Edited by
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BUILDING
THE
NEW EUROPE

Volume 1: The Single Market
and Monetary Unification

Central Issues in
Contemporary Economic Theory
and Policy

General Editor: Mario Baldassarri

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EMU and Greece: Issues and Prospects for Membership

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1. - Introduction

The EC's recent initiative to integrate its market for goods, services, labor and capital, has been accompanied by progress toward establishing a monetary union within the EC. As part of this process, the European Council appointed a Committee to study and propose concrete stages leading to monetary union. The *Delors Committee Report* [7] proposed a three-stage approach to full monetary union. The first two stages involve the gradual elimination of all barriers to free capital mobility within the EC and greater coordination of monetary policies among EC members under the present system of separately managed currencies. Stage one would involve the participation of all EC members in the exchange-rate mechanism of the EMS, including those who do not presently participate (Greece, Portugal and the United Kingdom). Stage two would require coordination of monetary policies and an understanding that exchange-rate realignments would be made only in exceptional circumstances. Full

unification would be achieved in stage three, which involves the transfer of monetary management to a European System of Central Banks (ESCB) and a single EC currency.

The issue of European monetary integration has received considerable attention from policymakers and academics much before the *Delors Commission Report* was issued, insofar as the desirability establishing a nominal anchor by joining the EMU can be assessed on the same basis as the desirability of joining the existing European Monetary System (EMS). The issues addressed include the desirability of fixed nominal exchange rates in the presence of independent demand or supply shocks that affect member countries asymmetrically; and concerns about an overly restrictive fiscal policy under an exchange-rate system anchored on the Deutschmark (see Van der Ploeg [14], for a summary of the advantages and disadvantages of European monetary union).

This paper focuses on the narrower issue of the feasibility of fixing the nominal exchange rate in an EC country with a large fiscal deficit which is the source of money creation and above-average inflation (1). This issue, arises, to various extents, in all the South European countries, but is particularly relevant to Greece, which has the highest inflation rate and fiscal deficit among the EC countries. Dornbusch [8] advocates a «crawling peg» under which the currencies of the Southern European countries would gradually depreciates *vis-à-vis* the nothern countries in order to maintain competitiveness. Underlying his proposal is the concern that the loss of. revenue from monetization under the EMU would require a fiscal adjustment in the Southern European countries to ensure the sustainability of their public debt. If the loss of revenue from monetization cannot be easily made up through other revenue sources (because a larger black economy reduces the tax base), it may be preferable to accommodate the existing inflation differential through currency depreciation. This argument is strengthened if some of the South European countries start from an unsustainable fiscal position:

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(1) Even if the European Central Bank is less conservative than the Bundesbank, so that the EC average inflation rate rises, the EMU would imply lower inflation for EC countries with above-average inflation rates.

for these countries, the loss of revenue from monetatization under the EMU adds to the deficit reduction required to attain a sustainable fiscal position.

Gros [11] has argued that the crawling peg proposal overlooks the benefits of low inflation and monetary discipline that the EMU anchor would entail. France has reaped these benefits by pegging to the Deutschmark since 1986 and «importing» the German inflation rate. A tight fiscal stance and a clear signal that the French monetary authorities will not accommodate any wage settlements that emerge from the negotiating table contributed to the success of this policy. Among the South European countries, Spain has opted to reap the credibility gains associated with the Bundesbank's past performance by joining the EMS in 1989. Italy, whose currency has tended to depreciate in past EMS realignments, has recently narrowed its fluctuation band in the EMS and eliminated all remaining exchange controls. Portugal remains outside of the EMS, but acts as if it is in, by targeting a reduction in the inflation rate toward the EC average. By contrast, monetary policy in Greece remains severely constrained by the size of the fiscal deficit. Paragraphs 2-4 of this paper provide an overview of policies and economic performance in Greece in the 1980s compared with the rest of the EC, and use a simple framework to assess the fiscal adjustment required to reach a sustainable fiscal position under different inflation targets.

While the credibility gains of pegging to a low-inflation currency area are no doubt substantial, a credible commitment to join the EMS or the EMU requires a sustainable fiscal position. If the size of the required adjustment to sustainability is very large, this commitment will not be credible. Moreover, a trade-off will arise between the gains from disinflation and the resulting loss of revenue from inflation. Although the government budget constraint exists independently of the exchange rate regime chosen, this constraint becomes more severe if government revenues from inflation are foregone, as noted above. Additional costs would be incurred if the — yet unspecified — timetable for implementation of the EMU is short. Branson [3] points out that if the output cost of rapid disinflation is high, it may be preferable to join the exchange rate arrangements after the rate of inflation has been reduced to the range of existing members.

Another issue that arises in the context of the EMU is the required degree of fiscal policy coordination through the various stages of EMU and the need for systemic limitation of the fiscal autonomy of member States. The *Delors Committee Report* ([7], Article 59), proposed limits on budget deficits of member countries «to the extent that this was necessary to prevent imbalances that might threaten monetary stability». The underlying presumption is that the preservation of price and financial stability in the EMU requires a regulatory framework to prevent overlending and overborrowing: private creditors may not base their lending decisions on country risk analysis alone if they perceive the ESCB as a lender of last resort. Although an analysis of the moral hazard issue in the EMU is beyond the scope of this paper, paragraph 2 of the paper notes that Greece has had access to spontaneous external financing from international capital markets on a larger scale than countries in a similar situation which are not members of the EC (Mexico and Turkey are chosen as examples). It could thus be argued that the moral hazard issue may arise independently of the existence of the EMU; all that is required is that private creditors perceive that the EC will «stand behind» any of its members through the provision of financing and guarantees.

The Delors Committee ([7], Article 59) proposal to impose limits on budget deficits was accompanied by a recommendation to apply to Community loans (as a substitute for the present medium-term financial support facility «terms and conditions that would prompt member countries to intensify their adjustment efforts». Because the substitution of EC resources for market-based lending would shift the risk of default from individual member countries to the EC as a whole, the EC would undertake to monitor and contain fiscal imbalances through some form of conditionality. The financial stability of the EMu could still be threatened under this risk-transfer scheme depending on how strictly this conditionality is imposed. The experience with the existing EC medium-term financial support facility shows that the degree of adjustment undertaken ultimately depends on the member country. France, which used this facility in 1983, overperformed with respect to the macroeconomic targets specified and repaid the EC loan early; Greece, which used the facility in 1985, is now facing larger macroeconomic imbalances than in 1985.

2. - Economic Policies and Performance in Greece in the 1980s

The period since 1981, when Greece joined the EC, is characterized by a market divergence in both policies and performance relative to the rest of the Community. Since 1981, Greek economic policy has pursued the sometimes contradictory objectives of growth, price stability, and social equity. The autorities' growth strategy relied on expansionary fiscal and incomes policies, while policies in the rest of the Community generally aimed at disinflation and fiscal consolidation. The need to finance budget deficits averaging 14.5% of GDP in the 1980s gave rise to a sharp increase in external and internal public debt and to a sustained increase in money growth well in excess of the EC average. The inflation differential with the EC thus widened in the 1980s, leading to continued depreciation of the nominal effective exchange rate. Throghout the 1980s the announced inflation targets were consistently exceeded, as were the announced budget targets. Expansionary financial policies in Greece did not elicit a sustained output response; on the contrary, they crowded out private investment, with the result that GDP growth in the 1980s slowed considerably more than in the EC as a whole.

Chart 1 compares Greece's growth and inflation record to the EC average in the 1970s and the 1980s. GDP growth in Greece fell from an above-average annual rate of 4.75% in the 1970s to a below-average 1.5% in the 1980s. Similarly, the divergence of inflation rates between Greece and the EC became much more marked; inflation in Greece was only marginally above the EC average in the 1970s, but rose to three times the EC average in the 1980s.

Macroeconomic policies in Greece in the 1980s can be assessed with reference to three periods: an initial phase of expansionary fiscal and incomes policies in 1981-1985, the 1986-1987 stabilization phase, and the period since 1988 which has been characterized by adjustment fatigue and pre-election spending, followed by a sequence of coalition governments since mid-1989. The initial rise in budgetary outlays reflected discretionary increases in social benefits and public sector wages, and was accompanied by a sharp increase in minimum wages which affected wage settlements in the private sector. These

GRAPH 1

GREECE AND EC:
GDP GROWTH

In %

Greece: GDP growth   EC: GDP growth
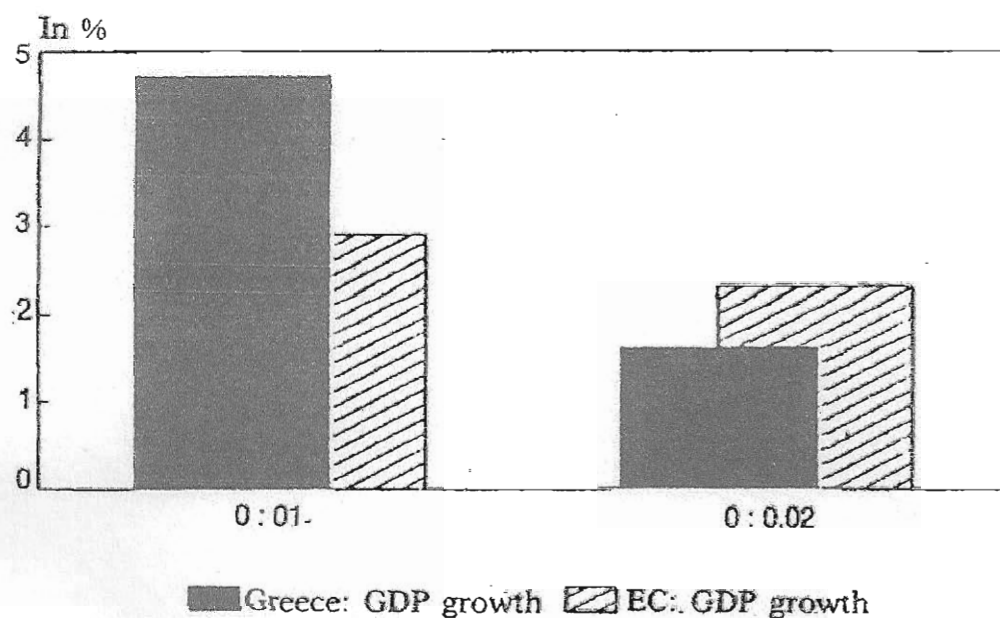
Source: EC COMMISSION: *European Economy.*

GRAPH 1*a*

INFLATION RATES

In %

Greece: inflation   EC: inflation
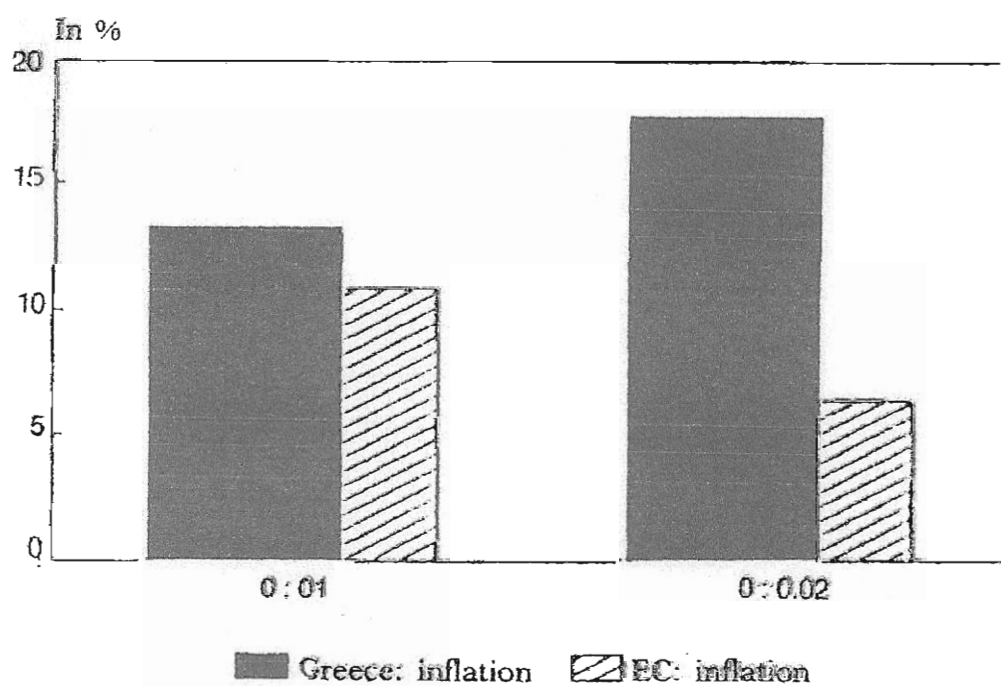
Source: EC COMMISSION: *European Economy.*

policies contributed to large increases in the fiscal and external deficits (Graphs 2 and 3) as most of the stimulus benefited Greece's trading partners. Real wages rose considerably faster than productivity, reducing profit margins and the incentive to invest and produce (Graph 4). This trend continued until 1985, when the current account deficit peaked at 10% of GDP and a stabilization program was undertaken, supported by a $2 billion loan from the EC.

The 1986-1987 stabilization program was successful in reducing somewhat the fiscal and external deficits — though by less than the amount targeted — but not on a lasting basis. First, it relied entirely on a sharp reduction in wages through a modification of the wage indexation scheme, and on the implicit «taxation» of oil products by not passing on to consumers the benefit of the oil price decline in 1986. But the reduction in real wages was achieved by compressing the wage scale to protect lower incomes. Continued compression in the wage scale could not be sustained without reducing the incentive to work and acquire new skills; its microeconomic effects were thus negative and made the policy counterproductive over the medium term. Similarly, there was no lasting reduction in public expenditures or increase in revenues: the fiscal revenue from the taxation of oil products has dissipated as oil prices rose in the world market since 1987 with no corresponding increase in the domestic price of oil products. Second, the stabilization program attempted to correct the macro imbalances without paying attention to the efficiency of resource use. Addressing long-standing structural weaknesses caused by over-regulation of private sector activities would have helped increase private investment and the output response to demand stimulus. These structural issues are discussed below.

The adjustment effort was abandoned in 1988 in favor of a more «growth-oriented» policy. There was a renewed fiscal expansion accompanied by wage increases well in excess of productivity. As was the case in the 1981-1985 period, the relaxation of financial policies had an only transitory impact on GDP growth, while compounding the underlying disequilibria through further increases in the public debt relative to GDP. A stabilization in the debt/GDP ratio would have required a primary fiscal surplus. Instead, the primary deficit remained in deficit throughout the 1980s; its servicing has therefore

GRAPH 2

TOTAL NET PUBLIC DEBT
(in % of GDP)

In % of GDP

☐ Net internl debt/ GDP   ▧ Net externl debt/GDP
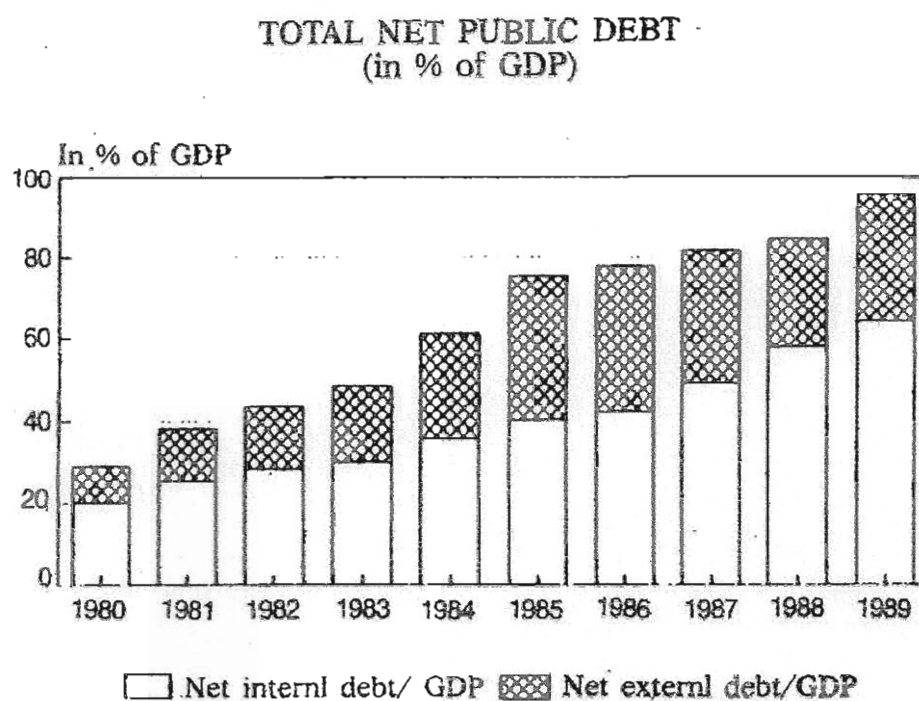
Source: BANK OF GREECE and WORLD BANK.

GRAPH 2*a*

PSBR AND INTEREST PAYMENTS
(in % of GDP)

■ Interest/GDP   ▨ Noninterest PSBR/GDP

Source: BANK OF GREECE.

GRAPH 3

TRADE DEFICIT
(in % of GDP)

Oil deficit   Nonoll deficit   —✳— Oil price ($/barrel)
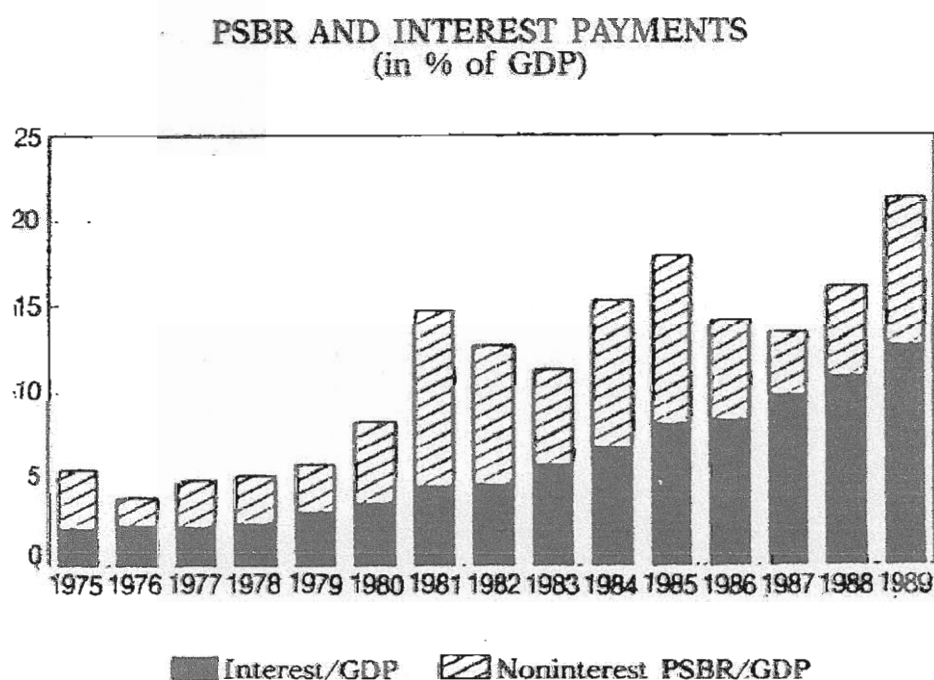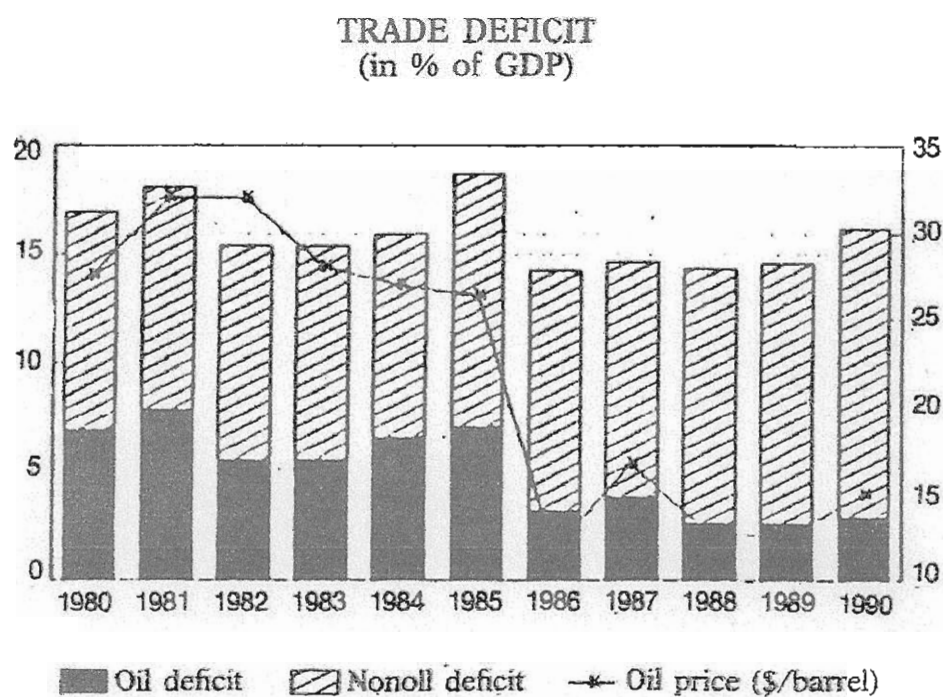
Source: BANK OF GREECE and IFS.

GRAPH 3*a*

CURRENT ACCOUNT DEFICIT
(in % of GDP)

Incl. EC transfers   EC transfers
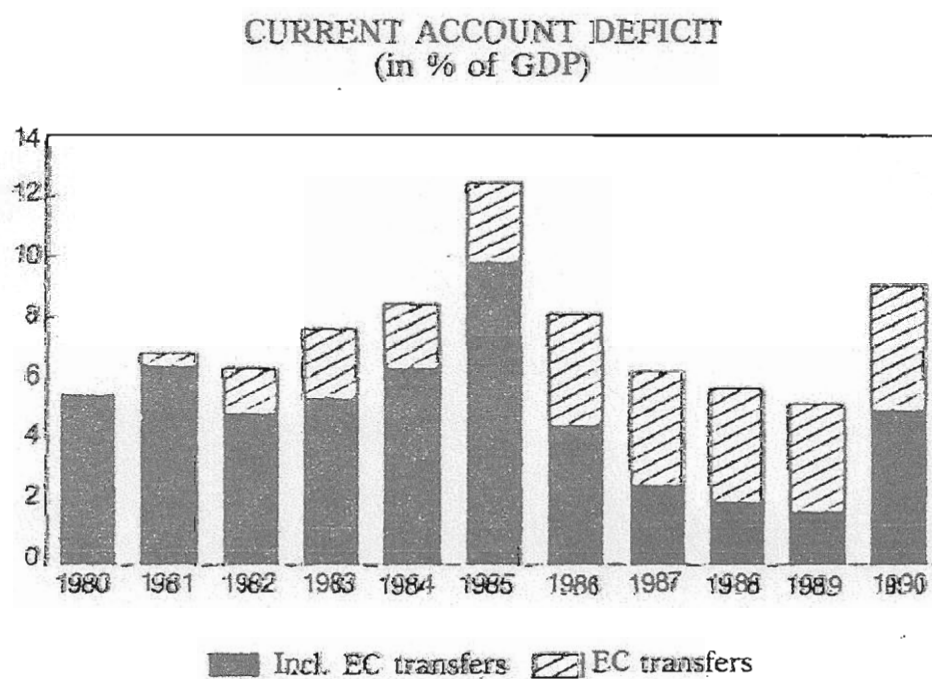
Source: BANK OF GREECE.

GRAPH 4

WAGES AND PRODUCTIVITY
(in %)

— Real wage   —▲— Productivity   ☐ Private investment/GDP
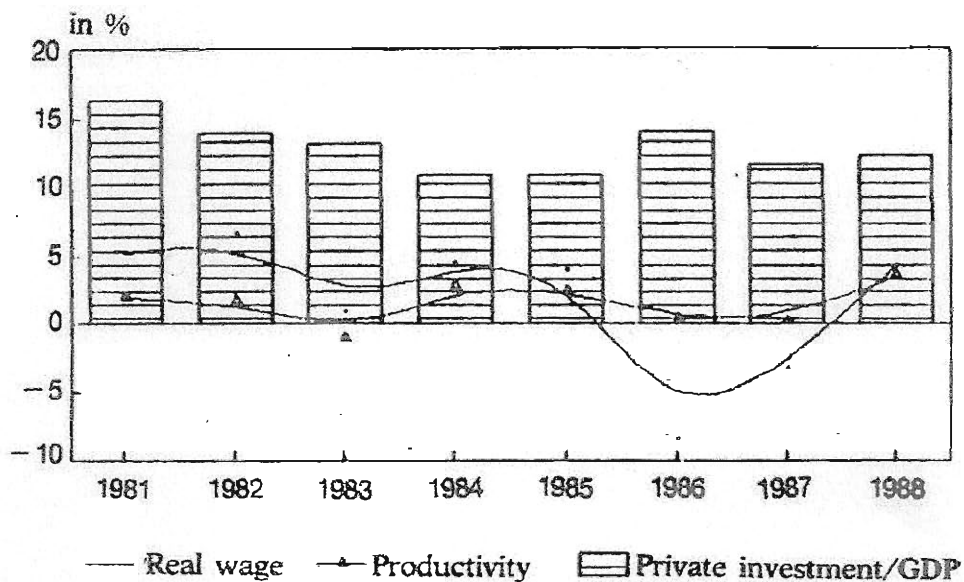
Source: OECD.

NOMINAL AND REAL EXCHANGE RATE
(index, 1985 = 100)

— Real effective rate   —+— Nominal effective rate
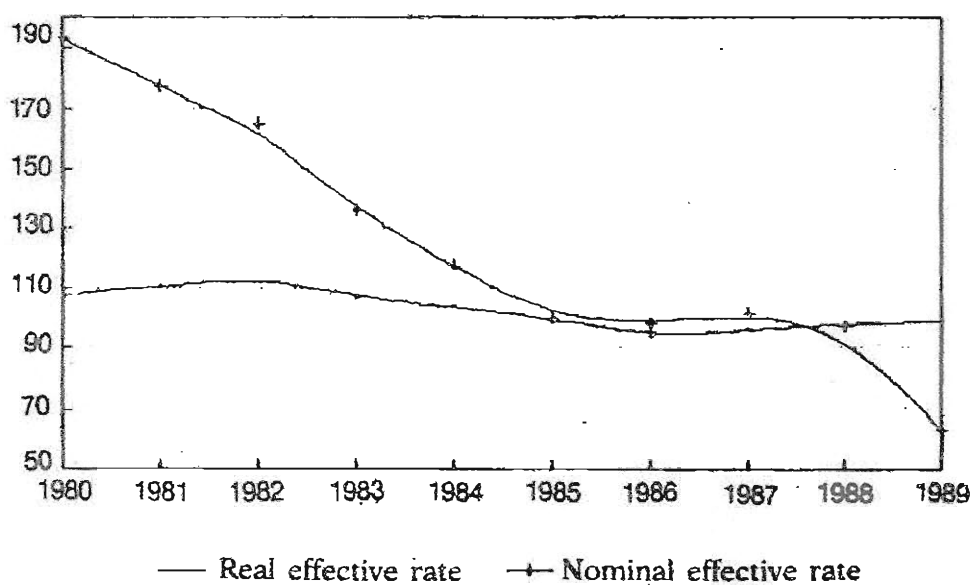
Source: IMF.

been achieved through further borrowing, causing the deficit to feed on itself. The primary deficit resumed its upward trend in 1988 and rose to 8% in 1989 the same level that was reached in 1985, just before the stabilization program was undertaken (Graph 2). But because the stock of public debt was considerably higher in 1989 than in 1985, the total deficit (including interest payments) rose well above the previous peak reached in 1985. The deficit amounted to just over 21% of GDP in 1989 and the total net public debt rose to almost 100% of GDP, about a third of which is foreign debt.

Throughout the 1980s, external conditions were favorable to Greece. Oil prices declined sharply and EC net transfer payments started flowing in (mainly agricultural subsidies under the CAP) in growing amounts. Exchange rate policy essentially accommodated the inflation differential between Greece and its trading partners. Two successive devaluations, in 1983 and 1985, did not have a lasting imact on the real exchange rate in the absence of a sustained reduction in the fiscal deficit. The trade deficit peaked in 1985 at 18% of GDP, and its subsequent reduction under the 1986-1987 stabilization program was due entirely to the decline in oil prices on the world market (Graph 3). The current account deficit similarly peaked at about 10% of GDP in 1985; its subsequent reduction was due mainly to rising EC transfer payments and an increase in private transfers attracted by high nominal interest rates and the perception that the authorities would not devalue again following two devaluations in 1983 and 1985. This perception waned in 1989, when there was a further sharp increase in the current account deficit fueled by a reduction in private transfers, stagnating exports, and booming imports, which may partly reflect capital flight through under-invoicing of exports and over-invoicing of imports.

Gross external public debt rose to an estimated $19 billion at end-1989, equivalent to 35% of GDP (Graph 5). The debt service ratio has tripled since the beging of the decade to 30% of foreign exchange receipts in 1989. These figures exclude military debt and short-term debt, and they also exclude some $11 billion of foreign currency liabilities of the Greek banking system (only a portion of which is subject to reserve requirements). These liabilities are owed to dom-

estic residents and can therefore be considered a domestic rather than a foreign liability.

Foreign borrowing in Greece has financed public and private consumption rather than investment (Graph 6). The shares of both public and private investment in GDP fell sharply in the 1980s, with a brief interruption under the 1986-1987 stabilization program. Rising interest payments on external debt have become larger than the inflows of workers' remittances since 1985, causing GNP to exceed GDP for the first time in the post-war period.

The bulk of Greece's external debt is due to commercial banks. Since 1989, foreign financing has shifted away from bank borrowing toward ECU-linked bond issues, which carry an interest rate of about 100 basis points above the risk-free rate. As these issues have been oversubscribed, Greece's access to financial markets seems to have remained intact — albeit at a higher price — despite an external imbalance which would appear excessive on the basis of any intertemporal optimization model. On a cross-country basis, Greece's external position in 1989 was similar to that of non-EC members which have experienced debt servicing difficultues in the past.

Subject to the caveats that apply to cross-country comparisons of external positions (2), Graph 7 and 8 compare Greece's external position with that of Mexico in 1982 and Turkey in 1979. Both countries experienced liquidity crises in those years, followed by debt rescheduling and concerted lending packages or syndicated balance of payments support loans. The Graphs show that the ratio of external debt to GDP and the debt service ratio in Greece is comparable, if not higher, than in these countries at the peak of their liquidity crises. The maintainance of access to external financing in Grece, in contrast to Mexico and Turkey, may also partly explain why the inflation rate in Greece has remained well below its level in the other countries during their liquidity crises.

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(2) Cross-country differences in the openess of the economy and in the growth of foreign-exchange receipts can have an impact on the ability to service debt, although this would be reflected in different debt ratios to some extent. Differences in saving rates could similarly affect debt servicing ability. The maturity structure of external debt could also play a role by precipitating a liquidity crisis.

EXTERNAL PUBLIC DEBT
(medium/long term)

In billions of US dollars   In % of GDP

◇ External debt   —▲— External debt/GDP

Source: BANK OF GREECE and WORLD BANK.

EXTERNAL DEBT SERVICE
(in % of exports)

■ Debt service ratio   ◇ Interest/exports
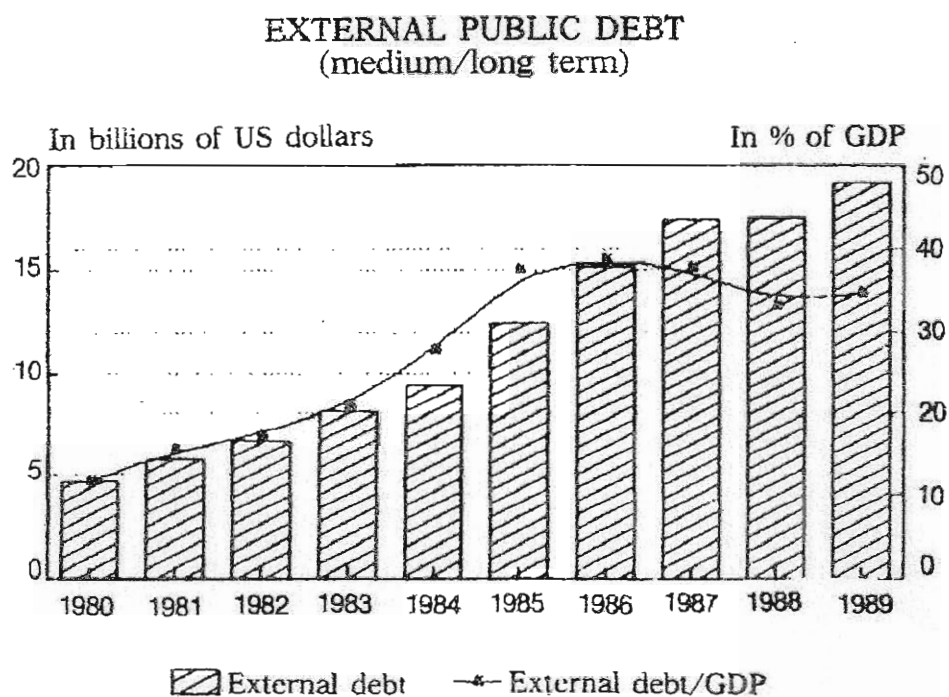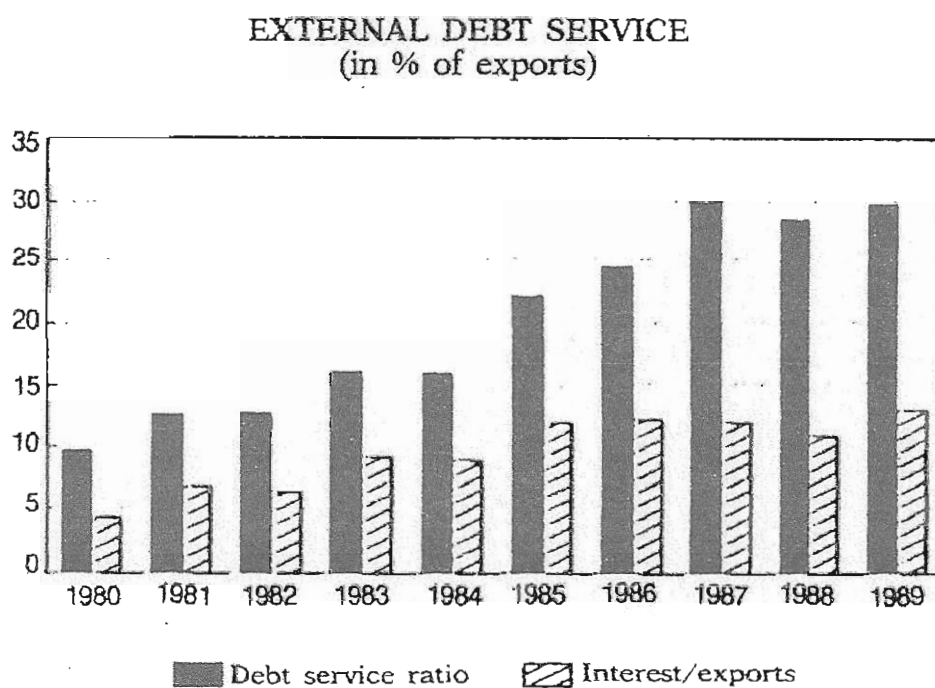
Source: WORLD BANK and BANK OF GREECE.

GRAPH 6

RATIO OF INVESTMENT TO GDP
(in % of GDP)

— Private inv/GDP   — Total inv/GDP
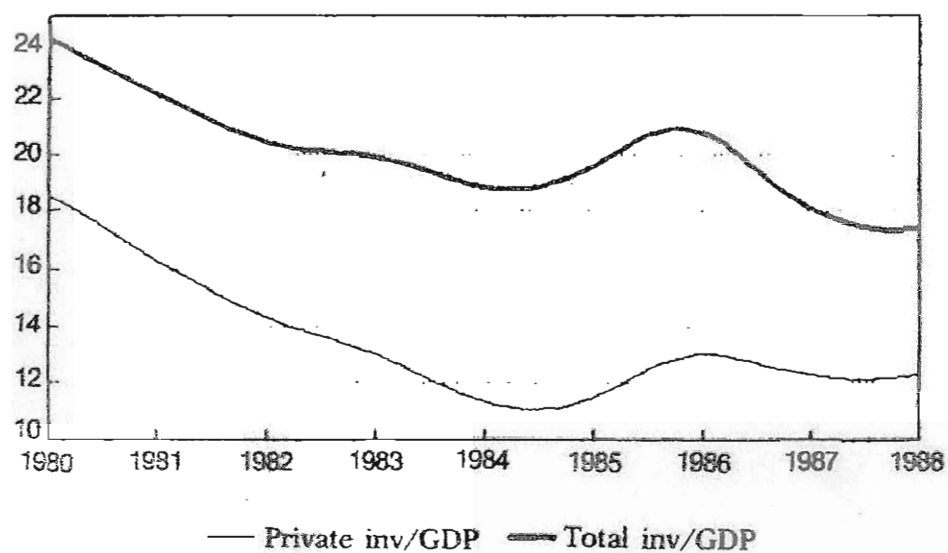
Source: OECD.

GRAPH 6*a*

RATIO OF CONSUMPTION TO GDP
(in % of GDP)

— Private cons/GDP   — Total cons/GDP
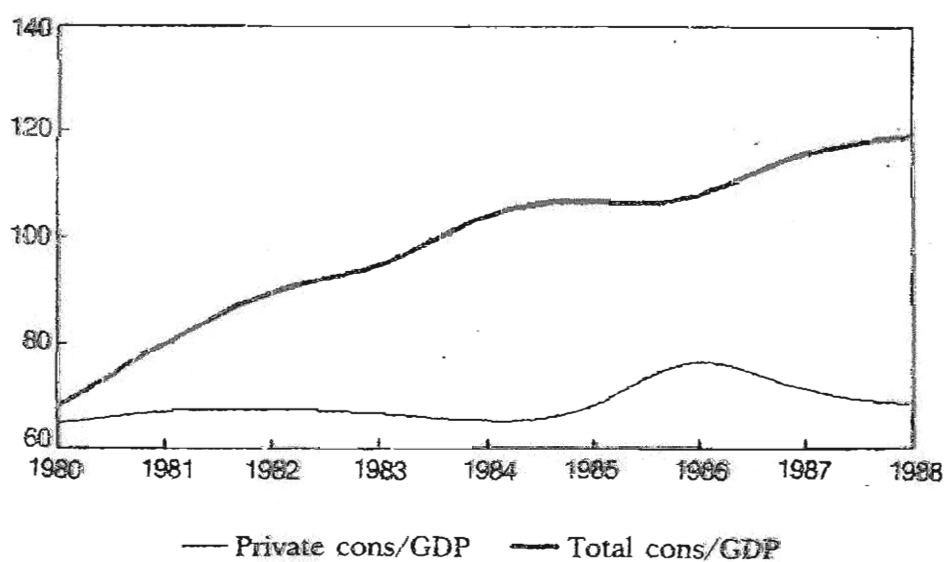
Source: OECD.

GRAPH 6*b*

RATIO OF IMPORTS AND EXPORTS TO GDP
(in % of GDP)

—— Imports/GDP —— Exports/GDP
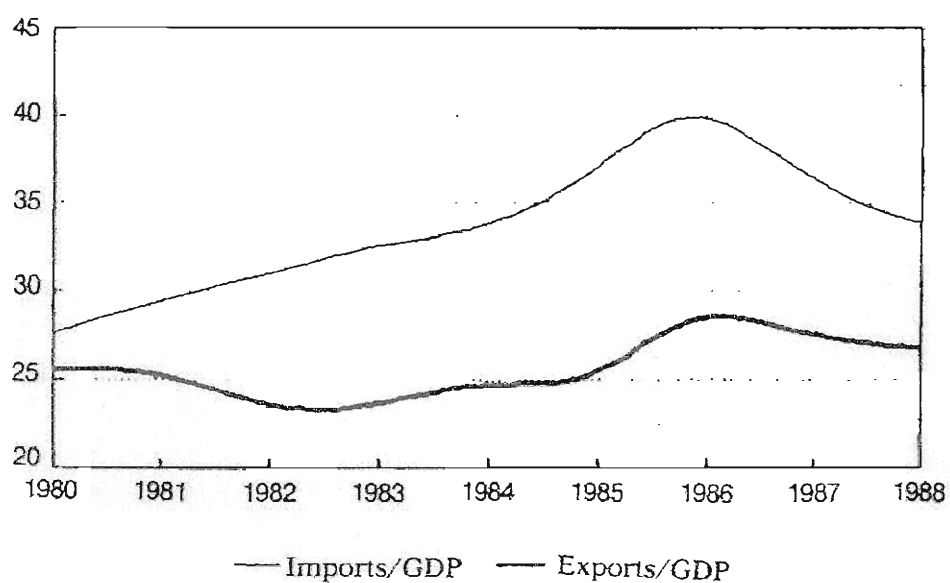
Source: OECD.

GRAPH 6*c*

RATIO OF NET FACTOR INCOME TO GDP
(in % of GDP)

▬ NFI/GDP
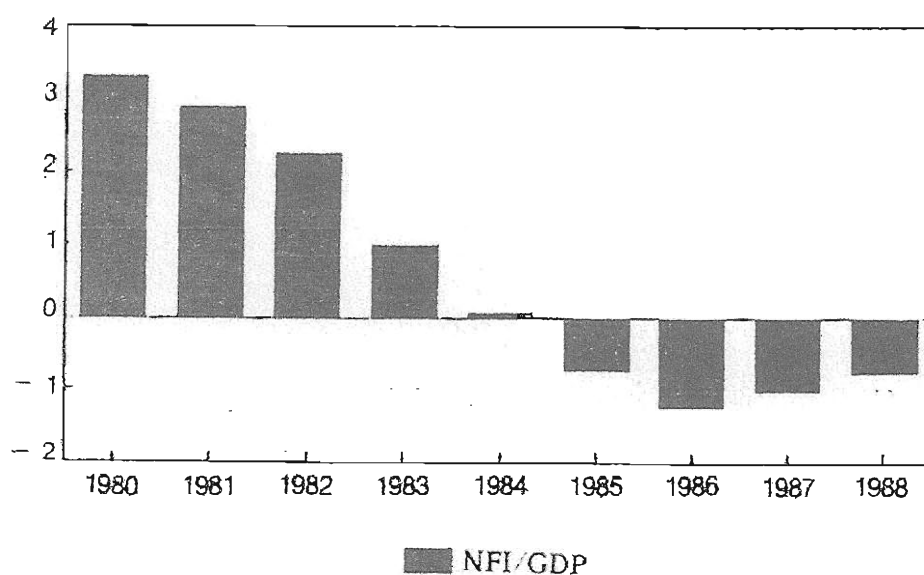
Source: OECD and IMF.

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GRAPH 7

GREECE AND MEXICO:
EXTERNAL DEBT, 1989 AND 1982

In % of GDP

Greece: debt/GDP, 1989   Mexico: debt/GDP, 1982
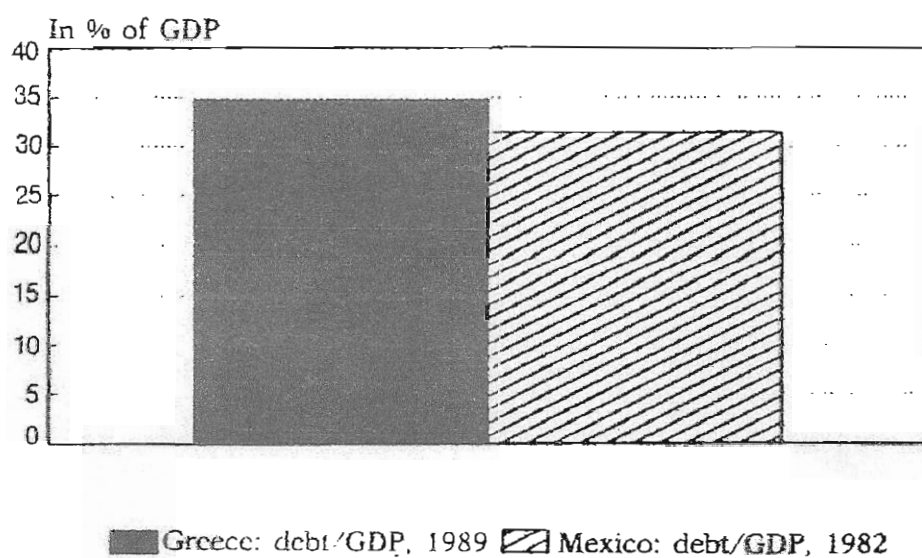
Source: WORLD BANK and BANK OF GREECE.

GRAPH 7a

GREECE AND MEXICO:
DEBT SERVICE RATIO, 1989 AND 1982

In % of exports

Greece: DS ratio, 1989   Mexico: DS ratio, 1982
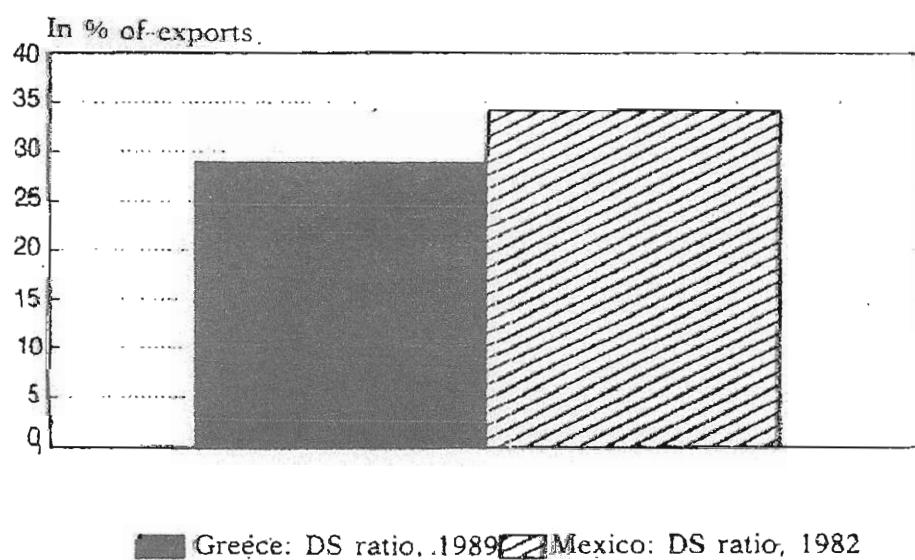
Source: WORLD BANK and BANK OF GREECE.

GRAPH 8

GREECE AND TURKEY:
EXTERNAL DEBT, 1989 AND 1978

In % of GDP

■ Greece: debt/GDP, 1989 |....| Turkey: debt/GDP, 1978
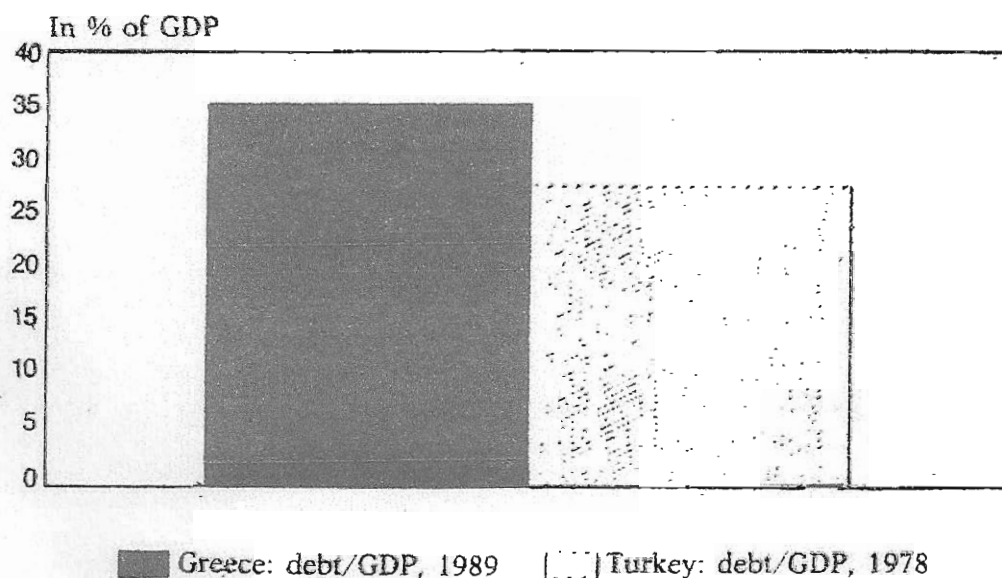
Source: WORLD BANK and BANK OF GREECE.

GRAPH 8*a*

GREECE AND TURKEY:
DEBT SERVICE RATIO, 1989 AND 1978

In % of exports

■ Greece: DS Ratio, 1989 |...| Turkey: DS Ratio, 1978
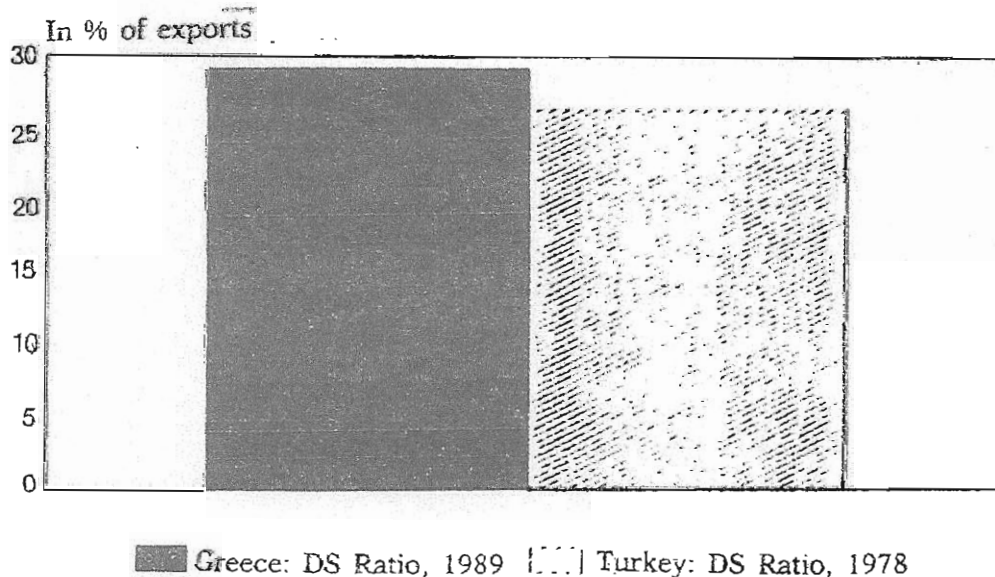
Source: WORLD BANK and BANK OF GREECE.

This raises the moral hazard issue: To what extent has Greece's membership in the EC (which coincided with the adoption of unsustainable fiscal policies in 1981) helped preserve access to financial markets? This question cannot be answered on the basis of the information contained on Graph 7 and 8 alone. But the maintainance of access to external financing in the face of ever-growing disequilibria in the 1980s suggests that capital markets may not base their lending decisions on country risk analysis alone; they may be more willing to lend to an EC member than to non-members in similar circumstances if they perceive the EC as a lender of last resort through its medium-term support facility or other means. If so, the case for the Delors Committee proposal to impose limits on budget deficits in the context of the EMU be strengthened.

Turning to structural issues, it should first be noted that budgetary outlays in Greece do not adequately capture the size of the government in terms of its impact on the economy. Numerous regulatory impediments to market entry, exit and competition raise the cost of producing goods and services, thus shifting the burden of government intervention from taxpayers to consumers and producers. By contrast, over the past decade most OECD countries have reassessed the cost of direct and indirect government involvement in the management of productive activities; they now perceive the role of government to be the improvement in the functioning of markets and the creation of an economic environment that is conducive to risk-taking and rapid adjustment to changes in market conditions. Indeed, this view underlies the EC internal market program which is, in effect, a massive deregulation program.

The resulting trend toward deregulation and privatization in virtually all OECD countries in the 1980s is not apparent in Greece. The economy remained highly regulated through price, credit, and exchange controls. Public utilities as well as air and rail transport remained government monopolies, promoting overstaffing and inefficiency. In addition, the state continued to be heavily involved in industrial production by controlling 56 manufacturing firms, accounting for about a third of industrial output, in which state-owned banks have a controlling interest. Cumulative losses of these firms since 1983 are estimated at $1.2 billion (3% of GDP), not

counting numerous loan capitalizations which have reduced the profitability of state-owned banks. These losses should in principle be added to the fiscal deficit to get a more complete picture of the size of the required fiscal adjustment. Although direct interveniton by the government in the pricing and employment policies of these firms has not been conducive to a turnaround in their profit position, about half of them have been declared non-viable even in the absence of restrictive government regulations which limit their profitability.

Another area in which the efficiency of resource use could be improved is the tax system, which is far from neutral in its resource allocation effects. The OECD notes the large divergence between tax rates, which remain at or above the OECD average, and tax receipts relative to the taxable base, which are below the OECD average because of numerous exemptions and tax benefits granted to both households and corporations (OECD [12]). The tax base is further reduced by statutory exemptions for some groups (e.g. farmers, who are not subject to income tax) and inadequate enforcement of tax laws for others (e.g. professionals who routinely understate their incomes). In addition to its resource allocation effects, a broadening of the tax base and a removal of tax exemptions would make any stabilization program more even-handed and therefore more easily sustainable.

3. - Fiscal Deficits and Macroeconomic Targets

This paragraph presents an analytical framework that can be used to calculate the sustainable deficit given certain macroeconomic targets. The framework draws on the theoretical literature relating public deficits to inflation (Phelps [13]; Fischer [10]; Buiter [4]; Drazen and Helpman [9]), and on the framework used by Anand and Wijnberger [1] and [2] to assess the sustainability of fiscal policy in Turkey.

We start with the budget constraint of the public sector relating public spending to available sources of financing:

(1) $$D + iB + i^* B^* E = \Delta B + \Delta B^* E + \Delta DCg$$

On the LHS of *(1)* is the public sector deficit (PSBR): the primary deficit D, plus interest payments on domestic (B) and foreign (B^*) debt.

E is the nominal effective exchange rate and i and i^* are the domestic and foreign nominal interest rates. On the RHS of *(1)* are the financing items, which consist of changes in domestic and foreign debt plus domestic credit to the public sector by the Central Bank, ΔDCg.

To consolidate the public sector with the Central Bank, to which a portion of government expenditures may be shifted through accounting practices, we can introduce a simple Central Bank balance sheet identity:

(2a) $$M = C + RR$$

(2b) $$M = DCg + NFA^* E - NW$$

Base money M equals currency in circulation C plus required reserves RR on the liability side of the Central Bank balance sheet (equation *(2a)*), and it is also equal to domestic credit to the government plus net foreign assets minus the Central Bank's net worth NW on the asset side (equation *(2b)*). Assumming that the Central Bank earns no interest on its loans to the government, Central Bank profits will be equal to interest earned of foreign exchange reserves, $i^* NFA^* E$ (3). Subtracting these profits from the PSBR, and its counterpart, ΔNW, from from the increase in government liabilities in equation *(1)* yields:

(3) $$D + iB + i^* B^* E - i^* NFA^* E =$$
$$= \Delta B + \Delta B^* E + \Delta DCg - \Delta NW$$

Noting from *(2b)* that $\Delta DCg = \Delta M - \Delta NFA^* E + \Delta NW$ at any given exchange rate E, and substituting in (3) yields:

(4) $$D + iB + i^* (B^* - NFA^*) E =$$
$$= \Delta B + (\Delta B^* - \Delta NFA^*) E + \Delta M$$

Equation *(4)* establishes a dirct link between the fiscal deficit on the *LHS* and base money, on which the inflation tax is levied, on the

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(3) Gains or losses on foreign exchange reserves due to exchange rate movements, which also affect Central Bank profits, are introduced at a later stage in the analysis. At this stage it is assumed that the exchange rate remains fixed.

RHS. The equation thus considers the inflation tax on the monetary base as fiscal revenue accruing to the government.

Next, we express equation *(4)* in real terms, noting that $E = ep/p^*$ (where e is the real effective exchange rate). It is also useful to decompose the nominal interest rate, i, into a real component, r, and an inflation component, $\dot{p}$. Using lower-case letters to denote real variables:

(5)
$$d + (r + \dot{p}) b + (r^* + \dot{p}^*) (b^* - nfa^*) e =$$
$$\Delta b + (\Delta b^* - \Delta nfa^*) e + \Delta M/p$$

where: $\qquad i = r + \dot{p}$ and $i^* = r^* + \dot{p}^*$.

A final adjustment that needs to be made is to include in equation *(5)* capital gains or losses on the net foreign debt due to changes in the real exchange rate. These losses can be expressed as $\Delta e (b^* - nfa^*)$, or equivalently as $\dot{e} (b^* - nfa) e$. Adding this expression to both sides of equation *(5)*, and using the identity:

(6)
$$\Delta[(b^* - nfa^*) e] =$$
$$= (\Delta b^* - \Delta nfa^*) e + \dot{e} (b^* - nfa^*) e$$

to simplify the *RHS*, we get:

(7)
$$d + (r + \dot{p}) b + (r^* + \dot{p}^* + \dot{e}) (b^* - nfa^*) e =$$
$$= \Delta b + \Delta[(b^* - nfa^*) e] + \Delta M/p$$

Equation *(7)* states that the fiscal deficit in real terms equals changes in the real value of domestic and foreign debt plus revenue from monetization (the «tax» levied on the monetary base). A depreciation in the real exchange rate ($\dot{e} > 0$) as part of a stabilization program raises the cost of servicing the foreign debt in domestic currency terms and correspondingly reduces the primary deficit, d, compatible with the available financing under different macro targets.

The last term in equation *(7)*, which represents the portion of the deficit financed through inflation; can be decomposed in two parts: seigniorage, $\Delta n = \Delta (M/p)$, and the inflation tax, $\dot{p}m$. Although these terms are often used interchangeably to refer to total revenue ac-

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cruing to the government through inflation, it is useful to distinguish between the two insofar as revenue from seigniorage depends primarily on the growth rate and accrues to the government even in the absence of inflation, while revenue from the inflation tax depends primarily on the inflation rate.

Some authors have suggested that a further adjustment needed to establish a link between the fiscal deficit and the authorities' inflation target is the adoption of an «operational» deficit concept (Anand and van Wijnbergen [1]). It is now widely accepted that in an inflationary environment, interest payments partly reflect compensation for the erosion of the real value of the outstanding debt; they thus constitute an implicit repayment of principal which represents a financing item and should be excluded from the fiscal deficit (4). Netting out of the fiscal deficit the inflation component of interest payments yields the socalled operational deficit, which equals the conventional deficit as defined on the *LHS* of equation (5) minus $\dot{p}b$ and $\dot{p}^*$ $(b^* - nfa^*)$; correspondingly, Δb and $(\Delta b^* - \Delta nfa^*)$ would be defined as *net* of the inflation component of net government borrowing on the *RHS*. However, it has been argued that this may give a misleading picture of the sustainability of fiscal deficits under any of the following behavioral assumptions: *a)* money illusion causes holders of domestic debt to spend rather than save the inflation component of interest payments, thus fueling inflation under a policy of monetary accommodation; *b)* inflation is perceived to increase the risk of default, thus causing bond holders to demand a higher real premium; if so, the inflation component of interest payments cannot be refinanced on existing terms; and *c)* a highly liquid domestic debt is used as a substitute for money (Tanzi *et* Al [15]). While the third argument can be expected to be relevant only in situations of hyperinflation in which debt is replaced for money for transactions purposes, the first two could plausibly apply to relatively low-inflation countries. It can thus

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(4) The rationale for the exclusion of the inflation component of interest payments from the fiscal deficit is that its impact on aggregate demand is different from the impact of other components of fiscal spending: insofar as it merely safeguards the real value of existing wealth without increasing it, it is more likely to be saved than spent. This argument implicitly assumes that the inflation component of interest payments can be refinanced on existing terms; if not, then it will have an impact on real interest payments and thus on the operational deficit.

be argued that although in an inflationary situation the conventional fiscal deficit may overstate the size of the required adjustment, the operational deficit will almost certainly understate the size of that adjustment. The calculations shown in the next paragraph are therefore carried out on the basis of the conventional deficit.

The next step needed to compute the sustainable deficit given certain macro targets is to incorporate these targets in equation *(7)*. Sustainability is usually defined with reference to the scale of borrowing to which it gives rise and the terms of such borrowing: a sustainable deficit is one that can be financed through borrowing at market rates indefinitely. An additional constraint on the financeable (as opposed to sustainable) deficit is introduced if the authorities target a reduction in the inflation rate, which limits financing through money creation.

An increase in total debt relative to GDP cannot be sustained indefinitely without a rise in borrowing costs, crowding out of the domestic private sector, and eventual loss of access to financing if there is a perceived risk of default. Accordingly, two constraints must be introduced in equation *(7)*, namely, stabilization of the internal and external debt relative to GDP. These constraints can be expressed as:

(8a)
$$\Delta b = \dot{y} b$$

(8b)
$$\Delta \left[(b^* - nfa^*)\, e \right] = (\dot{y} - \dot{e})(b^* - nfa^*)$$

where $\dot{y}$ is the growth rate of real GDP. Incorporating *(8a)* and *(8b)* in *(7)* and noting that revenue from seigniorage, Δm, will equal $\dot{y} m$ in the steady state, yields:

(9)
$$d + (r + \dot{p})\, b + (r^* + \dot{p}^* + \dot{e})(b^* - nfa^*)\, e =$$
$$= \dot{y} b + (\dot{y} - \dot{e})(b^* - nfa^*) + (\dot{y} + \dot{p})\, m$$

Equation *(9)* states that the primary deficit plus interest payments on domestic and foreign debt must equal new borrowing compatible with the maintainance of the existing internal and external debt/GDP rations, plus revenues from monetatization (with all variables expressed in real terms). A debt strategy involving a reduction in debt relative to GDP would obviously reduce the financeable deficit further.

It is clear from equation *(9)* that if r, $r^* > \dot{y}$, the deficit will rise faster than available sources of financing, ceteris paribus. It is also clear that a real depreciation ($\dot{e} > 0$) will unambiguously reduce the financeable deficit by raising the local currency value of interest payments on external debt on the *LHS*, and also by reducing the new external debt that can be contracted at a constraint debt/GDP ratio on the *RHS*. The opposite policy (real appreciation, i.e. $\dot{e} < 0$) would alleviate the financing constraint in the short term for any given primary deficit, but would undermine confidence in the sustainablility of exchange-rate policy over the medium term.

The last term on the *RHS* of *(9)* must be evaluated at its equilibrium value, i.e. at the point where the supply of real balances, m, equals the demand for real balances at the inflation rate targeted by the authorities. To ascertain what this level is, we need an estimate of the demand for money function. We turn to this now.

4. - Money Demand, Inflation Revenues, and Fiscal Sustainability

This paragraph derives estimates of the financeable deficits in Greece under alternative target inflation rates and assuming that internal and external debt remain constant relative to GDP at their 1989 levels. Variants of this scenario are presented based on different GDP growth rates and different assumptions about movements in the real exchange rate.

The following Cagan-type specification of the demand for base money is used:

$$(10) \qquad\qquad m = a_0\, y^{a1}\, e^{a2c}$$

where $m = M/p$ are real money balances, y, is real income, and c is the expected return (or negative opportunity cost) of holding money, which is a function of the expected rate of inflation, $\dot{p}^e$, or the nominal interest rate on interest-bearing assets, i, whichever is higher. Deposit rates in Greece have remained negative in real terms throughout the 1980s, and should thus not affect the demand for base money.

Alternative financial assets offering market-related returns did not exist until 1985, when T-bills and bonds of short maturity carrying positive real returns started being sold to the nonbank public, while deposit rates continued to be set administratively. The following equation was therefore estimated over the period 1977:2 to 1988:1:

$$(11) \qquad ln\,m_t = -\,5.66 + 0.54\,ln\,y_t - 0.52\,\dot{p}_t +$$
$$(-\,6.04)\quad(6.77)\qquad(-\,1.41)$$
$$+\,-\,0.71\,DUM + 0.72\,ln\,m_{t-1}$$
$$(-\,3.06)\qquad(9.15)$$

$$\bar{R} \qquad = 0.753$$
$$DW \qquad = 2.07$$
$$SEE \qquad = 0.053$$

When the rate of inflation increases, the demand for money normally diminishes (or velocity rises), eroding the base on which the inflation tax is levied. The coefficient on the expected inflation rate (assumed equal to the actual rate) thus has the expected sign. A *dummy* variable was introduced to capture the effect of the introduction of T-bill sales to the nonbank public since 1985:3. The dummy is significant and has the expected negative sign, indicating that the introduction of a financial asset with a positive real return has reduced the desired money holdings at any given inflation rate and real income level; a higher inflation rate would thus be required to derive any given amount of revenue from the inflation tax. Finally, the estimated money demand equation assumes a partial adjustment of actual money balances to their desired level, captured by the lagged real money balances term, m_{t-1}. When the (administratively set) deposit interest rate is inserted in equation (11), it is not significant either individually or jointly with $\dot{p}$.

Using the target values for internal and external debt growth incorporated in equation (9), the elasticity estimates obtained from equation (11), and estimates of inflation revenues derived from the banking system, we can now estimate the sustainable deficit corresponding to different target inflation rates.

TABLE 1

GREECE: ACTUAL AND SUSTAINABLE DEFICIT IN 1989
(in percent of GDP)

	Deficit	
	actual	sustainable (1)
Revenues from monetization	5.6	5.6
Seigniorage	0.3	0.3
Inflation tax	5.3	5.3
Domestic borrowing	13.3	1.1
Foreign borrowing	2.4	0.6
At fixed *e*	(3.2)	(0.6)
Capital gain (−)/loss (+)	(−0.8)	(−)
Total financing	21.3	7.3

(1) Assumes GDP growth and inflation at their actual levels of 18 and (2) percent, respectively, and stabilization of both domestic and external debt relative to GDP at their end-1988 levels.

Table 1 compares the actual and sustainable deficit in Greece in 1989 at the present inflation rate of 18% (5). The actual public sector deficit reached 21.3% of GDP, about one fourth of which was financed through revenues from monetization. At the same inflation rate, stabilization of the internal and extenal debt relative to GDP would have required a deficit of only 7.3% at the actual growth rate of 2%. Underlying this estimate is the assumption that the real appreciation which occurred in 1989 cannot be sustained without undermining confidence in the consistency between fiscal and monetary policy.

Turning to projected outcomes, Table 2 shows the estimated financeable deficit at different inflation rates, assuming the domestic and external debt stabilize at their end-1989 level. At a 2% growth rate, stabilization of the external debt at its end-1989 level of 33% permits external financing of 0.7% of GDP per year. Similarly, stabilization of the domestic debt at its end-1989 level of 65% permits domestic borrowing of 1.3% of GDP per year.

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(5) The figures presented in Tables 1-3 are expressed as a percent of GDP. This involves a straightforward normalization of equation (9) using real GDP.

TABLE 2

GREECE: FINANCEABLE DEFICIT
UNDER DIFFERENT INFLATION TARGETS (1)
(in percent of GDP)

	$\dot{p} = 18$	$\dot{p} = 12$	$\dot{p} = 6$
Revenues from monetization	5.6	4.0	2.4
Seigniorage	0.3	0.4	0.5
Inflation tax	5.3	3.6	1.9
Domestic borrowing	1.3	1.3	1.3
Foreign borrowing	0.7	0.7	0.7
Total financing	7.6	6.0	4.4

(1) Assuming GDP growth at 2 percent, no change in the real exchange rate, and stabilization of both domestic and external debt relative to GDP at their end-1989 levels.

The third possible source of financing, monetization, provides the revenues shown on Table 2 at different target inflation rates. This is broken down in two parts: *ceteris paribus*, GDP growth permits an increase in real money balances with no impact on inflation. This is revenue from seigniorage. In Greece this can be estimated at 0.3% at a growth rate of 2% and inflation at 18%. A lower inflation rate would increase the demand for real balances at any given real income level, thus raising the revenue from seigniorage. The second source of revenue from inflation is the inflation tax levied on money balances. Inflation reduces the demand for real money balances at any given real income level. However, moneyholders must build up their nominal money balances to offset to some degree the erosion of their real balances through inflation. This buildup in money balances represents revenue from the inflation tax. As long as we are operating on the left side of the inflation tax Laffer curve, revenue from the inflation tax will rise with the inflation rate, and correspondingly decline in a period of disinflation. Revenue from this source in Greece is estimated to decline from 5.3% of GDP at the current inflation rate of 18% to 1.9% of GDP at an inflation rate of 6%.

On this basis, the financeable deficit is estimated at 4.4% of GDP at the EC average inflation rate of 6%. A higher growth rate would ease the debt burden by permitting higher borrowing at constant debt

ratios and by providing greater revenues from seigniorage. By contrast, a real depreciation would reduce the deficit that can be financed at any given inflation and growth rates by raising the cost of debt service in local currency. The financeable deficit based on different assumptions about growth, inflation and real depreciation are shown on Table 3. At the present inflation rate of 18%, the required deficit reduction amounts to 14% of GDP. A doubling of the growth rate would reduce the required reduction to just under 10% of GDP. By contrast, a 4% real depreciation would raise this reduction to nearly 16% of GDP at the present growth rate.

The estimates presented above do not depend on how long it takes to reach a sustainable fiscal position. The cost of waiting is reflected only in the rise of interest obligations relative to GDP that will occur if the constraints on debt accumulation are not observed. A rise in interest obligations would make it more difficult to reduce the fiscal deficit because it implies a correspongly larger reduction in the primary deficit relative to GDP.

Broadly similar conclusions about orders of magnitude for the required adjustment are reached by Catsambas [5]. Using a financial programming framework base on alternative «inflation target-

TABLE 3

GREECE: REQUIRED DEFICIT REDUCTION
UNDER ALTERNATIVE MACRO TARGETS
(in percent of GDP)

		$\dot{y} = 2,\ \dot{e} = 0$	
Inflation target	18	12	6
Required deficit reduction	14	15.5	17
		$\dot{p} = 18,\ \dot{e} = 0$	
Growth target	2	3	4
Required deficit reduction	14	12	10
		$\dot{y} = 2,\ \dot{p} = 18$	
Real depreciation target	0	2	4
Required deficit reduction	14	15	16

required deficit» simulations, his analysis confirms the tradeoffs presented in Tables 2 and 3. Clearly, changes in growth and inflation rates will affect not only the sustainable deficit but also the actual deficit, through changes in the taxable base and in cyclical components of spending. A higher growth rate will reduce the actual deficit relative to GDP, while a lower inflation rate will have an ambiguous effect depending on the degree of indexation of the tax and financial systems and the strength of the «Tanzi effect».

5. - Conclusions

This paper has used a simple framework to evaluate the size of the fiscal adjustment required to reach a sustainanble fiscal position in Greece. The discrepancy between the actual and sustainable deficit is estimated at 14% of GDP at the present inflation rate of 18% and growth rate of 2%. A credible commitment to join the EMS — as required under the first stage of EMU — would require a further reduction in the fiscal deficit to a level compatible with a reduction in inflation to the EC average level. Opting for a «hard currency» policy would entail a loss of revenue from monetization estimated at 3% of GDP. This revenue loss would raise the size of the required fiscal adjustment by an equivalent amount. These figures provide a basis for evaluating the feasibility and desirability of joining the EMU or for estimating the compensation required (say, through the EC regional and social funds) to make up for the foregone inflation revenues.

The analysis presented here could be extended by addressing the moral hazard issue in greater depth. It has been suggested in this paper that Greece has had greater access to external financing compared to other debtors with a similar external position outside the EC. This would indicate that the moral hazard issue may arise even in the absence of EMU, just by virtue of membership in the EC. If so, the case for systemic limitation of fiscal autonomy under the EMU would be strengthened.

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