{\eta} \leq \tilde{k} + (\tilde{n} + \tilde{\pi})b \quad (37)$$

or

$$\tilde{b} \leq \tilde{k} \quad (38)$$

Thus, under the cyclically corrected and inflation-and-real-growth-corrected golden rule, the government's stock of net assets, $b - k$, with the capital stock valued at current reproduction costs, will not increase (over the cycle or in the medium and long term). Whether or not this is a prudent rule depends on whether, from the point of view of generating a future cash flow, public sector capital formation is more like public sector debt repayment or more like public sector consumption.

It is useful to consider the three variants of the golden rule in some greater detail, under two very different assumptions about the cash returns to the government on public sector investment.

Case 1: public sector investment is financially equivalent to debt repayment.

Consider as the first benchmark the case where the net cash rate of return to the government on the public capital stock is the same as the cost of borrowing: $\theta - \delta = r$. In that case the government budget identity implies:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_C + \tilde{g}_T - \tilde{\tau}_0 + (r - \tilde{n})(\tilde{b} - \tilde{k}) \quad (39)$$

Under the *cyclically corrected and inflation-and-real-growth-corrected golden rule*, given in (37) or (38), the evolution of government net assets is government by:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_C + \tilde{g}_T - \tilde{\tau}_0 + (r - \tilde{n})(\tilde{b} - \tilde{k}) \leq 0 \quad (40)$$

When public sector capital earns a net financial rate of return equal to the government's cost of borrowing, from a financial or cash-flow point of view, government capital formation is exactly the opposite of government borrowing; it amounts to government debt repayment. The cyclically corrected, inflation-and-real-growth-corrected golden rule is clearly conservative in this case, as the government's net liabilities, government financial debt minus government capital valued at current reproduction cost is the same as the government's net liabilities, with capital valued as the present discounted value of future capital returns. Assuming the real growth rate is positive and the government's bond debt exceeds its real capital valued at current reproduction cost, the *cyclically- and inflation-corrected golden rule* would, as always be more conservative than the cyclically corrected, inflation-and-growth-corrected golden rule, as the former implies:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_C + \tilde{g}_T - \tilde{\tau}_0 + (r - \tilde{n})(\tilde{b} - \tilde{k}) \leq -\tilde{n}(\tilde{b} - \tilde{k}) \quad (41)$$

Finally, assuming that the inflation rate is positive and the stock of government financial debt is positive, the *cyclically corrected golden rule* itself would be even more conservative. Under this rule we would have:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_C + \tilde{g}_T - \tilde{\tau}_0 + (r - \tilde{n})(b - k) \leq -\tilde{n}(b - k) - \pi b \quad (42)$$

Obviously, the Stability and Growth Pact rule that the (cyclically corrected) budget deficit be non-positive is tighter than the cyclically corrected golden rule whenever net public sector capital formation is positive. Under the deficit constraint of the Stability and Growth Pact, net government assets evolve according to:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}^C + \tilde{g}^T - \tilde{\tau}_0 + (r - \tilde{n})(b - k) \leq -\tilde{n}(b - k) - \pi b - (\dot{k} + \tilde{n}k) \quad (43)$$

Case 2: public sector investment is financially equivalent to government consumption.

The other interesting benchmark is where the *gross* financial return on public sector investment is zero, that is, $\theta = 0$. In this case, from a financial or cash flow point of view, public sector capital formation is equivalent to government consumption. The government budget identity can now be written as

$$(g_C + g_T + g_I - \tau_0 + ib) - (\pi + n)b \equiv \dot{b} \quad (44)$$

The deficit ceiling of the Stability and Growth Pact for this case is

$$\tilde{\eta} \equiv \tilde{b} + (\pi + \tilde{n})\tilde{b} \equiv \tilde{g}_C + \tilde{g}_I + \tilde{g}_T - \tilde{\tau}_0 + ib \leq 0 \quad (45)$$

or

$$\tilde{\eta} \equiv \tilde{b} + (\pi + \tilde{n})\tilde{b} \equiv \tilde{g}_C + \delta k + \tilde{g}_T - \tilde{\tau}_0 + ib + \tilde{k} + \tilde{n}k \leq 0 \quad (46)$$

The cyclically-corrected golden rule for this case is

$$\tilde{g}_C + \delta k + \tilde{g}_T - \tilde{\tau}_0 + ib \leq 0 \quad (47)$$

The cyclically and inflation-corrected golden rule for this case is

$$\tilde{g}_C + \delta k + \tilde{g}_T - \tilde{\tau}_0 + rb \leq 0 \quad (48)$$

The cyclically and inflation- and real-growth-corrected golden rule becomes now:

$$\tilde{g}_C + \delta k + \tilde{g}_T - \tilde{\tau}_0 + (r - \tilde{n})b - \tilde{n}k \leq 0 \quad (49)$$

or

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_C + \tilde{g}_T - \tilde{\tau}_0 + (r - \tilde{n})(\tilde{b} - k) + (r + \delta)k \leq 0 \quad (50)$$

Comparing (50) with (40), we see that the absence of financial returns on the government capital stock puts a squeeze on government consumption, transfer payments and tax receipts. Capital valued at current reproduction costs has a price, in terms of current output of 1. Capital valued at the present value of its future financial returns has a negative value, reflecting the assumption that the gross financial rate of return on capital is zero ($\theta \equiv r + \delta = 0$). The net financial rate of return on capital is therefore equal to $-\delta$.

If public sector investment does not yield any cash income, it should be treated as consumption for the purpose of prudent financial management. That does not mean that one should never borrow to finance public sector investment. It does mean that any increase in public spending should be matched by an increase in current and future taxes, or by a reduction in current and future consumption spending, of equal present discounted value. For instance, an increase in permanent public investment spending should, *ceteris paribus*, be associated with an equal increase in permanent taxes or reduction in permanent public consumption or permanent transfer payments, as is clear from equation (21).

While in the case under consideration, public sector investment is, from a financial point of view, equivalent to public consumption, it does not follow that the cyclically adjusted (or even the cyclically adjusted, inflation-and-real-growth-corrected government budget (including public investment) should be balanced or in surplus. The reason is that sustainability does not require that government consumption (even cyclically corrected) should be financed out of current receipts rather than by borrowing. After all, the ultimate, fundamental rationale for all borrowing is *consumption* smoothing. Investment is just a round-about or indirect way of consumption smoothing, which is why borrowing for investment may be justified.

The cyclically, inflation- and real growth-adjusted golden rule gets some way towards a sensible and robust government borrowing rule. It fails to recognise, however, that there are many causes for variation over time in government current spending and current receipts, and that the business cycle is but one possible cause. This is *a-fortiori* true for government capital spending, which at times may well be bunched together rather than spread evenly over time. This is certainly the case when, as in the case of the UK, the general government capital stock has been allowed to depreciate and decline to an extent that is unprecedented in advanced industrial societies, and when – at last - a major programme of catch-up public

sector investment gets under way. There will be a temporary (although temporary could last as much as a decade) excess of actual public sector investment over ‘permanent’ (roughly long-run average) public investment.

The dangers associated with borrowing to finance investment without paying attention to the future cash-flow generating potential of the investment are present also with the inflation-corrected and inflation and real-growth corrected golden rules.

IV. The ‘Permanent Income’ Rule

The general case of unrestricted cash returns on the public sector capital stock implies the following solvency constraint:

$$b(t) \leq \int_t^{\infty} e^{-\int_t^v [r(u)-n(u)]du} (\tau_0(v) + \theta(v)k(v) - g_C(v) - g_T(v) - g_I(v)) dv$$

We now treat all spending and revenue flows other than taxes, τ_0 , as exogenous to the policy maker. The policy maker has to determine a rule for tax revenues that (1) ensures that the government’s solvency is guaranteed and (2) has other attractive features, from the perspective of cyclical stabilisation and the minimisation of the excess burden of distortionary taxation.

A prudent government borrowing rule is achieved if the share of government taxes in GDP, τ_0 is kept constant²⁵ at a value no less than the sum of the permanent government transfer share, the permanent public consumption share, the permanent public investment share and the long-run real growth-corrected real interest cost of the public debt, minus the permanent government capital income share. That is:

²⁵ In a stochastic world, it would only be constant ex-ante, or in expectation.

$$\tau_0 \geq -\theta^p k^p + g_T^p + g_C^p + g_I^p + (r^p - n^p)b \quad (51)$$

This rule means that the inflation-and-real-growth-corrected permanent government budget is in balance or in surplus. We call it the Permanent Income Rule, because of its analogies with the permanent income hypothesis of household consumption. A household's permanent income is that constant level of consumption that has the same present discounted value as its actual (anticipated) exogenous future endowment stream plus initial financial wealth. If a household consumes its permanent income, that consumption level is (ex-ante) the highest constant sustainable level of consumption over its lifetime. Our Permanent Income Rule for the share of taxes in GDP is that constant value of the share of taxes in GDP whose present discounted value (over an infinite future time horizon) equals the outstanding stock of public debt plus the present discounted value of actual government spending minus government capital income, all taken as a share of GDP.

This rule implies that

$$\dot{b} \leq g_T - g_T^p + g_C - g_C^p + g_I - g_I^p + \theta^p k^p - \theta k + [(r - r^p) - (n - n^p)]b \quad (52)$$

In terms of the conventionally measured financial general government deficit (52) implies:

$$\eta \leq (n + \pi)b + g_T - g_T^p + g_C - g_C^p + g_I - g_I^p + \theta^p k^p - \theta k + [(r - r^p) - (n - n^p)]b \quad (53)$$

This rule recognises that the debt-GDP ratio will be reduced, *ceteris paribus*, by nominal income growth, that is, it is an inflation-and real-growth-corrected measure. It can also be viewed as a corrected and generalised version of the golden rule: when actual government consumption is above permanent government consumption, or when actual government transfer payments and subsidies exceed their permanent values, the maximum amount of permitted borrowing increases *pari passu*. However, the same applies to borrowing for investment: public investment can only be safely financed by borrowing to the

extent that current public sector investment exceeds its permanent level. Finally, the borrowing limit is relaxed when the real interest rate is temporarily high or the real growth rate is temporarily low.

The Permanent Income Rule has four attractive features:

1. The Permanent Income rule is prudent - even cautious: it has government solvency built in. If the tax rule in (51) holds with equality, the (*ex-ante*) constant share of taxes in GDP is the smallest constant share of taxes in GDP that would satisfy the government's intertemporal budget constraint or solvency constraint.
2. The Permanent Income Rule is consistent both with Keynesian arguments for counter-cyclical deficits and with neo-classical (excess burden minimising) arguments for tax smoothing. It goes beyond them, however, by allowing for any kind of departure of current public transfer payments, consumption and investment spending from their long-run average or permanent levels. It also allows, in principle, for the effect on the interest cost of the public debt of departures of the current short real interest rate and the current real growth rate from their long-run or permanent values,.
3. The Permanent Income Rule allows for the effects of inflation and real GDP growth on the true burden of the public debt.
4. The Permanent Income Rule corrects and completes the golden rule by allowing fully for the degree, if any, to which public sector investment generates future cash flows to the government, either directly, say through user charges, or indirectly by the positive effect of general government capital on existing government tax bases.

Under the Permanent Income Rule for taxes, the long-run or steady-state government debt-GDP ratio is constant *ex-ante*. In a simple stochastic setting, the long-run or steady-state government debt-GDP ratio follows a random walk (see Barro [1979]).²⁶

²⁶ Long-run means $g_T = g_T^P$; $g_C = g_C^P$; $g_I = g_I^P$; $r = r^P$; $n = n^P$.

Conceptually, the Permanent Income Rule is both intuitive and simple. Of course, the permanent shares in GDP of public consumption and public investment are not observable. Nor is the long-run growth rate observable. In some countries, with index-linked long-dated public debt, reasonable proxies for the long-run real interest rate may be obtainable. Observance of the Permanent Income Rule would force governments to make explicit their assumptions about the long-run paths of public consumption, transfer payments and investment. That would be a positive development from the point of view of informed policy debate.

V. The Pact is myopic and does not handle diverse initial conditions well

Consider two countries with the same debt-GDP ratio and the same public sector consumption programmes. Country U has a low initial public sector capital stock and low implicit future state pension liabilities. This country wishes to build up its public sector capital stock. This means it would like to set $g_I > g_I^P$. This means that the country would like to borrow. It ought to be able to borrow, and the Permanent Income Rule would permit it to borrow. The Stability and Growth Pact, however, would stop it from borrowing (on a cyclically adjusted basis). The catch-up investment boom in the public sector could easily take one or two decades.

Now consider country I , which has a large public sector capital stock but also has large implicit future state pension liabilities. For this country, $g_I \leq g_I^P$, and $g_T \square g_T^P$. The last inequality reflects the expectation that future state pension benefit payments will exceed current levels. The Permanent Income Rule implies that, *cet. par.*, country I should be reducing its debt-GDP ratio now, in order to make room for these future pension obligations. The Stability and Growth Pact rules consider only the present and the past (as summarised in

the outstanding stock of debt). It will not suggest any need for fiscal restraint until the high future pension payments are upon us.

If this is a serious issue for countries U and I , it is an even more serious issue for the accession candidates. Despite a decade of, by and large, successful transition, the infrastructure of these countries is in a woeful state. They should be investing heavily in infrastructure ($g_I \square g_I^P$). Indeed the ‘Acquis’ requires them to engage in such investment. There is also a disastrous environmental legacy in the accession candidates. Both the ‘Acquis’ and common sense mandate a large-scale environmental clean-up effort. It does not matter whether this expenditure is classified under public investment or public consumption. There can be no doubt that the accession candidates should be, for the next decade or two, in a position where, at least for the environmental expenditures, $g_C + g_I \square g_C^P + g_I^P$. Ceteris paribus, this justifies a rising public debt-GDP ratio, according to the Permanent Income Rule. The Stability and Growth Pact may, however, prevent these essential expenditures from occurring, unless they can be financed contemporaneously by cuts in other expenditures, tax increases and transfers from the EU budget.

It is of course essential that, with such large infrastructure and environmental spending programmes mandated by unfortunate initial conditions, every expenditure item and tax exemption in the general government budget be scrutinised most carefully. Eliminating harmful and wasteful expenditures and tax exemptions should always be at the top of budget agenda.

Finally, consider again two countries, once more labelled U and I . They are the same, except that U has a low public debt and a low public sector capital stock, while I has a high public debt and a high public sector capital stock. Assume that $b - k$ is the same for both countries, and assume, to simplify the argument, that the net financial real rate of return on the public sector capital stock equals the risk-free real rate of interest: $\theta - \delta = r$. Assume

that country U wishes to raise both k and b , keeping $k - b$ constant; country I wishes to reduce both k and b , again keeping $k - b$ constant. Under the Stability and Growth Pact, country U will not be allowed to do what it wants to do, while country I is. This makes no sense. The Permanent Income Rule, of course, handles this case gracefully. With $g_I > g_I^P$ country U can increase its debt-GDP ratio according to the Permanent Income Rule, and with $g_I < g_I^P$ country I can reduce its debt-GDP ratio.

6. Conclusion

We conclude that the Stability and Growth Pact's 'close to balance or in surplus' requirement and the Maastricht Treaty's 3% of GDP reference value for the general government budget deficit are not well-designed to deliver their objectives of viable fiscal-financial programmes conducive to sustainable growth. The aim of preventing excessive government deficits and excessive public debt is shared by everyone. The assumption underlying the Pact that, taken over the cycle or in the medium term, any government budget deficit is excessive must be rejected.

It is demonstrably not true that budget deficits that violate the 3 % of GDP deficit norm, are *necessarily* 'excessive', that is, do more harm than good to the country whose government runs such deficits or to its EMU partners, even if the economy is not in deep recession. *A fortiori*, it is not true that government budget deficits which systematically and persistently violate the 'close to balance or in surplus' property are necessarily harmful.

The uniform numerical deficit rules of the Pact (and the uniform debt norm of the Maastricht Treaty) can cause serious problems even for existing EU members whose initial conditions are different from the EU average and whose medium-term growth rates and inflation rates may differ significantly from the EU average. The problem of 'one Pact fits all' will be even more serious for the accession candidates.

High nominal GDP growth rates (through real GDP catch-up and Balassa-Samuelson effects with a fixed exchange rate or a common currency) make, other things being equal, higher debt-GDP ratios sustainable. Higher real GDP growth rates and lower risk-free interest rates (through financial market integration and Balassa-Samuelson effects under a fixed exchange rate or a common currency) also enhance the authorities' ability to sustain debt and deficits. The need to catch up in the areas of infrastructure and environmental standards also justifies increased recourse to borrowing. Our proposed 'Permanent Income Rule' for the share of taxes in GDP offers a starting point for designing more robust fiscal norms.

The operational expression in the Stability and Growth Pact of the commendable desire to avoid excessive government deficits has been problematic from the start. With EU enlargement upon us, and the imminent entry of ten or more countries with quite distinct growth and inflation prospects and with very different public expenditure needs owing to their unique initial conditions, the shortcomings of the Pact are becoming more apparent. It is now widely recognised that the Pact rules and norms may well do more harm than good. This creates a dilemma.

If policy makers have staked their credibility on these norms being met, then failing to meet them will damage credibility, even though the norms are now recognised as seriously flawed. Sticking to norms that do not make much sense, however, will also be damaging and is unlikely to be politically sustainable. There is no costless way out of this cul-de-sac. Taking a long-term view, however, the cost of sticking with seriously flawed rules is bound to dominate the loss of credibility associated with abandoning a commitment to the ill-designed rule. It is therefore best to admit the error of one's ways as soon as possible, to re-emphasize and re-affirm the purpose of debt sustainability and fiscal prudence, and to adopt a set of rules or principles that are both robust and flexible.

References

Barro, Robert J. [1979], "On the Determination of the Public Debt," *Journal of Political Economy*, October.

Blanchard, Olivier and Roberto Perotti [1999] "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output", NBER Working Paper 7269

Buiter, Willem H. "Notes on 'A Code for Fiscal Stability'" [2001], *Oxford Economic Papers*, Vol 53, No 1, pp.1-19, January.

Buiter, Willem H. and Kenneth M. Kletzer [1991a] "Reflections on the fiscal implications of a common currency", with Kenneth M. Kletzer, in Alberto Giovannini and Colin Mayer eds., *European Financial Integration*, Cambridge University Press, Cambridge, 1991, pp.221-244.

Buiter, Willem H. and Kenneth M. Kletzer [1991b], "The Welfare Economics of Cooperative and Non-Cooperative Fiscal Policy, *Journal of Economic Dynamics and Control*, 15, 1991, pp. 215-244

Buiter, Willem H., Giancarlo Corsetti and Paolo Pesenti [1993], "Excessive deficits: sense and nonsense in the Treaty of Maastricht", with Giancarlo Corsetti and Nouriel Roubini, *Economic Policy*, 1993 (1); translated into Italian and published as "Disavanzo eccessivo,ragionevolezza e nonsenso nel Trattato di Maastricht", in *Rivista Di Politica Economica*, June 1993, pp.3-82. Reprinted in *The Political Economy of Monetary Union*, Edited by Paul de Grauwe, pp. 297-331, Edward Elgar Publishing Ltd, Cheltenham, 2001.

Chamley, Christophe [1981], "The Welfare Cost of Capital Income Taxation in a Growing Economy," *Journal of Political Economy* , June.

Chamley, Christophe [1986], "Optimal Taxation of Capital Income in Economies with Identical Private and Social Discount Rates," *Econometrica*, May.

Lane, Philip R. and Roberto Perotti [1999] "The Importance of Composition of Fiscal Policy: Evidence From Different Exchange Rate Regimes", Columbia University mimeo

Kletzer, Kenneth and Jürgen von Hagen [2000] "Monetary Union and Fiscal Federalism", ZEI Working Paper B1

Lucas, Robert E. [1988], "On the Mechanics of Economic Development", *Journal of Monetary Economics*, 22, pp. 3-42.

Mendoza, Enrique G. and Linda L.Tesar [1998] "The International Ramifications of Tax Reforms: Supply Side Economics in a Global Economy", *American Economic Review*, March Vol 88

Melitz, Jaques and Frederic Zumer [1998] "Regional Redistribution and Stabilization by the Centre in Canada, France, the United Kingdom and the United States: New Estimates Based on Panel Data Econometrics." CEPR Discussion Paper 1829

Obstfeld, Maurice and Giovanni Peri [1998] “Regional Non-Adjustment and Fiscal Policy”
Economic Policy, 26

van Wincoop, Eric [1995], “Regional Risk Sharing” *European Economic Review* 39, 1545-68

Appendix 1

Resolution of the European Council on the Stability and Growth Pact Amsterdam, 17 June 1997

Official Journal C 236, 02/08/1997 p. 0001 - 0002

Text:

RESOLUTION OF THE EUROPEAN COUNCIL on the Stability and Growth Pact Amsterdam, 17 June 1997 (97/C 236/01)

- I. Meeting in Madrid in December 1995, the European Council confirmed the crucial importance of securing budgetary discipline in stage three of Economic and Monetary Union (EMU). In Florence, six months later, the European Council reiterated this view and in Dublin, in December 1996, it reached an agreement on the main elements of the Stability and Growth Pact. In stage three of EMU, Member States shall avoid excessive general government deficits: this is a clear Treaty obligation (1).²⁷ The European Council underlines the importance of safeguarding sound government finances as a means to strengthening the conditions for price stability and for strong sustainable growth conducive to employment creation. It is also necessary to ensure that national budgetary policies support stability oriented monetary policies. Adherence to the objective of sound budgetary positions close to balance or in surplus will allow all Member States to deal with normal cyclical fluctuations while keeping the government deficit within the reference value of 3 % of GDP.
- II. Meeting in Dublin in December 1996, the European Council requested the preparation of a Stability and Growth Pact to be achieved in accordance with the principles and procedures of the Treaty. This Stability and Growth Pact in no way changes the requirements for participation in stage three of EMU, either in the first group or at a later date. Member States remain responsible for their national budgetary policies, subject to the provisions of the Treaty; they will take the necessary measures in order to meet their responsibilities in accordance with those provisions.
- III. The Stability and Growth Pact, which provides both for prevention and deterrence, consists of this Resolution and two Council Regulations, one on the strengthening of the surveillance of budgetary positions and the surveillance and coordination of economic policies and another on speeding up and clarifying the implementation of the excessive deficit procedure.
- IV. The European Council solemnly invites all parties, namely the Member States, the Council of the European Union and the Commission of the European Communities, to implement the Treaty and the Stability and Growth Pact in a strict and timely manner. This Resolution provides firm political guidance to the parties who will implement the Stability and Growth Pact. To this end, the European Council has agreed upon the following guidelines:

THE MEMBER STATES

1. commit themselves to respect the medium-term budgetary objective of positions close to balance or in surplus set out in their stability or convergence programmes and to take the corrective budgetary action they deem necessary to meet the objectives of their stability or convergence programmes, whenever they have information indicating actual or expected significant divergence from those objectives;
2. are invited to make public, on their own initiative, the Council recommendations made to them in accordance with Article 103 (4);
3. commit themselves to take the corrective budgetary action they deem necessary to meet the objectives of their stability or convergence programmes once they receive an early warning in the form of a Council recommendation issued under Article 103 (4);
4. will launch the corrective budgetary adjustments they deem necessary without delay on receiving information indicating the risk of an excessive deficit;
5. will correct excessive deficits as quickly as possible after their emergence; this correction should be completed no later than the year following the identification of the excessive deficit, unless there are special circumstances;
6. are invited to make public, on their own initiative, recommendations made in accordance with Article 104c (7);
1. commit themselves not to invoke the benefit of Article 2 (3) of the Council Regulation on speeding up and clarifying the excessive deficit procedure unless they are in severe recession; in evaluating whether the economic downturn is severe, the Member States will, as a rule, take as a reference point an annual fall in real GDP of at least 0,75 %.

²⁷ Under Article 5 of Protocol 11, this obligation does not apply to the United Kingdom unless it moves to the third stage; the obligation under Article 109e (4) of the Treaty establishing the European Community to endeavour to avoid excessive deficits shall continue to apply to the United Kingdom.

THE COMMISSION

1. will exercise its right of initiative under the Treaty in a manner that facilitates the strict, timely and effective functioning of the Stability and Growth Pact;
2. will present, without delay, the necessary reports, opinions and recommendations to enable the Council to adopt decisions under Article 103 and Article 104c; this will facilitate the effective functioning of the early warning system and the rapid launch and strict application of the excessive deficit procedure;
3. commits itself to prepare a report under Article 104c (3) whenever there is the risk of an excessive deficit or whenever the planned or actual government deficit exceeds the reference value of 3 % of GDP, thereby triggering the procedure under Article 104c (3);
4. commits itself, in the event that the Commission considers that a deficit exceeding 3 % of GDP is not excessive and this opinion differs from that of the Economic and Financial Committee, to present in writing to the Council the reasons for its position;
5. commits itself, following a request from the Council under Article 109d, to make, as a rule, a recommendation for a Council decision on whether an excessive deficit exists under Article 104c (6).

THE COUNCIL

1. is committed to a rigorous and timely implementation of all elements of the Stability and Growth Pact in its competence; it will take the necessary decisions under Article 103 and Article 104c as is practicable;
2. is urged to regard the deadlines for the application of the excessive deficit procedure as upper limits; in particular, the Council, acting under Article 104c (7), shall recommend that excessive deficits be corrected as quickly as possible after their emergence, no later than the year following their identification, unless there are special circumstances;
3. is invited always to impose sanctions if a participating Member State fails to take the necessary steps to bring the excessive deficit situation to an end as recommended by the Council;
4. is urged always to require a non-interest bearing deposit, whenever the Council decides to impose sanctions on a participating Member State in accordance with Article 104c (11);
5. is urged always to convert a deposit into a fine after two years of the decision to impose sanctions in accordance with Article 104c (11), unless the excessive deficit has in the view of the Council been corrected;
6. is invited always to state in writing the reasons which justify a decision not to act if at any stage of the excessive deficit or surveillance of budgetary positions procedures the Council did not act on a Commission recommendation and, in such a case, to make public the votes cast by each Member State.

Table 1
General Government Financial Balance in 10 Central and East European Accession Candidates
 (% of GDP)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Czech Republic	na	-0.2	-1.9	-3.1	0.5	-1.1	-1.4	-0.9	-1.7	-2.0	-3.3	-4.9	-6.0
Estonia	na	na	Na	na	-10.0	1.4	-0.6	-1.9	2.2	-0.3	-4.6	-0.7	-0.5
Hungary	na	-0.0	-3.0	-7.2	-6.6	-8.4	-6.7	-5.0	-6.6	-5.6	-5.7	-3.4	-3.3
Latvia	na	na	Na	na	Na	-4.4	-3.9	-1.8	0.3	-0.8	-3.9	-3.3	-1.8
Lithuania	na	na	Na	na	-5.3	-4.8	-4.5	-4.5	-1.8	-5.9	-8.5	-2.7	-1.7
Poland	-7.4	3.1	-2.1	-4.9	-2.4	-2.2	-3.1	-3.3	-3.1	-3.2	-3.7	-3.2	-6.0
Slovak Republic	na	na	Na	-11.9	-6.0	-1.5	0.4	-1.3	-5.2	-5.0	-3.6	-3.6	-3.9
Slovenia	na	na	2.6	0.3	0.6	-0.2	-0.3	-0.2	-1.7	-1.4	-0.9	-1.3	-1.5
Central Europe And the Baltic states	-7.4	1.0	-1.1	-5.1	-3.8	-2.2	-2.4	-2.2	-2.2	-2.8	-4.5	-3.3	-3.3
Bulgaria	-1.0	-8.1	-4.5	-2.9	-8.7	-3.9	-5.7	-10.4	-2.1	0.9	-0.9	-1.1	-1.5
Romania	na	Na	Na	-4.6	-0.4	-2.2	-2.5	-3.9	-4.6	-5.0	-3.5	-3.7	-3.5

Source EBRD

Table 2
General Government Budget Balance for EU, US and Japan
 (% of GDP)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
EUROPEAN UNION	-2.7	-3.8	-4.4	-5.2	-6.3	-5.6	-5.3	-4.3	-2.4	-1.6	-0.7	0.9	-0.6	-1
EURO AREA	-3.6	-4.7	-4.8	-5	-5.9	-5.3	-5.3	-4.4	-2.6	-2.2	-1.3	0.2	-1	-1.4
AUSTRIA	-3.1	-2.4	-3	-2	-4.2	-5	-5.1	-3.8	-1.7	-2.3	-2.1	-1.1	-0.1	-0.4
BELGIUM	-7.6	-6.7	-7.3	-7.9	-7.3	-5	-4.3	-3.7	-2	-0.8	-0.6	0.1	0	-0.9
DENMARK	0.3	-1	-2.4	-2.2	-2.8	-2.4	-2.3	-1	0.5	1.1	3.1	2.8	2.2	1.7
FINLAND	6.7	5.3	-1.1	-5.6	-7.3	-5.7	-3.7	-3.2	-1.5	1.3	1.9	6.9	4.6	2.6
FRANCE	-1.8	-2.1	-2.4	-4.2	-6	-5.5	-5.5	-4.1	-3	-2.7	-1.6	-1.4	-0.9	-2.1
GERMANY	0.1	-2	-3	-2.5	-3.1	-2.4	-3.3	-3.4	-2.7	-2.2	-1.6	1.2	-2.5	-2.5
GREECE	-14.4	-16.1	-11.5	-12.8	-13.8	-10	-10.2	-7.4	-4	-2.4	-1.8	-1.1	0.5	0.9
IRELAND	-1.7	-2.2	-2.3	-2.4	-2.3	-1.7	-2.2	-0.2	1.2	2.3	4.1	4.5	2.2	1
ITALY	-9.8	-11	-10	-9.5	-9.4	-9.1	-7.6	-7.1	-2.7	-2.8	-1.8	-0.3	-1.2	-1
LUXEMBOURG	4.4	5.3	1.5	0.7	2.2	3	2.3	2	3.4	3.5	3.7	6.1	5.6	5
NETHERLANDS	-4.6	-4.9	-2.7	-3.7	-3.1	-3.6	-4.2	-1.8	-1.1	-0.8	0.4	2.2	0.5	0
PORTUGAL	-2.4	-5.1	-6	-2.9	-6.1	-6	-4.6	-4	-2.6	-1.9	-2.1	-1.5	-2.8	-2.5
SPAIN	-2.7	-3.6	-4.3	-4	-6.7	-6.1	-7	-4.9	-3.2	-2.6	-1.2	-0.3	-0.3	-0.3
SWEDEN	5.2	4	-1.1	-7.5	-11.9	-10.8	-7.9	-3.4	-2	1.8	1.9	4.4	4.6	2.4
UNITED KINGDOM	0.1	-1	-3	-6.6	-7.7	-6.8	-5.4	-4.1	-1.5	0.3	1.5	3.9	0.5	-0.1
UNITED STATES	-3.4	-4.4	-5.1	-6	-5.1	-3.8	-3.3	-2.4	-1.3	-0.1	0.6	1.5	0.3	-0.5
JAPAN	2.4	2.8	2.8	1.4	-1.6	-2.2	-3.5	-4.2	-3.2	-4.5	-6.8	-7.9	-7.2	-7.1
Source WEO														

Table 3
Gross Total Public Debt in 10 Central and East European Accession Candidates
(% of GDP)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Bulgaria	23	35	154	159	151	160	111	156	119	103	98	94
Czech Republic	0	0	0	11	24	20	16	13	12	12	14	17
Estonia	0	0	0	0	5	5	5	8	8	7	7	6
Hungary	0	46	70	74	85	137	131	108	89	89	91	85
Latvia	0	0	0	0	0	5	7	15	12	11	13	13
Lithuania	0	0	0	0	0	12	13	16	21	22	28	27
Poland	0	0	0	0	26	70	57	49	49	44	45	43
Romania	0	0	0	3	4	5	20	23	25	24	30	28
Slovak Republic	0	0	0	0	3	3	2	11	11	14	16	19
Slovenia	0	8	11	10	28	25	23	24	25	26	26	27
Average												36

Source: EBRD

Table 4
General government gross debt, EU, US and Japan
 (% of GDP)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
EU15	:	:	:	66.3	70.6	72.5	71.1	68.9	68	64.1
EUR-12	58.5	60.4	66.2	68.9	73.5	75.1	74.9	74.1	72.6	70.2
Austria	57.5	57.2	61.8	64.7	69.2	69.1	64.7	63.9	64.7	63.1
Belgium	130.1	131.4	138.1	136.8	133.9	130.1	125.3	119.7	115.9	110.3
Denmark	62.5	66.3	78	73.5	69.3	65.1	61.2	55.6	52	46.1
Finland	22.6	40.6	56	58	57.2	57.1	54.1	48.8	47.3	44
France	35.8	39.6	45.3	48.4	54.6	57.1	59.3	59.5	58.5	57.6
Germany	40.4	42.9	46.9	49.3	57	59.8	61	60.9	61.3	60.3
Greece	82.2	87.8	110.1	107.9	108.7	111.3	108.2	105	103.9	102.7
Ireland	102.8	100.1	96.2	90.4	82.6	74.2	65.1	54.8	49.3	38.6
Italy	100.6	107.7	118.1	123.8	123.2	122.1	120.2	116.4	114.6	110.5
Luxembourg	4.2	5	6.2	5.7	5.6	6.2	6.1	6.4	6	5.3
Netherlands	76.9	77.8	79	76.3	77.2	75.2	69.9	66.8	63.1	56.1
Portugal	60.7	54.4	59.1	62.1	64.3	62.7	58.9	54.7	54.5	53.7
Spain	44.3	46.8	58.4	61.1	63.9	68.1	66.7	64.7	63.4	60.7
Sweden	:	:	:	76.2	76.2	76	73.1	70.5	65.3	55.7
UK	34.4	39.2	45.4	48.5	51.8	52.3	51.1	48.1	45.7	42.8
US	71.4	74.1	75.8	75	74.5	73.9	71.4	68.5	65.5	60.3
Japan	56.6	58	62.3	67.1	73.9	78.8	82.7	94.1	101.7	109

Source Eurostat, OECD

Table 5 Notation

B : total stock of nominal, interest-bearing general government debt held either by the central bank, the domestic private sector or the rest of the world. For notational simplicity, we assume that the general government does not hold any financial assets, so gross general government debt is the same as net general government debt.

B^{CB} : stock of nominal, interest-bearing general government debt held by the central bank.

M : nominal stock of base money.

R^* : stock of official foreign exchange reserves held by the central bank.

g_T : general government transfers and subsidies as a fraction of GDP.

g_C : general government consumption as a fraction of GDP

g_I : gross general government capital formation as a fraction of GDP

$g \equiv g_T + g_C + g_I$: total public spending as a fraction of GDP.

τ : total general government taxes and other current revenues (including payments made by the central bank to the general government) as a fraction of GDP.

τ^{CB} : payments by the central bank to the general government, as a fraction of GDP.

i : domestic instantaneous nominal interest rate.

i^* : foreign instantaneous nominal interest rate (assumed to be the interest rate earned on official foreign exchange reserves).

P : domestic GDP deflator.

$\pi \equiv \dot{P}/P$: domestic rate of inflation.

E : nominal spot exchange rate (the domestic currency price of foreign currency).

$\varepsilon \equiv \dot{E}/E$: proportional rate of depreciation of the nominal exchange rate.

Y : domestic real GDP.

$n \equiv \dot{Y}/Y$: proportional growth rate of real GDP.

$r \equiv i - \pi$: instantaneous domestic real interest rate.

R : domestic instantaneous real rate of interest.

$m \equiv M/(PY)$: ratio of base money to nominal GDP.

$b \equiv B/(PY)$: ratio of gross (and net) general government debt to GDP.

$b^{CB} \equiv B^{CB}/(PY)$: ratio of domestic credit (general government debt held by the central bank) to GDP.

$\rho^* \equiv ER^*/(PY)$: ratio of official foreign exchange reserves to GDP.

$\sigma \equiv \dot{M}/(PY) \equiv \dot{m} + (\pi + n)m$: net base money creation as a fraction of GDP or 'seigniorage'.

$\eta \equiv \dot{B}/(PY)$: general government financial deficit as a fraction of GDP.

$s \equiv \tau - g$: general government primary (non-interest) surplus as a fraction of GDP.

k : ratio of general government capital stock to GDP.

δ : proportional rate of depreciation of the general government capital stock.

θ : gross financial rate of return on the general government capital stock.

τ_0 : general government tax revenues as a fraction of GDP.

Cyclically adjusted values are denoted by tildes.

Steady state values are denoted by overbars.

Table 6
Real GDP per capita in accession candidates compared to EU average
(current \$ and PPP)

	GNP p.c. as percentage of EU averages			
	market prices		PPP	
	1986	1997	1986	1997
% of EU 99				
Greece	46	55		
Ireland	64	85		
Portugal	31	49		
Spain	57	64		
average	49	63		
Czech Rep.		25		57
Estonia		15		35
Hungary		21		46
Poland		18		35
Slovenia		44		67
average		25		48
% of EU 85				
Greece	39	48	62	68
Ireland	55	73	48	76
Portugal	27	42	49	62
Spain	49	55	62	68
average	42	54	55	69