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**PATCHING UP THE PACT: SOME
SUGGESTIONS FOR ENHANCING
FISCAL SUSTAINABILITY AND
MACROECONOMIC STABILITY IN AN
ENLARGED EUROPEAN UNION**

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ABSTRACT

Patching up the Pact: some Suggestions for Enhancing Fiscal Sustainability and Macroeconomic Stability in an Enlarged European Union*

The Paper considers the implications for the EU accession candidates of Central and Eastern Europe of the fiscal-financial constraints imposed by the Stability and Growth Pact and the Maastricht Treaty. Our findings apply also to those current EU members whose initial conditions (e.g. infrastructure and progress in state pension reform) or other structural characteristics (e.g. demographic structure, growth potential, Balassa-Samuelson equilibrium real exchange rate appreciation) differ significantly from the EU average. We find the existing criteria to be seriously flawed and propose an alternative rule, the Permanent Balance Rule, based on a strong form of tax smoothing.

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Introduction

The purpose of this paper is to discuss the fiscal rules that govern countries in the European Union (EU) and their implications for the Central European countries that are candidates for early EU accession.¹ We argue that both the Stability and Growth Pact and the Broad Economic Policy Guidelines currently in place are ill-designed to address the economic realities of countries that differ vastly from the current EU average as regards their expected future nominal GDP growth rates and their inherited stocks of environmental and public sector capital. While the issues addressed are not unique to the accession candidates, their importance is magnified by the current enlargement round because enlargement will substantially increase the structural diversity of the economies inside the European Union, and will do so in ways that are relevant to the cost-benefit balance of adherence to the current EU fiscal rules. We discuss possible reforms of the current system including the ‘*Golden Rule*’ advocated and implemented by the UK, and argue that the best framework would be a so-called ‘*Permanent Balance*’ rule.

Thirteen countries are currently candidates for accession to the European Union.² 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 Cyprus and Malta) are countries of operation of the European Bank for Reconstruction

¹ The study of EMU and the Stability and Growth Pact has become a major growth industry. A small sample includes Artis and Buti [2000], Bayar [2001], Beetsma and Uhlig [1999], Chari and Kehoe [1998], Dalsgaard and DeSerres [1999], Eichengreen and Wyplosz [1998], Kell [2001], Mongelli [1999] and Wyplosz [1999]. An earlier contribution covering similar ground is Buiter, Corsetti and Roubini [1993].

² They are: Bulgaria, the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, the Slovak Republic, Slovenia and Turkey.

and Development (EBRD). Bulgaria and Romania are expected to conclude their accession negotiations and join the EU at some later date.³

All new EU members will automatically, upon entry in the EU, be bound by the rules of the *Stability and Growth Pact* (the Pact) and the *Broad Economic Policy Guidelines* (BEPGs). Following EU accession, none of the accession candidates will be able to obtain an *opt-out* from membership in the Economic and Monetary Union (EMU), as the UK and Denmark did in the Maastricht Treaty of 1992.⁴ Eventual EMU membership is now part of the ‘Acquis Communautaire’. Of course, a set of conditions (the Maastricht conditions, after the Treaty of Maastricht) have to be satisfied in order for the new EU members to qualify for EMU membership. Until these conditions are satisfied, the new EU members will have a *derogation* from full EMU membership, like Sweden since January 1, 1999.

Like the three current EU members that are not also EMU members, the accession countries will, once they join the EU, have to present annual *Convergence Programmes* to the Commission and the Council of Ministers.⁵

In addition to the Convergence Programmes mandated under the Pact, any new EU members will be expected to follow the annual recommendation of the Council (proposed to the Council by the Commission) on the *Broad Economic Policy Guidelines* (BEPGs).⁶ These BEPGs go well beyond what is required by the Stability and Growth Pact both in the scope and in the detail of its recommendations, and include structural reform, employment and wage developments, in addition to budgetary issues. Other than ‘naming and shaming’, no

³ 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 in due course, and the ultimate boundaries of the EU may well extend quite far to the east, beyond what is currently envisaged.

⁴ These opt-outs were confirmed in subsequent revisions of the Treaty, such as the Treaty of Amsterdam, in 1997.

⁵ EMU members present annual *Stability Programmes*.

sanctions follow a failure to follow the recommendations in the BEPGs. In its meeting of 12 February the (ECOFIN) Council considered Ireland's budgetary plans for 2001 inappropriately expansionary and thus inconsistent with the 2000 BEPGs, and issued a recommendation to Ireland to end this inconsistency.

In this paper we demonstrate the shortcomings of the existing fiscal-financial criteria and suggest ways of amending and improving the fiscal-financial rules of the Stability and Growth Pact so as to enhance fiscal-financial sustainability and macroeconomic stability.

What we argue is that the appropriate operational expression of the concepts of *sustainable* and *stabilising* fiscal-financial policies ought to depend on certain key structural economic features of the economy. All of these features are quite intuitive and can be given simple economic justifications. Some, but not all, of these features are observable, identifiable and verifiable in a reasonably objective manner. Others involve expectations of, or plans for, the future. They therefore inherently involve judgement and elements of subjective interpretation. This inevitably means that the determination of whether a country's fiscal-financial programme is sustainable, or whether a particular sequence of current and anticipated future deficits is excessive, cannot be reduced to a mechanical test, but will involve judgement, discussion and potential disagreement. In our view, this is not a weakness but a virtue, because it represents recognition of the basic truth that issues of fiscal-financial stability cannot be resolved without an explicit, and potentially contestable, judgement about future plans and expectations about future economic developments. In the long run, honesty beats spurious precision.

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, increase the

⁶ The full name is 'Broad Guidelines of the Economic Policies of the Members States and the

importance of addressing the problems that will be encountered when the one-size-fits-all fiscal-financial criteria of the Stability and Growth Pact and the Maastricht Treaty are confronted with the heterogeneous real economic structures of an enlarged EU.

We do not argue that countries with markedly distinct real economic structures cannot all prosper in the European Union. They will prosper, provided proper allowance is made in the design of fiscal-financial rules for marked differences in economic structure. We also do not argue that countries with very different real economic structures should not join together in a monetary union or that there should be any protracted delay between EU accession and EMU membership for the leading cohort of current accession candidates. To the contrary, we have argued elsewhere (Buiter and Grafe [2001, 2002]) for the earliest possible EMU membership for all successful EU applicants.

The remainder of this paper is organised as follows. In Section I, we summarise the Stability and Growth Pact and Maastricht fiscal-financial criteria. In Section II we introduce a simplified accounting framework for tracking some key indicators of a national government's fiscal-financial performance. Section III reviews the arguments for the existence of a bias towards excessive deficits in modern mixed market economies. Section IV reviews the implications of the Pact and the Treaty for the conduct of countercyclical fiscal policy. Section V discusses some of the surprising long-run implications of the Pact.

Section VI point out that there is no mechanism for coordinating national fiscal stabilisation policies or for coordinating national fiscal policies with the EMU-wide monetary policy determined by the European Central Bank (ECB). Section VII explains why persistent real growth differentials between existing EU members and EU accession candidates and persistent real appreciation of accession country currencies vis-à-vis the euro should be expected. Both phenomena have direct implications for the design of sensible sustainable

fiscal policies. The chapter also considers the appropriate treatment of public sector investment expenditure in a sustainable fiscal framework. This is of special relevance to East European accession candidates, whose inherited stocks of infrastructure capital and environmental capital are severely depleted. Here we also consider the operating characteristics of an alternative fiscal rule, the *Golden Rule*, which is part of the British budget framework.⁷ Section VIII introduces our preferred fiscal rule, the *Permanent Balance Rule*, which incorporates a strong form of intertemporal tax smoothing. Section IX contrasts the performance of the Stability and Growth Pact rules with the performance of the Permanent Balance rule for an economy characterised by a low stock of social overhead capital or environmental capital, and for economies with different combinations of government indebtedness and future state pension obligations. Section X concludes.

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

The paragraph of the Pact that is operationally relevant for budgetary policy because it constrains permissible fiscal-financial rules is (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.”*⁸

⁷ The analysis extends that in Buiter and Kletzer [1991a], Buiter, Corsetti and Pesenti [1993] and Buiter [2001].

⁸ 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 wishes to join EMU. This is because the UK obtained an opt-out from the obligation to join EMU (to proceed to the ‘third stage’ of the EMU process). While Denmark also has an EMU opt-out, it appears that it is required, unlike the UK, to meet the deficit criterion. For instance the Council Opinion of 5 March 2002 on the updated convergence programme of Denmark, 2001-2005, states: “Denmark is also expected to be able to withstand a normal cyclical downturn without breaching the 3 % of GDP deficit reference value.” Sweden does not have an EMU opt-out and therefore has to be able to withstand a normal cyclical downturn without breaching the 3 % of GDP deficit reference value. It is not anticipated that any of the current or future accession candidates will be able to obtain a UK-or Denmark-style EMU opt-out, although for a while they may well have derogations, as Sweden does today, if they are deemed not to have satisfied all the convergence criteria. Despite its opt-out, the UK is required to

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 *deficit criterion*.⁹ The criterion in (2), constraining the cyclically adjusted or medium-term deficit, will be called the *cyclically adjusted deficit criterion*.¹⁰ For EMU candidates, but not for the existing EMU members or the existing EU member with an EMU opt-out, the further constraint applies as a condition for EMU

endeavour to avoid excessive deficits, and the requirements of ‘close to balance or surplus in the medium term’ contained in the Stability and Growth Pact 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). For a good description of the Stability and Growth Pact see European Central Bank [1999], “The Implementation of the Stability and Growth Pact”, pp. 45-72.

⁹ 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 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.

¹⁰ Equation (2) would seem to be the appropriate algebraic representation of “close to balance or in surplus”. If a small, medium term deficit of magnitude $\xi > 0$ is tolerated, Equation (2)

membership, that the general government gross stock of debt be less than 60 percent of annual GDP.

$$b \leq 0.6 \tag{3}$$

We shall refer to the criterion in (3) as the *debt criterion*.

The reasoning behind the assignment of these three specific numerical values for the deficit and debt ceilings has to our best knowledge never been made public. Indeed, the reasons for choosing *any* fixed numerical values rather than more flexible state-contingent rules have never been explained. As regards the 60 percent of GDP general government gross debt to annual GDP ceiling, it may not be a coincidence that the historical value of that ratio during 1992, the year the Maastricht Treaty was signed, happened to be 60.4 percent on average for the 15 EU members.¹¹ The debt-GDP ratio in 1992 was on a rising trajectory. For the 11 first-wave EMU members, the ratio peaked in 1996 at 75.4 percent. At the end of 2000 it stood at 69.5 percent.

No obvious historical benchmark can be offered for the 3 percent of GDP numerical ceiling for the deficit. In 1992 the actual general government deficit-GDP ratio averaged 5.1 percent of GDP for the 15 EU members. Two possible explanations for the numerical ceiling have been offered. It has been suggested that, since a deficit-GDP ratio of three percent stabilises a (net) debt- annual GDP ratio of 60 percent when the annual growth rate of nominal income is 5 percent, this might provide a bridge between the debt ceiling and the deficit ceiling.¹² However, the debt criterion is defined in terms of *gross* rather than *net* debt, and five percent nominal GDP growth is probably somewhat in excess of the long-run expected growth rate of nominal GDP that the authors of the Maastricht criteria had in

should be replaced by $\tilde{\eta} \leq \xi$. The concession made to France and Italy during June 2002, suggest that $\xi \approx 0.005$, or 0.5 percent of GDP.

¹¹ For the 11 EU members that formed the EMU on January 1, 1999, the 1992 figure debt ratio was 60.9 percent.

¹² See equation (14) below.

mind.¹³ A second possible explanation is based on the golden rule that is enshrined in the German constitution, according to which the public sector deficit is not to exceed (gross) public sector investment.¹⁴ In the twenty years preceding the Maastricht Pact, gross public investment in Germany averaged around 2.3% of GDP rising in some years as high as 2.7% of GDP.¹⁵ Gross public capital formation accounted for 3.1 % of GDP for the EU as a whole in 1992. Thus the three per cent ceiling is consistent with the history of the golden rule in Germany or its application to other EU member countries.

No economic argument has been offered for the requirement that the cyclically adjusted or medium-term general government budget be close to balance or in surplus.

Of the three numerical criteria, the debt criterion appears, based on the record thus far, to carry the least weight, both in the decision on whether a country can join EMU, or in the stability and convergence programmes that apply to all EU members.¹⁶

The differences between the accession countries and the current EU member countries become already apparent by comparing the economic variables that are subject to the Maastricht criteria. 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 Central and East European (CEE)

¹³ Using hindsight, the target inflation rate of the European Central Bank is below two percent per annum. This inflation rate is defined in terms of the Harmonised Index of Consumer Prices (HICP), but there is no reason to expect the inflation rate of the GDP deflator to be systematically different. The long-run growth rate of real GDP in the EU 15 is unlikely to be much more than 2.5 percent per annum.

¹⁴ The logic of the golden rule would suggest that only net, not gross investment should be financed by borrowing. Capital depreciation, or capital *consumption*, should, like other consumption, be financed out of current revenues.

¹⁵ The data are taken from the World Bank. Public Investment reached 2.7% of GDP in 1976 and was 2.4% in 1992, when the Maastricht Treaty was finalised.

¹⁶ At the end of 2000, the general government gross debt-GDP ratios for Belgium, Greece and Italy all were in excess of 100 percent. All three were declining, but none of them is likely to see 60 percent anytime soon.

accession candidates are given in Table 3. Table 4 gives the same information for the EU countries, the USA and Japan. Estimates of the cyclically adjusted general government deficits are not available for the ten CEE accession candidates.

TABLE 1 HERE

TABLE 2 HERE

TABLE 3 HERE

TABLE 4 HERE

Some features of these four Tables are perhaps surprising. From Tables 3 and 4 we see that the general government gross debt-to-GDP ratio is about twice as high for the existing EMU members as for the accession candidates. As regards the general government deficit-GDP ratios, the ranking is reversed. The eight Central Europe and the Baltics (CEB) early 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 three years, the eight CEB countries' average general government deficit has exceeded 3 percent of GDP. Poland, the Czech Republic and Hungary in particular are currently running large and, if we allow for the budgetary implications of accession, probably unsustainable general government deficits.¹⁷

Since it is the deficit criteria that are applied most strictly, these simple observations show that a major fiscal adjustment would be needed in the accession countries if they were required to meet the criteria in time for accession or soon afterwards. Given the further budgetary demands requirements that the 'Acquis' will make on these countries, this fiscal adjustment is not going to be easy, economically and politically. We argue in this paper that, depending on country-specific circumstances and structural economic features, some of the

¹⁷ In Poland, there is an important cyclical component to the increase in the general government financial deficit. Even there, however, any reasonable estimate of the structural deficit would show a disturbing increase.

fiscal adjustment implied by a mechanical application of the Pact's fiscal rules may be unnecessary, or even harmful.

Conflict about the timing and distribution of the pain of fiscal retrenchment is already at the forefront of the policy debates in the accession countries. In the Czech Republic, for instance, one of the main sticking points in the negotiations to build a coalition government has been the medium term prospects for the public finances. The Social Democrats appear to have won the argument for now, and an adjustment of the deficit to below three percent of GDP is not envisaged before the next election. The smaller coalition partners had fought hard to reduce the deficit to 3 percent of GDP by 2006, seen by some as the earliest technically possible entry date into the European Monetary Union, assuming EU accession occurs during 2004.

II. Some Simple Budgetary Arithmetic

Before going into the implications of the fiscal rules established by the Maastricht criteria and in the Stability and Growth Pact, we first establish formally the framework we are using.

The *fiscal-financial programme* of the state consists of the rules governing the sequences of past, current and future public spending (consumption, investment, transfer payments and subsidies), tax structures and revenues (rates, exemptions, bases, allowances, deductions etc.), subsidy and transfer structures, and government borrowing. Ideally the fiscal framework would also include the accounts of the central bank and such instruments as the issuance of base money. However, since the existing EU fiscal framework restricts its attention to the general government defined net of the central bank, we restrict our framework here to the general government as well. Including the central bank would in any case only be

important for countries that are not yet members of EMU and thus have independent monetary authorities, or to the EMU area as a whole.

To get a full and accurate picture of the sustainability of the public finances, it is important that *all* financial assets and liabilities (that is, all contractual claims and obligations) of the general government be included and consolidated in a single, comprehensive balance sheet, and that all non-contractual expenditures and receipts also be accounted for comprehensively and fully. All off-budget (contingent) expenditures and receipts (including the outlays and revenues of the state pension funds, the social security fund etc. and all off-balance sheet contingent claims and liabilities) must be consolidated and included in a single comprehensive set of accounts. Special purpose vehicles, off-balance sheet and off-budget constructions are as detrimental to fiscal transparency as they are to transparency in the private sector (*vide* Enron). Guarantees, whether explicit or implicit, should be 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; the imputation of a zero price is bound to be wrong most of the time.

For simplicity, we restrict the stylised accounting framework below to a single, (very) short maturity government debt instrument denominated in domestic currency. Generalisations to a range of debt instruments with different maturities, currency denominations, and methods for index-linking etc. are conceptually straightforward. The notation to be used in what follows is summarised in Table 5.

TABLE 5 HERE

Equation (4) is the budget identity of the general government. The change in the amount of nominal government debt (B) relative to nominal GDP (PY) is given by the primary deficit as a share of GDP ($g-\tau$) plus interest payments on existing government debt

measured as a share of GDP ($iB/(PY)$). Real GDP is denoted Y , the GDP deflator P and the short nominal interest rate on government debt i . A ‘dot’ over a variable denotes its instantaneous rate of change.

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

Using the definitions of Table 5, equations (4) can be rewritten as equations (5); b is (net) general government debt as a fraction of GDP, r is the short real rate of interest on general government debt, n is the growth rate of real GDP and π is the rate of inflation.

$$\dot{b} \equiv g - \tau + (r - n)b \quad (5)$$

The usual solvency constraints, ruling out Ponzi finance by the government, implies the following intertemporal budget constraint for the general government (equation (6)).¹⁸

$$b(t) \leq \int_t^{\infty} e^{-\int_t^v [r(u) - n(u)] du} [\tau(v) - g(v)] dv \quad (6)$$

The level of net debt has to be smaller than the present value of all future primary (non-interest) budget surpluses.¹⁹ Obviously current debt can be larger, for any given sequence of future primary surpluses as a proportion of GDP, if future growth rates of GDP are expected to be higher and future real interest rates lower.

For certain purposes, it is important to decompose total public spending, g , into general government *transfer payments*, g_T , general government *consumption*, g_C , and general government *gross capital formation*, g_I , that is,²⁰

¹⁸ The government is engaged in Ponzi finance if its debt grows forever at a proportional rate that is equal to or larger than the interest rate. In that case, despite having a positive debt stock outstanding, the government never plans to run any primary (non-interest) budget surpluses. Such public finance ‘pyramid schemes’ are ruled out here.

¹⁹ Equivalently, the current debt-GDP ratio has to be no larger than the sequence of future primary surplus-to-GDP ratios discounted at the real interest rate minus the real growth rate.

²⁰ Public sector transfer payments include all subsidies and social security (or national insurance) benefit payments, including state pension, health and disability benefits. Social

$$g \equiv g_T + g_C + g_I \quad (7)^{21}$$

Likewise it can be useful to decompose total current revenues into gross cash (that is, financial) returns to the government on the general government capital stock, θk , and other current revenues, τ_0 , where k is the public sector capital stock as a fraction of GDP and θ is the gross financial rate of return on the general government capital stock, that is:

$$\tau \equiv \tau_0 + \theta k \quad (8)^{22}$$

Let δ be the proportional rate of depreciation of the general government capital stock. The change in the public sector capital stock as a share of GDP, k , is given by the difference between the share of gross general government investment in GDP and the reduction in the public sector capital-GDP ratio due to capital depreciation and real GDP growth.

$$\dot{k} \equiv g_I - (\delta + n)k \quad (9)$$

For fast growing economies a higher investment rate is needed to maintain the ratio of the public sector capital stock to GDP.

Using the decompositions for government revenues and expenditure the general government budget identity can be written as follows:

$$\dot{b} - \dot{k} \equiv g_C + g_T - \tau_0 + (r - n)(b - k) - (\theta - \delta - r)k \quad (10)$$

After introducing the accounting framework we can now state the deficit criterion of the Maastricht Treaty and the cyclically adjusted deficit criterion as follows:

$$\eta \equiv \frac{\dot{B}}{PY} \equiv g - \tau + ib \leq 0.03 \quad (11)$$

$$\tilde{\eta} \equiv \tilde{g} - \tilde{\tau} + \tilde{i}\tilde{b} \leq 0 \quad (12)$$

security (or national insurance) taxes or contributions are included among the taxes in the accounts.

²¹ All public spending categories, g , g_C , g_I and g_T , are measured as shares of current GDP.

‘Excessive’ debt is a broader concept than ‘unsustainable’ debt. 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 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. The question is whether debt and deficit ceilings that are the same for all countries, regardless of their economic structures and circumstances, are excessively blunt instruments for addressing the issue of sovereign insolvency or default, and *a-fortiori* 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.²³ A fiscal-financial programme is sustainable if it ensures the solvency of the government. Consider again the fundamental solvency constraint of the government in equation (6). We shall rewrite that solvency constraint in an equivalent but presentationally more transparent form by replacing the driving economic parameters by ‘permanent’ values. These are constant values that can be thought of as long-run average future values. This can be done without loss of generality by choosing the constants carefully (see Appendix 1). For instance, the permanent primary general government surplus (as a share of GDP) is that constant share of the general government primary surplus in GDP whose present discounted value over the relevant future time horizon (which could be infinite) is the same as the present discounted value of the general government primary surplus share in GDP that one

²² Again, τ , τ_0 and k are measured as shares of current GDP.

²³ One can weaken this to the requirement that default risk be below some threshold level.

actually expects or plans to occur over that future period.²⁴ We denote these constant or permanent values by a superscript p .

Making use of the permanent spending ratios, revenue ratios, real interest rates and real growth rates, the government's intertemporal budget constraint or solvency constraint (6) can be written compactly as follows:

$$b \leq \frac{s^p}{r^p - n^p} \equiv \frac{\tau^p - g^p}{r^p - n^p} \equiv \frac{\tau_0^p + \theta^p k^p - g_I^p - g_C^p - g_I^p}{r^p - n^p} \quad (13)$$

Government solvency can therefore be seen to depend on four crucial parameters: b , the outstanding (net) 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 by history, 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.

Somehow surprisingly, of the four crucial parameters governing government solvency, three do not figure in any of the three deficit and debt criteria. These are the primary surplus-to-GDP-ratio, the long-run real interest rate and the long-run real growth rate. The fourth, the (net) 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. The Maastricht debt criterion involves the *gross* debt-to-GDP-ratio. In what follows we shall assume that gross and net government debt coincide.²⁵

²⁴ Since we are dealing with spending flows as proportions of GDP, the relevant discount factors are real interest rate minus real growth factors.

²⁵ 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

Instead of the primary deficit s , the real interest r and the real growth rate n , the Maastricht Criteria involve the full government deficit η . Since these are related, the deficit criterion puts some restrictions on sustainability but does so in a very crude way.

Note that:

$$\begin{aligned}\dot{b} &\equiv \eta - (\pi + n)b \\ &\equiv -s + (r - n)b\end{aligned}\tag{14}^{26}$$

The first line of equation (14) 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 (14) 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 (14). The general government financial deficit-to-GDP ratio is constrained by the cyclically adjusted deficit criterion and the deficit criterion. Comparing the behaviour of two national economies with the same outstanding debt-to-GDP ratio and subject to the same binding deficit constraint²⁷, 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 and require a tighter, more restrictive stance of fiscal policy. Below we consider whether, *cet. par.*, a higher rate of nominal income growth

makes little economic sense. This distinction is not just academic as the case of Japan demonstrates, where gross debt exceeds net debt according to some estimates by almost 100 %.

²⁶ If the government has issued foreign-currency bonds paying an interest rate i^* , equation (14) becomes: $\dot{b} \equiv \eta - (\pi + n)b + \varepsilon\alpha b \equiv -s + (r - n)b + (i^* + \varepsilon - i)\alpha b$. Here b is total (domestic and foreign currency denominated) general government debt as a fraction of GDP, i^* is the short foreign nominal interest rate, α is the share of foreign currency debt in total general government debt and ε is the proportional rate of depreciation of the nominal exchange rate. Similar generalisations are easily constructed when index-linked debt is present.

²⁷ Either the Stability and Growth Pact constraint or the Maastricht constraint.

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 $\pi + n$. If 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 cyclically adjusted deficit criterion is observed, the first line of equation (14) shows that the net debt to GDP ratio will, on average, decline and in due course become zero or negative.

For any given value of $r^p - n^p$ it therefore follows from equation (13) 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, $b < 0$). This suggests that, if the cyclically adjusted deficit criterion is 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 deficit criteria will ensure government solvency.

III. Excessive Deficits.

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 not 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 does not appear to be motivated primarily by a technical economic judgement about asymmetries in the

transmission mechanism of fiscal policy.²⁸ Instead, the asymmetry 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.

The political economy case for a bias towards excessive deficits is by no means overwhelming, either as theory or as empirics (see e.g. Roubini and Sachs [1989], Grilli, Masciandaro and Tabellini [1991], Alesina and Perotti [1995], Alesina, Perotti and Tavares [1998], De Haan, Moessen and Volkering [1999], Hallerberg and von Hagen [1999] and Velasco [1999]). Much of the theoretical work cited in support of the proposition that there is a bias towards excessive deficits 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.²⁹

One straightforward theoretical model of a bias towards excessive deficits views delayed fiscal adjustment as the outcome of a 'war of attrition' between organised interest groups that try to shift the burden of fiscal adjustment (tax increases or spending cuts) onto other interest groups. Another approach views the use of debt issuance as an instrument of control by an incumbent government over its successor, when partisan governments alternate in office.

Consider for instance the case where all taxes are distortionary and/or costly to collect. There are two kinds of governments, possibly representing two different political

²⁸ The only self-evident asymmetry in the response of the economic system to very high public debt and very low debt (or very large negative debt), comes from default risk and the real cost associated with government debt default. There is no counterpart to bankruptcy and default for economic agents, including governments, that are very large ('excessive') creditors. However, for every creditor there is a matching debtor. Lower government debt means either lower domestic private financial wealth and/or lower foreign financial wealth. Private default is costly also.

²⁹ For two outstanding treatises that include comprehensive surveys of this literature, see Drazen [2000] and Persson and Tabellini [2000].

parties. The frugal government favours low public spending and low taxes (now and in the future). The spendthrift government favours high public spending and high taxes (now and in the future). A government's tenure is uncertain. There is a non-negligible risk that this period's government will not be the same as next period's government. Under these conditions, a frugal government may choose to borrow rather than to tax, leaving the successor government (which could be spendthrift) a higher debt burden that will constrain its ability to engage in high public spending.

Whatever one may think of the plausibility of these and similar political economy models of the endogenous determination of government deficits, they do not address the issue of cross-border externalities of (excessive) government debt and deficits. Presumably it is the presence of such cross-border externalities that motivates the fiscal constraints of the Stability and Growth Pact and the Maastricht Treaty - constraints imposed on national governments by a supranational Treaty and its enforcement by a supranational set of institutions. The Stability and Growth Pact and Treaty fiscal constraints. We now turn to the consideration of such cross-border externalities.

III.1. A bias towards excessive deficits: free rider problems among national budgetary authorities.

A case can be made that implicit or explicit guarantees by the EMU area member countries of each other's public debt could give rise towards a bias towards inflated budget deficits. Suppose one country's government runs deficits that are unsustainable in the long run. Without any guarantee from other EMU member countries, financial markets would raise the default risk premium on the debt issued by the government of the country in question. If this debt were to keep on growing, domestic and international financial markets would ultimately impose *de-facto* credit rationing on the country. The cost of higher default

risk premia and the threat of being frozen out of international markets will restrain the debt issuance process.

With an implicit or explicit guarantee by the governments of other EMU member countries, the default risk premia on the public debt of each member country would not reflect the risk of default by each individual borrowing country but only the risk of default of the EMU area governments collectively. Thus, any explicit or implicit guarantee would give rise to an externality that could lead to a bias towards excessive budget deficits.

Why would the government of one E(M)U country (say country A) provide an implicit or explicit guarantee, free of charge, for another country's (say country B's) public debt? In the first instance, that is, at given E(M)U-wide prices and levels of economic activity, default on country B's public debt represents a distributional conflict between the owners of that debt, country B's tax payers and country B's beneficiaries from public spending. Unless the government of country A is motivated by empathy towards foreign savers, foreign tax payers or foreign beneficiaries of foreign public spending, it is only likely to respond to the threat of country B's public debt default if country A's holders of country B's public debt would themselves be threatened with insolvency and bankruptcy should country B's public debt go into default. Even then, a policy response from country A would only be forthcoming if either there would be systemic financial stability implications for country A from the country B's debt default or if there would be unacceptable hardship for some of country A's holders of country B's public debt.

The obvious response to this possibility is, however, not the promise of a fiscal bailout of country B's government by country A's government, but a regulatory and supervisory response by the government of country A. Domestic financial institutions and other domestic holders of foreign public debt in country A that are of systemic significance, should not be allowed to hold excessively concentrated portfolios, but should be required to

limit their exposure to any single borrower, public or private and to hold well-diversified portfolios. Financial hardship concerns for country A's holders of country B's public debt should be dealt with through the normal, existing fiscal mechanisms and social safety nets in country A.

Implicit guarantees of other countries' public debt clearly not only exist in theory. Both in 1982 and in 1995 the US treasury made substantial funds available to help Mexico handle its debt crises. While there might have been some altruistic motives, the main reason why the US was prepared to step in was to dampen the impact of the crises on the US financial system, which was a major creditor to Mexico. In both instances the US government extended its funds to the Mexican government rather than to its domestic financial institutions, perhaps because an indirect bail-out of the domestic financial sector by means of a bail-out of the government of a (relatively) poor country, is more politically acceptable than a direct bailout of the domestic financial sector.³⁰

Even if all of country B's public debt is held by its own residents, and there is therefore no *direct* trans-boundary effect from a debt default by the government of country B, other countries can be affected through the impact of country B's public debt default on E(M)U wide prices (including interest rates and other financial asset prices) and levels of economic activity. If this international transmission occurs through prices set in competitive markets, the externalities involved are purely pecuniary, and there are no efficiency issues involved (see Buiters and Kletzer [1991a,b]).³¹ Where international transmission occurs through imperfectly competitive markets or through other rationing mechanisms, the external consequences of country B's public debt default will in general raise efficiency issues for country A, and some policy response from country A is appropriate. It is not at all clear,

³⁰ The ultimate incidence of the bailout may, however, be very similar for the direct and indirect bail-out mechanisms.

however, that the optimal response (either from country A's perspective or from the point of view of the system as a whole) would be for country A to guarantee country B's debt. A domestic fiscal response in country A to a weakening of demand from country B in the event of a public debt default in country B may well dominate a bail-out of country B's fiscal authorities by the government of country A.

Closer economic linkages among the countries in the E(M)U would strengthen the transmission of the shock of one country's default to other member countries. If stronger spillovers strengthen the incentive for member countries to bail out other member countries, the value of the implicit guarantee would rise. Note, however, that this implicit guarantee in principle does not stem from being in a monetary union like EMU, but rather depends on the strength of underlying economic linkages. Only when and to the extent that EMU deepens the integration of the economies, does it raise the value of any implicit guarantee.

Finally, international transmission can occur through pure or blind 'contagion effects', where risk premia on the debt of country A's public debt move in line with those on country B's public debt, even though the fundamentals for country A's public debt are much stronger (and are known to be much stronger) than those for country B's. Such blind contagion, if it occurs at all, appears to be a rare event. The recent financial crises in Turkey and Argentina have been noticeable for the almost complete absence of blind contagion.

If there is a free rider problem, the solution is self-evident and can be found in the Treaty. European institutions are banned from bailing out member states' governments (at all levels). Neither the Maastricht criteria nor the Stability and Growth Pact make any provisions for cross country guarantees among governments, nor do they rule them out. Legally, nothing can stop one sovereign nation's government from bailing out another sovereign nation's government. In principle, there could be an implicit guarantee with

³¹ There will be distributional consequences from changes in competitive market prices.

associated free-rider effects leading to excessive deficits. In practice, however, the likelihood of, say, the UK bailing out the Italian fiscal authorities because of a concern about the level of the Italian public debt or Italy's unfunded implicit public pension liabilities is probably similar to the likelihood of Italy bailing out the UK's fiscal authorities because of a concern about the UK's unfunded implicit National Health Service liabilities or about the implicit liability represented by the UK's unfunded infrastructure investment programme.

III.2. A bias towards excessive deficits: free riding on the ECB

A second cross-boundary externalities argument for a tendency towards excessive government deficits is based on the response of the ECB to the threat of default by an EMU member government or, more generally, the perception of the ECB's response to the pursuit of excessively expansionary fiscal policy by member governments.

As regards the threat of default, the mechanism is the same as in the previous section. If the ECB attaches value to the prevention of sovereign default (or to the mitigation of the consequences of a sovereign default), the markets will anticipate that, at some point, rather than enduring (or even just risking) a national sovereign default, the ECB will monetise some or all of the public debt issued by a fiscally lax national authority. It is as if the ECB implicitly guarantees the public debt of the national authorities.

The Treaty explicitly forbids the ECB (and the National Central Banks that, together with the ECB constitute the European System of Central Banks (ESCB)) from extending credit directly to any national authority (at any level of government), or indeed to any other public body. However, this does not eliminate or even diminish to any appreciable extent, the ability of the ESCB to monetise public sector deficits and outstanding stocks of public debt. The reason is that, while the Treaty bans the ECB and the ESCB from the primary

These may be of concern to the authorities.

issues market for public debt instruments, the ESCB has the public debt of all EMU member states on its balance sheet and can freely conduct open market operations in the secondary markets for public debt instruments.

Thus, through open market purchases (in the secondary markets) of the public debt of any EMU member government, the ECB/ESCB has the technical and legal capacity to monetise any EMU member's public debt and deficit. Whether the ECB will do so depends both on the way it trades off price stability against default risk and other desiderata, and on its ability to commit itself to a pre-announced future course of action. Note that this mechanism for a bias towards excessive debt and deficits is present even if the monetary authority faces but a single fiscal authority. It does not require multiple fiscal authorities for any one fiscal authority to be able to free ride on the ECB.

As regards the objectives of the ECB, it is clear that the primary, overriding objective is price stability. If this means that the ordering of the price stability objective and all other objectives, such as financial stability, employment, growth etc., is *lexicographic*, then the capacity of national fiscal authorities to induce the ECB to (implicitly) guarantee their debt, vanishes. If the priority attached to price stability is high but not absolute, some tendency towards excessive deficits can still be present.

Another mechanism for generating a bias towards excessive deficits through the interaction of the central bank and the fiscal authorities can operate even if there is no default risk that the fiscal authorities can use to put pressure on the central bank. The mechanism works even if price stability is the only thing the central bank cares about. It does, however, require that there be more than one national fiscal authority.

Consider a national fiscal authority who is part of a monetary union, and dislikes inflation but likes a higher level of economic activity in his own country. In the monetary union, there is a common rate of inflation. In the short run, EMU-wide inflation is driven by

all the output gaps in the union as a whole. Each country's contribution to the common inflation rate is therefore scaled by that country's size (say GDP) relative to the size of the Union as a whole. Assume that effective demand for a country's output and, in the short run, real economic activity in a country, can be boosted by using domestic expansionary fiscal policy.³² More expansionary fiscal policy is identified with larger budget deficits³³. When expansionary fiscal policy in country B, say, raises output in country B, and inflation in the EMU area as a whole, the central bank will tighten monetary policy uniformly in the union as a whole. Part of the unemployment and output cost of the higher inflationary pressures created by country B's expansionary fiscal policy is therefore borne by the other EMU members. Each country's fiscal authority can free ride on the other EMU members, through the ECB's anti-inflationary policy. There is a bias towards excessive domestic demand stimuli, which, with some hand waving, is then identified with excessive fiscal deficits.

While this mechanism, or something like it, may well be at work in EMU, its practical significance is unknown. The effect of fiscal expansions on demand is far from clear, especially in countries that are highly indebted. Some of the major fiscal consolidations in Europe in the 80's and 90's may well have boosted output rather than reduced it. Furthermore, even if a fiscal expansion raises output, with a common currency its spillovers on foreign production are likely to be positive. Thus, they do not only raise domestic demand but also foreign demand, which reduces the magnitude of the externality.

In practice, the evidence for a bias towards excessive deficits in Europe is thin. 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 externally

³² For simplicity, assume that the fiscal expansion is through increased spending on non-traded goods only. Trans-border demand spillovers therefore occur only through the effect of domestic fiscal policy on domestic economic activity and thus on import demand.

³³ This literature is extremely sloppy and hand-waving. A larger government deficit is, in general, neither necessary nor sufficient for budgetary policy to boost demand.

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 about 40 percent of annual GDP. Virtually all of this decline occurred without the benefit of externally imposed debt or deficit ceilings.

IV. The Stability and Growth Pact and Counter-cyclical Stabilisation Policy

The Stability and Growth Pact can interfere with national fiscal stabilisation policy if the numerical constraints of the Pact are binding on a national fiscal authority. Under those circumstances it is not possible to let the automatic fiscal stabilisers operate as they should when 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 a slowdown in economic activity.

Of course, a country can reduce the risk of the deficit limits becoming binding constraints by positioning its budgetary stance in such a way that, over the cycle, it runs a sufficiently large surplus to ensure that the likelihood of hitting the deficit ceiling becomes arbitrarily low. The automatic stabilisers could then operate freely, even during a downturn (see e.g. Dalsgaard and DeSerres [1999]). 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. Moving to a position of a cyclically adjusted budget surplus large enough to reduce to an acceptable level the risk of hitting the deficit limits during a

downturn, would involve a process of fiscal tightening, which would involve short-term economic costs.

As regards the long-run problem, the implication of a government budget that is sufficiently in surplus over the cycle to minimise the risk of hitting the deficit ceilings could be a long-run negative government debt position. We shall discuss some aspects of the 'creditor state' in Section V below.

Keynesian arguments for counter-cyclical government deficits rest on the assumption that some private agents are liquidity-constrained and/or constrained in their current spending not just by their permanent income but also by their current disposable income, while other private agents continue to be willing and able to absorb additional public debt. Under these conditions, deficit financing by the government during a downturn can stimulate aggregate demand, even if it is recognised by all that the newly issued debt (inclusive of interest) will be retired again during the next upswing.

Similar counter-cyclical behaviour of the government deficit follows from some neoclassical theories of the optimal use of distortionary taxes. These imply that, faced with temporary variations in public spending or in the tax base, public sector deficits and surpluses should be used to smooth distortionary taxes over time and thus to minimise 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 neoclassical approach to optimal government deficits and debt points to the need to distinguish between temporary or transitory and permanent or persistent changes in public spending and revenues in general. Cyclical variations in deficits due to the operation of the automatic fiscal stabilisers are just one example of temporary variations in revenues and spending. We expand on this when we propose our own fiscal rule in Section VIII below (see also van den Noord [2000]).

V. The Long-Run Implications of the Stability and Growth Pact

A straightforward but nevertheless startling implication of adherence to the Stability and Growth Pact is that it will cause the eventual amortisation of all general government debt and the possible 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. As regards the cyclically adjusted budget, we assume that ‘close to balance or in surplus’ means that, in the long run, the public sector financial deficit is non-positive: $\bar{\eta} \leq 0$, where overbars are used to indicate steady-state values. This means that the long-run stock of government debt is either zero or negative, as long as the long-run growth rate of nominal GDP is positive.

$$\bar{b} \equiv \frac{\bar{\eta}}{\bar{\pi} + \bar{n}} \leq 0 \text{ if } \bar{\eta} \leq 0 \text{ and } \bar{\pi} + \bar{n} > 0 \quad (15)$$

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

$$\bar{b} = \frac{-\bar{g}}{\bar{r} - \bar{n}} < 0 \text{ if } \bar{r} > \bar{n} \text{ and } \bar{g} > 0 \quad (16)$$

In this rarefied universe, 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 in steady state.

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.

An obvious political economy problem with the conclusion that the optimal tax rate on augmentable capital is extremely high in the short run and zero in the long run, is that it assumes that the government can credibly commit itself to such a policy. At any given point of time, the fiscal authorities are in the 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 of the value of 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. 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.

VI. Co-ordination of National Fiscal Stabilisation Policies.

In any economy which has nominal rigidities in price and/or wage setting and which does not exhibit Ricardian equivalence or debt neutrality, there is a need for the coordination of fiscal and monetary stabilisation policy. While there have been some attempts to address fiscal incentives and tax administration-related issues (such as state aid, tax competition and the taxation of savings) at the level of the EU as a whole, there is no institutional mechanism or policy framework in the EU for co-ordinating 15 national fiscal stabilisation policies (let alone for co-ordinating 15 national fiscal stabilisation policies and four monetary policies). Likewise, there exists no institutional mechanism or policy framework today in the EMU for co-ordinating the 12 national fiscal stabilisation policies of its members, or for co-ordinating these 12 national fiscal stabilisation policies with the EMU-wide monetary policy determined by the ECB.

Each EU member state draws up a Stability Programme or a Convergence Programme, which is updated yearly. These programmes are considered by the Commission and Council through a system of '*multilateral surveillance*' designed to ensure consistency with the guidelines and the proper functioning of EMU. This surveillance process provides an early warning system under which the Council can issue a recommendation for actions by

the member state to remedy the difficulties identified. In principle, this multilateral surveillance system, required by the Treaty, has a very wide scope. In practice, however, it has focused on fiscal issues, supplementing the Stability and Growth Pact and the excessive deficit procedure. No pecuniary or other tangible sanctions are imposed if a member state does not follow the Council's recommendation

The available material on economic policy co-ordination in the EU does not contain evidence of efforts at macroeconomic policy co-ordination at the level of the E(M)U area as a whole.^{34 35} 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 other individual 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 EMU area-wide developments or on the budgetary policy actions of other individual EMU countries. Nor is any attention paid to whether the entire 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 reference to whether the sum of the national parts makes sense for the region as a whole.³⁶ Macroeconomic policy co-ordination in the E(M)U, other than the systematic exchange of relevant information, is clearly still at the pre-embryonic stage.

³⁴ <http://ue.eu.int/emu/en/index.htm>.

³⁵ See Appendix 1 for the text of the '*Resolution of the European Council on the Stability and Growth Pact*'. See also European Commission [2001b] and European Central Bank [1999], pp. 62-72.

VII. Different Economic Realities Meet the Stability and Growth Pact.

VII.1. 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. In this Section we argue that the existing fiscal rules are ill equipped to deal with the increasing economic diversity of EU member countries. This is true both because of a different status quo or set of initial conditions (e.g. different debt to GDP ratio, public capital stocks) and because of differences in likely future economic developments (e.g. growth rates, real exchange rate appreciation rates).

VII.1A. 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 1999, 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.

³⁶ In addition to this rudimentary multilateral surveillance mechanism, there is a similar system of guidelines and information exchange for employment policy.

TABLE 6 HERE

Following accession, there is likely to be a convergence process, taking many decades for most candidates, during which real GDP growth in these East and Central European countries systematically exceeds that in the rest of the EU.³⁷ 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 1.3% higher than the growth rate of the current EU average.³⁸ For Poland, the annual growth rate differential would have to be 4.0% if catch-up is to occur in 25 years. If catch-up takes 50 years for Poland, the annual growth rate differential would come down to 2.0%.

Aggregate productivity growth differentials are likely to be similar to aggregate output growth differentials, because the demographics of the existing E(M)U members are 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. The catch up will also result in appreciating real currencies in the accession countries as we argue in the next section.

Table 7 here

VII.1B. 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

³⁷ See Crespo-Cuaresma et. al. [2002] for evidence that integrating the accession candidates in the EU may provide a further boost to their growth rates.

exchange rate, this means that the inflation rate in the accession countries is likely to exceed that in the existing EU members.³⁹ This difference could, for several decades, easily amount to 1.5 to 2 percent per annum.

Suppose that the exchange rate of an accession country is fixed against the Euro. Under reasonable assumptions, the difference between the aggregate inflation rates in an accession country and in the E(M)U equals 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 (see Appendix 2). 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. This is because productivity catch-up is likely to be faster in the industrial sector, which produces mostly tradables 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

³⁸ We assume for simplicity that the growth rate differential is constant during the catching up period.

³⁹ The accession countries could, following EU accession, choose to let their currencies appreciate vis-à-vis the currencies of the existing EU members. Elsewhere we have argued (see Buiters and Grafe [2002]), that, provided fiscal sustainability is ensured, 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. Two of the current crop of early accession candidates, Estonia and Lithuania, already have currency boards with the euro. It would make no sense to replace this with a looser peg for a short period prior to EMU membership.

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.

In a paper prepared by the CEC5 National Banks [2002], a range of ‘guestimates’ of the Balassa-Samuelson effect for these 5 advanced accession candidates is presented.⁴⁰ They range from a low of 0.8 percent per annum for Slovenia (1993-1999), to 1 to 2 percent per annum for Slovakia (with 3 percent per annum deemed a possibility in the future), 1.2 to 1.5 percent per annum for Poland, 1.9 percent per annum for Hungary and 1.6 percent per annum for the Czech Republic.

All these estimates have the obvious shortcoming that they are based 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

⁴⁰ The CEC5 countries are Czech Republic, Hungary, Poland, Slovakia and Slovenia.

annum. Thus, at constant exchange rates, this appreciation would raise annual inflation rates in accession countries by about 1.5-2.5% compared to those in the EMU area.

This has important implications for real interest rates. Suppose the peg of the currency to the Euro is perfectly credible. International financial mobility would then imply that the risk free nominal interest rate in the accession countries would be the same as in the current EMU area. Given that inflation rates are likely to be higher in the accession countries, real interest rates there will be lower than in the existing EMU area and hence the real cost of public debt in these countries is likely to be lower for a given debt level.

VII.1C. Implications of the real appreciation and higher real growth rates for debt sustainability.

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. In Section II we showed that a country remains solvent as long as the solvency constraint in equation (13) is satisfied.

The first line of equation (14), $\dot{b} \equiv \eta - (\pi + n)b$, shows that, for any given ratio of outstanding government debt to GDP ratio, b , a higher growth rate of nominal income, $\pi + n$, makes a higher government deficit-GDP ratio, η , sustainable, in the (loose) sense that the same future behaviour of the government debt-GDP ratio is implied. Conversely, for any given 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 of the Pact allow for these obvious, persistent structural differences.

Rather than focusing on the general government financial deficit-GDP ratio, which is not very informative from the point of view of government solvency and debt sustainability (because *nominal* interest payments are included in it), we shall approach the fiscal

sustainability issue using the fundamental determinants of government solvency, the (net) 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. We have argued above that 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. 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 automatically compromising fiscal sustainability.

This conclusion could be reversed if the maintained assumption of the thought experiment in the last paragraph – that, following accession, existing E(M)U members and current accession candidates do not differ in their ability and willingness to run primary surpluses – is not justified. It could be that the ability/willingness 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. In view of the demands that will be placed 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.

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 a somewhat larger 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 in government debt-GDP and government deficit-GDP ceilings among countries. 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 deficit criterion and cyclically adjusted deficit criterion involve uniform deficit-to-GDP ceilings across countries. Information that is highly valuable for an accurate assessment of public debt sustainability is ignored.

VII.2. The Stability and Growth Pact and Public Sector Investment.

The Stability and Growth Pact criteria do not allow for differences between current spending and general government capital formation. Both the existing capital stock and spending on public capital formation varies widely across countries. Unfortunately data on the value of the existing public sector capital is hard to come by. Table 8 shows gross capital spending by general governments for accession countries and existing EU member countries. The variation is large inside the existing EU, but even more so with respect to the accession countries. While Greece was spending 4.1% of its GDP on public capital formation, Britain was spending as little as 1.4%. In contrast, the accession countries were spending on average 3.9% of GDP on public capital formation with the Czech Republic spending as much as 5.9% of GDP. Given the state of public infrastructure in accession countries and the requirements

put on it by the Acquis and by the need to catch up with the more advanced Western European economies, the differences are unlikely to decline in the near future. Thus, the IMF expects public spending on capital formation to account for about 4.3% of GDP until 2005 and it is not going to decline substantially for the rest of the decade. In effect this means that all the accession countries would have to run a surplus net of investment of 4.3% if they were obliged to reach a cyclically balanced budget in order to meet the requirements of the Stability Pact. This is clearly a tall order. That is why it should not have come as a surprise that the current Czech government coalition has not to try to meet the requirements of the Stability Pact and of the Treaty before 2007, even if this jeopardises early entry into the European Monetary Union.

Table 8 here

In the UK, one of the principles governing the fiscal-financial programme is the ‘cyclically adjusted golden rule’ (see Buiter [2001] and Kell [2001]). According to this rule, on a cyclically adjusted basis, government borrowing should not exceed government capital formation. In the ‘net’ capital formation version of the golden rule, this implies:

$$\tilde{\eta} \equiv \tilde{b} + (\tilde{\pi} + \tilde{n})\tilde{b} \leq \tilde{g}_I - \tilde{\delta}\tilde{k} \equiv \tilde{k} + \tilde{n}\tilde{k} \quad (17)^{41}$$

Note that the government’s budget identity can be written as

$$\dot{b} \equiv (g_C + g_T + \delta k - \tau_0 - \theta k + ib) + g_I - \delta k - (\pi + n)b \quad (18)$$

Thus the *cyclically adjusted golden rule* implies for current expenditures and revenues that:⁴²

⁴¹ The ‘gross’ capital formation version of the golden rule would be

$$\tilde{\eta} \equiv \tilde{b} + (\tilde{\pi} + \tilde{n})\tilde{b} \leq \tilde{g}_I \equiv \tilde{k} + \tilde{\delta}\tilde{k} + \tilde{n}\tilde{k} .$$

⁴² Depreciation, that is, capital consumption, is counted as current expenditure.

$$\tilde{g}_c + \tilde{g}_T + \tilde{\delta}\tilde{k} - \tilde{\tau}_0 - \tilde{\theta}\tilde{k} + \tilde{i}\tilde{b} \leq 0 \quad (19)^{43}$$

There are two aspects of this rule that give grounds for concern. First, the nominal amount that can be borrowed for investment is independent of the rate of inflation, or more precisely, independent of the reduction in the real value of the outstanding stock of domestic-currency-denominated government interest-bearing debt brought about by inflation. Inflation (when it is anticipated) increases the nominal interest rate on the (domestic-currency-denominated) public debt and through that the financial deficit of the government. The higher nominal interest payments are, however, compensated for, as regards the sustainability of the government's fiscal-financial programme, by the reduction in the real value of the domestic currency-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.

The second obvious flaw of the cyclically adjusted 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. On the other hand, a higher rate growth rate calls for a higher rate of investment simply to sustain the capital-output ratio.

This suggests that an *inflation-and-real-growth-adjusted and cyclically-adjusted golden rule* may be a better guide to sustainable public sector financing. It is given in equation (20):

$$\tilde{g}_c + \tilde{g}_T + \tilde{\delta}\tilde{k} - \tilde{\tau}_0 - \tilde{\theta}\tilde{k} + (\tilde{r} - \tilde{n})\tilde{b} + \tilde{n}\tilde{k} \equiv \tilde{b} - \tilde{k} \leq 0 \quad (20)$$

⁴³ The corresponding constraint for the 'gross' version of the golden rule would be $\tilde{g}_c + \tilde{g}_T - \tilde{\tau}_0 - \tilde{\theta}\tilde{k} + \tilde{i}\tilde{b} \leq 0$, which is of course less restrictive than (19).

For the general government deficit as a share of GDP this implies that

$$\tilde{\eta} \leq \tilde{g}^I - (\tilde{\delta} + \tilde{n})\tilde{k} + (\tilde{\pi} + \tilde{n})\tilde{b} \equiv \tilde{k} + (\tilde{n} + \tilde{\pi})\tilde{b} \quad (21)$$

Thus, under the cyclically adjusted and inflation-and-real-growth-adjusted golden rule, the government's stock of net liabilities, $b - k$, 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 (or freeing up) 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 two variants of the golden rule in some greater detail, under two extreme assumptions about the financial (cash) returns to the government from the public sector capital stock.

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

Consider as the first benchmark the case where the net financial (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:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_C + \tilde{g}_T - \tilde{\tau}_0 + (\tilde{r} - \tilde{n})(\tilde{b} - \tilde{k}) \quad (22)$$

Under the *cyclically adjusted and inflation-and-real-growth-adjusted golden rule*, given in (20) or (21), the evolution of government net assets is government by:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_C + \tilde{g}_T - \tilde{\tau}_0 + (\tilde{r} - \tilde{n})(\tilde{b} - \tilde{k}) \leq 0 \quad (23)$$

When public sector capital earns a net financial rate of return equal to the government's cost of borrowing, government capital formation is, from a financial or cash-flow point of view, exactly the opposite of government borrowing; it amounts to government debt repayment. The cyclically adjusted, inflation-and-real-growth-adjusted golden rule is

clearly conservative in this case, as the value of the government's net liabilities at current reproduction cost (that is, government financial debt minus government capital valued at current reproduction cost) is the same as the value of the government's net liabilities 'marked to market', that is, with capital valued at the present discounted value of future net financial returns.

If the inflation rate is positive and the stock of government financial debt is positive, the *cyclically adjusted golden rule* itself would be more conservative. Under this rule we would have:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_c + \tilde{g}_T - \tilde{\tau}_0 + (\tilde{r} - \tilde{n})(\tilde{b} - \tilde{k}) \leq -\tilde{n}(\tilde{b} - \tilde{k}) - \tilde{\pi}\tilde{b} \quad (24)$$

Obviously, the Stability and Growth Pact rule that the cyclically adjusted budget deficit be non-positive is tighter than the cyclically adjusted golden rule whenever net public sector capital formation is positive.

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, gross public sector capital formation is equivalent to government consumption.

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

$$\begin{aligned} \tilde{\eta} &\equiv \tilde{g}_c + \tilde{g}_I + \tilde{g}_T - \tilde{\tau}_0 + \tilde{i}\tilde{b} \\ &\equiv \tilde{g}_c + \tilde{\delta}\tilde{k} + \tilde{g}_T - \tilde{\tau}_0 + \tilde{i}\tilde{b} + \tilde{k} + \tilde{n}\tilde{k} \leq 0 \end{aligned} \quad (25)$$

The cyclically-adjusted golden rule for this case is

$$\tilde{g}_c + \tilde{\delta}\tilde{k} + \tilde{g}_T - \tilde{\tau}_0 + \tilde{i}\tilde{b} \leq 0 \quad (26)$$

The cyclically adjusted and inflation- and real-growth-adjusted golden rule for this case becomes:

$$\tilde{b} - \tilde{k} \equiv \tilde{g}_C + \tilde{g}_T - \tilde{\tau}_0 + (\tilde{r} - \tilde{n})(\tilde{b} - \tilde{k}) + (\tilde{r} + \tilde{\delta})\tilde{k} \leq 0 \quad (27)$$

Comparing (27) with (23), we see that the absence of any financial returns on the government capital stock puts a squeeze on government consumption, transfer payments permitted and tax receipts required under the rule. 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 $-\delta < 0$.

If public sector investment does not yield any cash income, it should be treated as consumption for the purpose of prudent financial management. The fact that public sector capital may not yield any financial returns does *not* mean that one should never borrow to finance public sector investment, or that one should not borrow to finance public sector capital formation on a cyclically adjusted basis. It does mean that *any* increase in public investment spending (like any increase in any other category of public spending) should be matched by an increase in current and future taxes or other public revenues, or by a reduction in other categories of current and future public spending, of equal present discounted value.

It is important to realise that, even when 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, and inflation-and-real-growth-adjusted government budget) should always be balanced or in surplus. The reason is that fiscal sustainability does not require that government consumption spending (even cyclically adjusted) should always be financed out of current receipts rather than by borrowing. The ultimate, fundamental rationale for all borrowing is *consumption* smoothing over time. From an economic perspective, investment is just a round-about or indirect way of intertemporal consumption smoothing.

The cyclically, inflation- and real-growth-adjusted golden rule marks a few tentative steps on the road towards a robust government borrowing rule. It fails to recognise, however, that there are many causes for variations over time in government spending and receipts, and that the business cycle is but one possible cause. War-related expenditures come to mind, as do enhanced public sector investment programmes motivated by capital-poor initial conditions, that is, by an inadequate or substandard public sector capital stock.

Such is the case in the UK, where the general government capital stock has been allowed, over a period of many decades, to depreciate and decline to an extent that is unprecedented in advanced industrial societies. The initial phase of a major programme of catch-up public sector investment is finally getting under way. In the next Section, we will argue that borrowing makes sense when there is an excess of actual public sector investment over 'permanent' public investment. 'Temporary', may however, refer to a period of ten or fifteen years in some cases.

VII.3 General Government Spending on Pensions

All current EU member countries as well as the accession countries have traditionally relied on pay-as-you go state pension systems to secure retirement income for the old. These programmes were relatively easy to operate, politically, as long as younger generations were outnumbering the older ones. With falling fertility rates and rising life expectancy, and (in most of the continental EU members) disappointing productivity growth, securing retirement by intergenerational transfers from the working population to the retirees is becoming increasingly difficult. The expectations of past contributors (current beneficiaries) are no longer consistent with the expectations of current contributors (future beneficiaries). If the pay-as-you-go nature of the state pension system is to be maintained, contribution rates will have to go up and/or benefit rates will have to come down. Inevitably, some generation will

be disappointed and will feel cheated. Another ‘solution’ is to abandon the pay-as-you-go nature of the state pension scheme and to finance the excess of current benefits over current contributions out of general revenues or spending cuts in other public expenditure categories. This ‘solution’ can be combined with government borrowing, thus postponing, but not ultimately avoiding, the need for future tax increases or spending cuts.

It is widely acknowledged that the shortfall of current and future public pension contributions (at current contribution rates and rules) relative to current and future pension benefit entitlements (at current benefit rates and entitlement rules), sometimes referred to (inaccurately) as the problem of the underfunded state pension systems, will represent a major source of pressure on public spending in the years ahead.⁴⁴

Many countries have decided to pre-empt a possible crisis by moving from the pay-as-you-go system to a partially funded mandatory state pension system.⁴⁵ If this were done very abruptly, it would involve imposing very high costs for the present working generation. They would still principle have to pay (at the old rates and eligibility rules) for the pensions of the already retired generations. In addition, they would have to save for their own pensions. Since it is not politically acceptable to put all of this burden on one generation, most countries have chosen to spread the cost of adjusting to demographic surprises and productivity disappointments over time. Theoretically this can be done either by phasing in the funded system, i.e. maintaining the pay as go system but allowing funded components to play an increasing role in the provision of pensions, or by state borrowing.

All countries we are concerned with appear to have chosen to put emphasis on the former mechanism than on the latter. Over the last decade many countries have initiated pension reforms that will move the bulk of the mandatory state pension systems eventually to

⁴⁴ It is inaccurate because a pay-as-you-go scheme is, by construction, meant to be completely unfunded.

a fully funded system, with a much reduced pay-as-you go component. An international comparison of the resulting pressures on government finances is rather difficult. Future budgetary pressures are greater when pension reforms are less advanced and where the societies are ageing more quickly. With respect to both these categories there are significant differences across the countries in the current EU and the accession countries.

Table 9 here

The OECD has tried to estimate the impact on government spending of greying populations taking into account the pension reforms already enacted. On average the EU countries were spending 9% of GDP on public pensions in 2000, which is not too different from the 8.2% of GDP that was spent by the three largest accession countries in the same year. However in both groups, there are large variations. While the UK spent only 4.3% of GDP on its state pension system, Italy's pension system absorbed a staggering 14.2% of GDP. Similarly, Hungary spent 6% of GDP on its pension system while Poland spent 10.8%.

Similar differences arise when pension liabilities are projected forward. While it is estimated that the Netherlands's public spending on pensions is going to rise by 5.3% of GDP over the next five decades, spending on old age pensions is not expected to rise at all in the UK. Among the accession countries, Poland's spending is expected to decrease by 2.5% of GDP while the Czech Republic is believed to have to spend another 6.8% of GDP on pensions at the peak.

The OECD has simulated the changes in public sector deficits, assuming that other spending and revenues will stay constant. From the last column in Table 9 it becomes apparent that some countries will need much larger adjustments than others if they want to

⁴⁵ This is an example of a 'solution' to the problem that involves a reduction in benefit rates

avoid a widening of the government deficits. Spain's deficit at the peak in 2050 will widen by 8% of GDP if no corrective action is taken while the deficit in Italy is going to stay essentially unchanged. Similarly the deficit of the Czech Republic is going to widen by 6.7% of GDP until 2050 while that of Poland is going to narrow by 1.3%.

These differences in the impact of the pension system on the public sector balances are mostly explained by how far advanced the pension reforms are and by different demographic structures. Thus in the decomposition of changes in spending, the largest variation across countries is found in the contribution of the dependency ratio and the benefit ratio. Pension liabilities in Poland, Hungary and the Czech Republic are currently kept down by the still relatively low life expectancy for men (respectively 67 years, 70 years and 72 years) compared to an average of 74 years in the EU. However, these countries also have among the lowest fertility rates, indicating that while the pressures from an ageing population might not be that strong now, they will become so before long.

While all countries will experience spending pressure due to higher dependency ratios, many countries' pension reforms are now far enough advanced that spending will decline due to cuts in benefit ratios. Thus while Poland's spending on pensions is going to increase by 7.3% of GDP due to its ageing population, its pension reform will result in savings of 5.9% of GDP due to lower average pensions compared to earnings (benefit ratio).

The sustainability of public sectors finances is clearly affected to different degrees by the future of public spending on pensions. Countries like Poland or the UK are much further advanced in their pension reform than countries like the Czech Republic or Sweden. The lower unfunded pension liabilities of the former as witnessed by the changes in deficits in the last column of Table 9 mean effectively that Poland and the UK countries face significantly

or more stringent entitlement rules for those currently working

lower future pressures on the public finances *from this source* than do the Czech Republic or Sweden.

Neither the current general government gross debt stock, nor the current general government financial deficit (actual or cyclically corrected) can capture the future public finance pressures associated with partial reform of the state pension system. Countries that have already enacted and implemented the bulk of their pension reforms are likely to have brought forward much of the budgetary cost of smoothing across generations the traverse to a fully funded system. A well-designed traverse may well require higher current public spending in return for lower future public spending. The optimal speed and timing of the traverse to a funded system should depend on the demographic structure of a country and a nation's views on intergenerational fairness. However, the fiscal-financial rules of the Pact and the Treaty do not allow for flexibility with respect to borrowing to finance the appropriate share of the one-off expenditures that may be associated with an efficient and fair traverse to a funded system.

VIII. A Reform Proposal: The 'Permanent Balance' Rule

Having reviewed most of the main shortcomings of the current fiscal-financial rules of the Pact, we will now propose a different rule, which would avoid these defects. We start with what the rules are supposed to do, namely secure the solvency of a country's public sector's finances, now and in the future, taking into account different initial positions (e.g. different public sector capital stocks, different nominal debt to GDP ratios and different stages in public pension reform) and different future development paths (e.g. real appreciation, real GDP growth differences etc.).

Again we start from the basics. The general case of unrestricted cash returns on the public sector capital stock implies the following general government solvency constraint:

$$b \leq \frac{s^p}{r^p - n^p} \equiv \frac{\tau_0^p + \theta^p k^p - g_T^p - g_C^p - g_I^p}{r^p - n^p} \quad (28)$$

We now treat all spending and revenue flows other than taxes, τ_0 , as exogenous or given to the policy maker. The exercise is to find a ‘least-cost’ or efficient way of financing a given public expenditure programme, allowing for any future financial returns on the general government capital stock. 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 constant⁴⁶ at a value, τ_0^p , no less than the sum of the permanent public spending share in GDP (itself the sum of the permanent government transfer share, the permanent public consumption share and the permanent public investment share) plus the long-run growth-adjusted real interest cost of the public debt (as a fraction of GDP), minus the permanent government capital income share. That is:

$$\begin{aligned} \tau_0 = \tau_0^p &\geq g^p + (r^p - n^p)b - \theta^p k^p \\ &\equiv g_T^p + g_C^p + g_I^p + (r^p - n^p)b - \theta^p k^p \end{aligned} \quad (29)$$

This tax smoothing rule means that the *inflation-and-real-growth-adjusted permanent government budget* is in balance or in surplus. We call it the *Permanent Balance 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 the actual (anticipated) future income stream plus initial financial

⁴⁶ In a stochastic world, it would only be constant ex-ante, or in expectation.

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 Balance 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 shares of GDP.

The permanent balance rule given in (29), together with (5) (7) (8), implies the following behaviour of the general government debt-GDP ratio:

$$\begin{aligned} \dot{b} &\leq g - g^p + \theta^p k^p - \theta k + \left[(r - r^p) - (n - n^p) \right] b \\ &\equiv g_T - g_T^p + g_C - g_C^p + g_I - g_I^p + \theta^p k^p - \theta k + \left[(r - r^p) - (n - n^p) \right] b \end{aligned} \quad (30)$$

In terms of the conventionally measured financial general government deficit, (30) implies:

$$\begin{aligned} \eta &\leq (n + \pi) b \\ &\quad + g_T - g_T^p + g_C - g_C^p + g_I - g_I^p + \theta^p k^p - \theta k + \left[(r - r^p) - (n - n^p) \right] b \end{aligned} \quad (31)$$

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-adjusted measure. It can also be viewed as a modified and generalised version of the golden rule: when actual, current government consumption is above permanent government consumption, or when actual current 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: borrowing can only safely finance public investment to the extent that current public sector investment exceeds its permanent level. Finally, the borrowing limit is relaxed (tightened) when the real interest rate is temporarily high (low) or the real growth rate is temporarily low (high).

The Permanent Balance Rule has four attractive features:

1. The Permanent Balance rule is prudent - even cautious: it has government solvency built in. If the tax rule in (29) 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 Balance 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, public consumption and public investment spending from their long-run average or permanent levels. It also allows 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 Balance Rule allows for the effects of inflation and real GDP growth on the true burden of the public debt. It does not 'condone' inflation any more than it 'condones' real GDP growth. It simply recognises the influence of nominal GDP growth on the burden of servicing domestic-currency-denominated general government debt.
4. The Permanent Balance Rule amends, extends 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 Balance 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]).⁴⁷

Conceptually, the Permanent Balance Rule is both intuitive and simple. Of course, the permanent shares in GDP of public consumption and public investment are not directly

⁴⁷ Long-run means $g_T = g_T^P$; $g_C = g_C^P$; $g_I = g_I^P$; $r = r^P$; $n = n^P$.

observable. Neither is the long-run growth rate directly 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 Balance 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.

IX. The Pact vs the Permanent Balance Rule

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. The government of country U now wishes to build up its public sector capital stock. This means it would like to set $g_I > g_I^P$. Therefore, the government of country U would like to borrow. It ought to be able to borrow, and the Permanent Balance Rule would permit it to borrow.⁴⁸ The Stability and Growth Pact, however, would stop it from borrowing (on a cyclically adjusted basis).

Now consider country I , which has a large and reasonably efficient general government capital stock but also has large implicit future state pension liabilities.⁴⁹ For this country, $g_I \leq g_I^P$, and $g_T \ll g_T^P$. The last inequality reflects the expectation that future state pension benefit payments will significantly exceed current levels. The Permanent Balance Rule implies that, *cet. par.*, country I should be making efforts to reduce its debt-GDP ratio now, in order to make room for these future pension obligations. The Stability and Growth

⁴⁸ In the case of the UK, the catch-up investment boom in the general government sector could easily last a couple of decades.

Pact rules consider only the present and the past (as summarised in the outstanding stock of (gross) debt). As the rules are not forward-looking, they will not suggest any need for fiscal restraint until the high future pension payments are upon us and show up in excessive current deficits and a rising debt ratio..

If this is a serious issue for countries U and I , it could be an even more serious issue for the accession candidates. Despite eleven years of, by and large, successful transition, the infrastructure of these countries is still in a woeful state. They should be investing heavily in infrastructure ($g_I \gg g_I^P$). Indeed the ‘Acquis’ requires them to engage in such investment. Communism and central planning have also left an appalling 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 as public investment or public consumption. There can be little room for doubt that the accession candidates should, for the next couple of decades, be in a position where, at least as regards environmental expenditures, $g_C + g_I \gg g_C^P + g_I^P$. *Ceteris paribus*, this justifies a rising public debt-GDP ratio, according to the Permanent Balance 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 or transfers from the EU budget.

The eight East and Central European early accession candidates have demographic structures rather like those of the existing continental EU members: birth rates are low, the population is greying and total population size is constant or declining gently. Some of them, like the Czech Republic, also have costly unfunded state pension systems. Extrapolating current benefit entitlement and contribution rules, there will be a growing ‘social security

⁴⁹ See European Commission [2001a] for some interesting data on future state pension scenarios in EU member states. Reform options are reviewed in McMorrow and Roeger

deficit' in the coming decades. In terms of the Permanent Balance rule, $g_T < g_T^P$. *Ceteris paribus* this should encourage the accession candidates to reduce their debt-GDP ratios now. 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 carefully.

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 small public sector capital stock, while I has a high public debt and a large 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 the government of country U wishes to raise both k and b , keeping $k - b$ constant; and that the government of 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 can. The economic logic of the two cases requires them to be treated symmetrically. The Permanent Balance Rule handles this case gracefully. With $g_I > g_I^P$ country U can increase its debt-GDP ratio according to the Permanent Balance Rule, and with $g_I < g_I^P$ country I can reduce its debt-GDP ratio.

X. Conclusion.

One (perhaps *the*) important virtue of the numerical fiscal-financial criteria of the Pact and the Treaty is that they are simple, 'objective' and verifiable. In principle, the determination of whether these criteria are satisfied can be performed mechanically, requiring

neither political judgement nor significant administrative or analytical competence or sophistication. During the gestation period of the Stability and Growth Pact, there was indeed quite a bit of support for putting the process of determining compliance with the fiscal-financial criteria on 'auto-pilot'. The view that the monitoring of compliance and the imposition of penalties should be turned into a purely technical verification procedure, without any room for political discretion and negotiation, did not prevail. In many ways, this was just as well. The criteria may be precise, but they also are arbitrary and may well give the wrong signals. It is better to be approximately right than precisely wrong.

What the parties negotiating the Pact ultimately agreed upon were not only the three numerical ceilings, suggesting a non-discretionary procedure for verifying compliance, but also two ways of introducing elements of flexibility and discretion.

The first of these is a procedure for judging members' performance with respect to the fiscal-financial criteria that leaves the final determination of compliance to the Council (ECOFIN). By making the Council the final arbiter, the Pact has created scope for political discussion and negotiation regarding both the 'findings of fact' and the determination of sanctions and penalties. A striking example is the decision in April 2002 not to issue a formal warning to Germany and Portugal about the risk of the two countries violating the three percent deficit ceiling. This was followed in June 2002 by leniency towards France and Italy, both as regards the date by which the budget was to be close to balance or in surplus (this was postponed by one year), and as regards the meaning of 'close to balance' which now has softened to encompass a general government deficit of up to 0.5 percent of GDP. With Portugal now also likely to breach the three percent deficit ceiling without a 'deep recession' as a mitigating factor, it will be interesting to see whether the financial penalties permitted under the Treaty will be imposed.

The second element of flexibility and discretion relates to the interpretation of the requirement that the cyclically adjusted budget be close to balance or in surplus. The *time horizon* over which this is to be achieved has been interpreted with steadily augmenting leniency. In a number of cases deadlines in Stabilisation and Convergence Programmes have been extended without any substantive economic justification being given (such as, say, unexpected developments in the duration and/or amplitude of the business cycle). In addition, the target 'close to balance or in surplus' has, in June 2002, been interpreted as compatible with a deficit of up to half a percent of GDP, and it is not at all unlikely that further relaxation is in store.

An optimal rule is both credible and flexible. Flexible need not mean opportunistic. Credible need not mean rigid and inflexible. Commitment is not necessarily sacrificed when a rule is made contingent on observable, verifiable events or outcomes - preferably events or outcomes that cannot be manipulated by those implementing the rule or by those judging performance under the rule.

The problem with the current informal compromise is that today there still is insufficient flexibility but there also is too much scope for opportunistic, politically motivated manipulation of the framework and the process. There is no coherent conceptual framework to structure and focus the assessment of the likelihood and significance of one or more of the numerical thresholds being exceeded. The conditions under which warnings will actually be issued and penalties actually imposed are obscure and intensely political.

There is a need for the EU and ECB to present to the public a clear conceptual framework to motivate and explain the concepts of fiscal sustainability and excessive deficits, and to relate these fundamental notions to concrete quantitative fiscal-financial objectives (which could be time- or state-contingent) and to specific policy actions or rules. Without such a conceptual framework, it will be hard to convince a sceptical public of the economic

merits of any ECOFIN decision to condone or penalise an overshooting of the numerical ceilings. Without it, not only are the Pact's numerical criteria becoming discredited, but also the fundamental notion of fiscal-financial sustainability.

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 and 60 percent of GDP general government gross debt ceiling are not well-designed to deliver their objectives of viable fiscal-financial programmes conducive to sustainable growth. The strains on the Pact will be greatly increased once the current accession candidates become EU members.

The fiscal challenges put before the accession candidates are formidable. They include inadequate infrastructure and a depleted environmental capital stock, as well as unfavourable demographics and welfare state ambitions found elsewhere only in much richer countries. In addition, several accession countries, among them Poland, the Czech Republic and Hungary, are entering the run-up to EU membership with general government deficits that are, by any measure, excessive. It is essential that the difficult, indeed painful fiscal choices that will have to be made by the accession candidates not be compounded by arbitrary, externally imposed, fiscal-financial constraints that are not grounded in economic fundamentals.

The aim of preventing excessive government deficits and excessive public debt is shared by everyone. The Pact, unfortunately, is apt to lead to errors of commission as well as to errors of omission. It will cause the cry of 'wolf' (or 'excessive deficit') to be raised on many occasions when there is no wolf in the vicinity. It may also cause the shepherd to relax when the wolves are sneaking up on the flock.

Strict enforcement of uniform numerical deficit rules and the uniform debt norm would cause serious problems even for existing EU members whose initial conditions are

different from the EU average (e.g. the UK) and whose medium-term growth rates and inflation rates may differ significantly from the EU average (e.g. Ireland). 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 in accession countries. Higher real GDP growth rates and lower risk-free real interest rates (through financial market integration and Balassa-Samuelson effects) also enhance the fiscal authorities' ability to sustain debt and deficits. The need to catch up in the areas of infrastructure and environmental standards also justifies increased, albeit strictly limited, recourse to borrowing. Our proposed 'Permanent Balance Rule' for the share of taxes in GDP offers a starting point for designing more robust fiscal norms.

Formally revising the Stability and Growth Pact rules (and the convergence criteria for EMU membership) will not be easy. Taking the long-term view, however, the cost of sticking with a flawed set of rules is bound to dominate the short-term reputational damage caused by any significant redesign of the rules. We therefore recommend that the review and revision process start as soon as possible, and that it be considered and presented as an opportunity to re-emphasize and re-affirm the common purpose of debt sustainability and fiscal prudence.

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Table 1: General Government Budget Balance for 10 Central European Accession Countries (% of GDP)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
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
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	-5.2
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
Romania	na	na	na	-4.6	-0.4	-2.2	-2.5	-3.9	-4.6	-5.0	-3.5	-3.7	-3.5
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
Average Accession 8*	na	na	na	na	na	-2.6	-2.5	-2.4	-2.2	-3.0	-4.3	-2.9	-3.1
Average Accession 10	na	na	na	na	na	-2.7	-2.8	-3.3	-2.4	-2.8	-3.9	-2.8	-3.0

*Accession 8 includes all countries but Bulgaria and Romania

Source EBRD

Table 2: General Government Surplus for the EU member countries, the US and Japan

General Government Surplus of EU Countries (% of GDP)														
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002*
EU average	-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 average	-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

* data for 2002 is a projection

Table 3: Gross Public Debt of Accession Countries (% of GDP)

Gross Public Debt of Accession Countries (% of GDP)												
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Bulgaria	na	na	154	159	151	160	72	156	119	103	98	94
Czech Republic	na	na	na	na	24	20	16	13	12	12	14	17
Estonia	na	na	na	na	na	na	na	na	8	7	7	6
Hungary	na	na	na	na	na	137	131	108	89	89	91	85
Latvia	na	na	na	na	na	na	na	15	12	11	13	13
Lithuania	na	na	na	na	na	na	na	na	21	22	28	27
Poland	na	na	na	na	na	70	57	49	49	44	45	43
Romania	na	na	na	na	na	na	20	23	25	24	30	28
Slovak Republic	na	na	na	na	na	na	na	11	11	14	16	19
Slovenia	na	na	na	na	28	25	23	24	25	26	26	27
Accession 8	na	na	na	na	na	na	na	na	28	28	30	30
Accession 10	na	na	na	na	na	na	na	na	37	35	37	36

Accession 8 is the average of all countries but Bulgaria and Romania
Source EBRD

Table 4: Gross Public Debt of Member Countries of the European Union and the US and Japan

Gross Debt of EU Member countries (% of GDP)											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
EU15	na	na	na	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	
Luxemburg	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	na	na	na	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	

General government debt (% of GDP)
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.

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 on government debt.

i^* : foreign instantaneous nominal interest rate.

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.

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

$\eta \equiv \dot{B}/(PY)$: 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
GNI per capita in accession candidates compared to EU average
(current \$ and PPP)

GNI of accession countries and EU countries in comparison				
	Market Prices		PPP	
	1986	1999	1986	1999
% of EU 99				
Greece	45	51	74	68
Ireland	65	91	62	97
Portugal	30	47	59	68
Spain	56	63	73	77
Average	116	63	67	77
Bulgaria		6		22
Czech Republic		21		55
Estonia		15		35
Hungary		20		47
Latvia		11		27
Lithuania		12		28
Poland		17		36
Romania		6		26
Slovak Republic		15		45
Slovenia		43		69
Average Accession 10		17		39
Average Accession 8		19		43
% of EU 85				
Greece	39	47	65	61
Ireland	56	83	54	87
Portugal	26	43	52	61
Spain	48	57	63	69
average	42	58	59	69

Table 7: How many years to catch up?

Absolute difference in real GDP growth rates needed to catch up with the EU average in 25 (50) years		
	full catch up in 25 years	full catch up in 50 years
Bulgaria	6.2	3.0
Czech Republic	2.2	1.1
Estonia	4.1	2.0
Hungary	2.9	1.4
Latvia	5.3	2.6
Lithuania	5.1	2.5
Poland	4.0	2.0
Romania	5.5	2.7
Slovak Republic	3.1	1.5
Slovenia	1.3	0.7
Greece	1.4	0.7
Portugal	1.4	0.7
Spain	0.9	0.4

Data Source: WDI

Assumption:EU grows at 2%

Table 8: Gross Public Fixed Capital Formation in Current EU countries and Accession Countries

Gross Public Fixed Capital Formation (% of GDP)					
	2000	Average (2002-2005)		2000	Average (2002-2005)
	actual	projection		actual	projection
Average EU 15	2.6	2.7	Average Accession 8	3.9	4.3
Austria	1.7	1.5	Average Accession 10	3.6	4.0
Belgium	1.8	1.5	Bulgaria	3.7	3.8
Britain	1.4	1.9	Czech Rep.	5.9	6.1
Denmark	1.6	1.8	Estonia	3.2	3.9
Finland	2.5	2.5	Hungary	5.0	5.3
France	3.0	3.0	Latvia	4.0	5.2
Germany	1.9	1.7	Lithuania	1.9	2.3
Greece	4.1	4.4	Poland	3.1	3.8
Italy	2.6	2.7	Romania	1.4	1.9
Luxembourg	3.0	2.6	Slovak Rep	3.6	3.8
Netherlands	3.2	3.4	Slovenia	4.1	4.1
Spain	3.3	3.7			
Sweden	2.4	2.3			
Portugal	3.8	4.2			

Source WEO

Table 9: Public Sector Spending on Pensions and the projected Impact on Public Sector Deficits.

Public Spending and Revenues on Old Age Pensions (% of GDP)								
	Spending						Revenues	Deficit
	2000 Actual	Change to Peak* Projection	Contribution to Change in Spending (Projection)				Change Projection	Change Projection
			Dependency Ratio	Benefit Ratio	Eligibility Ratio	Other**		
Czech Rep	7.8	6.8	8.2	-0.1	-0.1	-1.2	0	-6.8
Hungary	6	1.2	2.9	-0.3	-0.4	-1.0		
Poland	10.8	-2.5	7.3	-5.9	-2.1	-1.8	-1.2	1.3
Average	8.2	1.8	6.1	-2.1	-0.9	-1.3	-0.6	-2.75
Austria	9.5	4.3	7.6	-1.1	-2.4	0.2		
Belgium	8.8	3.7	4.7	-1.6	1	-0.4	0.1	-3.6
Denmark	6.1	3.6	2.7	-1.5	1.7	0.7	1.7	-1.9
Finland	8.1	4.8	5.2	-0.2	0	-0.2	-1.7	-6.5
France	12.1	4	7.6	-3.4	0.4	-0.6		
Germany	11.8	5	6.4	-2.7	2.1	-0.8	2.8	-2.2
Italy	14.2	1.7	10.1	-5.5	-1.5	-1.4	0	-1.7
Netherlands	5.2	5.3	3.8	0.2	1.4	-0.1	3.2	-2.1
Portugal	8	4.5	6.1	-2.7	1.1	0.0	1.5	-3
Spain	9.4	8	8.6	0	2	-2.6	0	-8
Sweden	9.2	2.2	3.9	-2.1	0.4	0.0	-3.3	-5.5
UK	4.3	0	1.7	-2.5	0.11	0.7	-0.3	-0.3
Average EU	8.9	3.9	5.7	-1.9	0.5	-0.4	0.4	-3.48
US	4.4	1.8	2.4	-0.2	-0.3	-0.1	-0.3	-2.1
Japan	7.9	1	5.1	-3.9	0.9	-1.1	0.1	-0.9

* Peak year is 2050 (end of simulation) except for UK and Italy (2030), the US, Sweden, Austria, Denmark and France (2035) and the Netherlands and Belgium (2040)

** Other consists of the impact of changes in the employment ratio

Average Accession is the average of Czech Rep., Hungary and Poland

Average EU is the average of all EU countries but Luxemburg, Greece, Portugal and Ireland

Dependency ratio is defined as the share of the population in retirement age compared to the working age population

Benefit ratio is defined as the average pension divided by average productivity

Eligibility ratio is the share of the retired population eligible for a pension.

Source: OECD

Appendix 1: Permanent Flows and Discount Rates

We define the *permanent* primary surplus/GDP ratio s^p as that constant primary surplus/GDP ratio whose present discounted value is the same as the present discounted value of the actual (or anticipated) future sequence of primary surplus/GDP ratios. If the relevant time horizon is infinite, this amounts to:

$$s^p \equiv \left(\int_t^\infty e^{-\int_t^v [r(u)-n(u)]du} dv \right)^{-1} \int_t^\infty e^{-\int_t^v [r(u)-n(u)]du} s(v) dv \quad (\text{A1.1})$$

Permanent values of all other flows of expenditure or receipt ratios to GDP 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 for this real perpetuity as is generated using the actual (or anticipated) future values of $r - n$. This means that:⁵⁰

$$\left(\int_t^\infty e^{-\int_t^v (r^p - n^p) du} dv \right) \equiv \left(\int_t^\infty e^{-\int_t^v [r(u)-n(u)] du} dv \right) \quad (\text{A1.2}).$$

It then follows that

$$r^p - n^p \equiv \left(\int_t^\infty e^{-\int_t^v [r(u)-n(u)] du} dv \right)^{-1} \quad (\text{A1.3})$$

The government's intertemporal budget constraint or solvency constraint can therefore be written compactly as in equation (13) in the body of the paper.

⁵⁰ We require $\bar{r} - \bar{n} > 0$.

Appendix 2: The Balassa-Samuelson Effect

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

$$\pi_T^A = \pi_T^E + \varepsilon$$

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.⁵¹ 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

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

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

⁵¹ 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

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

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.