September 1998

IMF Staff Country Report No. 98/100

Greece: Selected Issues

This Selected Issues report on Greece was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with this member country. As such, the views expressed in this document are those of the staff team and do not necessarily reflect the views of the Government of Greece or the Executive Board of the IMF.

Copies of this report are available to the public from

International Monetary Fund • Publication Services
700 19th Street, N.W. • Washington, D.C. 20431

Telephone: (202) 623-7430 • Telefax: (202) 623-7201
Telex (RCA): 248331 IMF UR
Internet: publications@imf.org

Price: $15.00 a copy

International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

GREECE

Selected Issues

Prepared by Ioannis Halikias, Mark Lutz, and Nicolas Sobczak (EU1)

Approved by European I Department

July 22, 1998

Contents Page

Tables

Figures

Text Box

Statistical Appendix Tables

Table 1. Greece: Selected Economic Indicators
(Percentage changes, unless otherwise indicated)

	1992	1993	1994	1995	1996	1997 Est.	1998 Proj.
Domestic economy							
GDP	0.7	-1.6	2.0	2.1	2.7	3.5	3.2
Domestic demand	-0.6	-0.9	1.2	3.2	3.3	3.9	3.2
Private consumption	2.4	-0.8	2.1	2.2	2.3	2.5	2.0
Public consumption	-3.0	2.6	-1.1	8.0	0.5	-0.1	0.5
Gross fixed capital formation	-3.2	-3.5	-2.8	7.3	9.4	10.9	8.4
Private	-6.3	-5.0	-2.3	6.0	9.0	8.3	7.0
Public	8.2	1.1	-4.2	11.0	10.3	18.2	12.0
Change in stocks (contribution)	-1.3	0.0	0.5	-0.7	0.0	0.3	0.3
Foreign balance (contribution)	1.3	-0.6	0.7	-1.3	-0.9	-0.6	-0.2
Exports	10.4	-3.3	6.5	1.0	0.2	5.2	6.7
Imports	1.3	0.2	1.3	6.1	3.9	5.9	5.4
Unemployment rate	8.7	9.7	9.6	10.0	10.3	10.3	10.2
Average compensation of employees (economy wide)	11.8	9.8	11.9	12.6	11.5	10.7	6.0
Unit labor costs (economy wide)	12.6	12.7	11.7	11.3	9.9	6.5	3.7
Unit labor costs (manufacturing)	10.0	10.1	8.7	11.3	7.7	6.5	3.7
Consumer prices, period average	15.9	14.4	10.9	8.9	8.2	5.5	5.0
Consumer prices, end of period	14.4	12.1	10.7	7.9	7.3	4.7	4.7
GDP deflator	14.8	14.5	11.3	9.8	9.1	6.9	4.9
External accounts (in percent of GDP)							
Trade balance (national accounts)	-13.3	-13.4	-11.9	-12.3	-12.2	-11.9	-12.0
Current account (national accounts)	-2.0	-2.6	-0.7	-2.1	-2.6	-2.4	-2.3
Current account (national accounts including EU capital transfers) 1/	-1.0	-1.3	0.5	-0.9	-0.8	-0.3	0.2
Current account (settlements)	-2.1	-0.8	-0.1	-2.5	-3.7	-4.0	-3.6
Foreign exchange reserves (US$ billions)	4.6	7.6	14.3	14.6	17.3	12.4	18.1 2/
Drachma/ECU (period average)	-8.7	-8.0	-6.7	-4.1	-0.6	-2.3	-6.3 3/
NEER	-7.8	-10.3	-7.2	-2.7	-0.8	-1.5	-9.2 4/
REER (consumer prices)	3.1	-0.5	-1.1	3.4	4.3	0.9	-9.2 5/
REER (manufacturing ULCs)	-1.3	-3.2	1.7	6.0	5.7	4.0	-7.7 4/
Public finances (in percent of GDP)							
General government							
Current revenues	33.7	35.0	36.6	37.5	37.6	38.2	38.6
Current expenditures	40.8	43.0	43.7	44.6	42.7	40.5	39.9
Current primary expenditures	29.1	30.3	29.6	31.7	30.8	30.9	30.4
Interest expenditures	11.7	12.8	14.1	12.9	12.0	9.5	9.5
Net capital spending	5.7	5.7	2.8	3.2	2.3	1.8	1.2
Balance	-7.1	-13.8	-10.0	-10.3	-7.5	-4.0	-2.5
Primary balance	-1.1	-1.0	4.1	2.6	4.5	5.5	7.0
Structural primary balance	-1.5	-0.3	4.7	3.2	4.9	5.6	6.9
Debt 6/	89.0	111.6	109.6	110.1	111.6	108.6	107.0
Financial variables							
M3 7/	14.4	15.0	8.8	10.3	9.3	9.5	2.8 8/
M4 7/	19.2	15.3	13.9	8.2	12.0	-1.6	-1.3 8/
Domestic credit 9/	18.0	13.3	8.8	7.9	5.9	9.6	9.2 8/
3-month treasury bill rate (average)	17.7	18.2	18.2	14.3	12.0	10.4	11.5 10/
12-month treasury bill rate (average)	21.5	21.3	19.0	15.5	12.8	10.4	11.7 11/
Short-term bank lending rate (average)	28.7	28.4	26.4	21.1	20.2	19.1	19.3 12/

Sources: Data provided by the authorities; and Fund staff estimates and projections.

1/ Based on Ministry of National Economy data on an accrual basis.
2/ End-May.
3/ End-June compared with end-December.
4/ May compared with December.
5/ April compared with December.
6/ New definition as of 1990, including military debt and short-term liabilities to the Bank of Greece. Break in series in 1993, when liabilities to the central bank were included in the stock of debt; and in 1994, when government foreign exchange liabilities to the Bank of Greece were replaced by government bonds (an increase in the debt equal to 10 percent of GDP; see SM/95/179, 7/25/95).
7/ M3 is defined as the sum of currency, private deposits, bank bonds, and repos; M4 also includes private sector holdings of T-bills and government bonds of maturity of up to one year.
8/ 12-month change in May.
9/ Includes capitalized and accrued interest on consolidation bonds held by commercial banks.
10/ Latest auction July 13, 1998.
11/ Latest auction June 29, 1998.
12/ May average.

INTRODUCTION AND OVERVIEW

1. Greece currently finds itself at a critical juncture, facing important long- and short-term challenges. After a disappointing growth performance during the 1980s, growth has recently picked up, exceeding the EU average. The sustainability of such growth rates would ensure the real convergence relative to EU partners that has to date largely eluded Greece, while also helping to place the public finances on a sound medium-term footing. It is thus of interest to determine to what extent recent trends represent a fundamental or underlying shift in growth performance, rather than a purely cyclical upswing. At the same time, Greece faces the historic challenge of securing EMU participation by 2001. Among the Maastricht criteria, achieving the inflation reference value appears to be the most demanding, in light also of the effects stemming from the drachma's recent devaluation. In this context, gaining insight into the short-term prospects for inflation acquires particular relevance. This paper attempts an empirical investigation of these issues.

2. Chapter I (by Mark Lutz) explores the determinants of Greece's potential output, an exercise that could shed light on its current cyclical position, as well as on its medium-term growth prospects. To that end, a production function is estimated, with capital and labor as factors of production and time varying total factor productivity. The estimation results suggest that the output gap has been closing in recent years, with output projected to be slightly above potential in 1998. The results also suggest that the bulk of the deceleration of potential output growth since the beginning of the 1980s is attributable to a stagnation of total factor productivity, rather than to the rate of factor accumulation. In order to better understand past trends, but also to provide a basis for medium-term projections, the chapter explores the determinants of total factor productivity growth. Estimation results suggest that it is related to public capital formation, the share of public sector employment in total employment (as a proxy for the size or role of government), and inflation—although this latter conclusion is less robust. On the basis of these results, it can be conjectured that plans to maintain high levels of public investment while reducing the role of the state in other sectors of the economy, together with product market liberalization, can help sustain a higher rate of total factor productivity growth. At the same time, labor market reform, by lowering structural unemployment and raising labor participation, can also contribute to high rates of potential output growth over the medium term. All these ingredients will be essential to achieving the growth rates postulated in the new convergence program.

3. Chapter II (by Ioannis Halikias and Nicolas Sobczak) explores the impact of changes in the drachma's exchange rate on inflation, an issue of particular interest given the recent devaluation. A number of alternative empirical approaches are pursued, including single equation specifications of price and wage behavior, a simple structural model, and a vector autoregressive system. The empirical result that emerges, in a fairly robust manner, is that exchange rate changes have tended to entail a strong and persistent impact on inflation. In turn, an important factor through which these effects have been transmitted appears to relate to wage behavior: the chapter provides evidence of extensive real wage rigidity, with a tendency on the part of wage setters to target the level of the real wage and correct for past

inflation surprises. Moreover, the results point to appreciable hysteresis as regards the impact of shifts in aggregate demand on inflation. In assessing the likely impact of the recent national wage agreement, it is argued that, while moderate by historical standards, it does not appear to signal a decisive break with the past: model simulations suggest that, even under rather optimistic assumptions regarding lower-tier wage outcomes, the devaluation shock could entail a wage-price dynamic that would put the Maastricht inflation target at risk—in this regard, the catch-up clauses embodied in the wage agreement pose the most significant threat. Finally, a short discussion of the successful disinflation effort in the case of other European countries that underwent large devaluations in the 1990s suggests that their situation was distinct from that now facing Greece, as a set of factors that were central to their success appear to be largely absent in the current Greek context. Based on these considerations, it is concluded that additional fiscal retrenchment would be required to safeguard the inflation target: the size of the necessary fiscal adjustment is estimated to be at least 1 percentage point of GDP, front-loaded during 1998–99.

I. Potential Output and the Output Gap in Greece: A Third Face for Janus?[1]

A. Introduction

4. In a recent paper, Alogoskoufis (1995) argued that, like the Roman god Janus, the post-war Greek economy had displayed two faces. Prior to 1974, economic growth was second only to Japan among OECD members, with inflation rates that were at or below those of its partners. Subsequently, in contrast, the growth rate collapsed, and inflation shot up to 15–20 percent and remained, until recently, stubbornly high. Since 1994, growth has again picked up and inflation moderated, although it remains unclear whether this portends a "third face" for the Greek economy.

5. This chapter presents estimates of potential output and the output gap for Greece, as a means to gauge the appropriateness of the stance of macroeconomic policies, and to assess the prospects for real convergence in living standards with those of EU partners. It is of course necessary to bear in mind throughout that all estimates of potential output are subject to significant margins of uncertainty, and need to be supplemented by judgmental considerations. In the specific case of Greece, in addition, data problems (e.g., affecting the capital stock and the labor force survey) compound the traditional difficulties, as do significant regime shifts in the last few decades (including changes in the political system and related policy approaches, membership in the European Community, etc.).

6. The chapter is organized as follows. Section B discusses the method used for estimating potential output and the output gap, namely, the production function approach, and contrasts it with a simple univariate smoothing procedure. Section C discusses measures of potential output and the output gap for Greece, and examines the contributions made by the various productive factors. Section D focuses on the history of and prospects for the growth in total factor productivity, and offers some tentative econometric evidence on factors that may have influenced its performance and that may determine its future evolution. Section E summarizes the main findings.

B. The Production Function Approach

7. There are a variety of approaches to estimating potential output and the output gap, each with its own strengths and weaknesses.[2] One approach that is often used is to smooth the real output series using a Hodrick-Prescott (HP) filter. This procedure minimizes a weighted combination of the gap between actual and trend output and the rate of change of trend

---

[1]Prepared by Mark Lutz.

[2]De Masi (1997) provides an overview of various approaches to estimating potential output that have been used in the Fund. Magnier (1998) includes a discussion of the relative merits of alternate approaches.

output over the sample period. It has the advantage of simplicity, but a number of drawbacks. First, the weight given to minimizing the gap relative to minimizing the variation in trend output is arbitrarily chosen. Second, the technique results in edge-sample biases, although the use of medium-term growth projections can help to reduce the end-sample bias.

8. The approach taken in this chapter is to employ a production function.[3] In its simplest form, output is accounted for by a combination (in a Cobb-Douglas functional form) of labor and capital, as well as the state of technology at each point in time, as follows:

$$Ln(Y) = \alpha Ln(L) + (1-\alpha)Ln(K) + tfp \quad (1)$$

where Y, L and K are real gross domestic product, labor, and the nongovernment capital stock, respectively, α is labor's share in value added and *tfp* is total factor productivity (in log form).[4] Total factor productivity is derived residually by subtracting the weighted contributions of labor and capital.[5] Potential output is computed as:

$$Ln(Y^*) = \alpha Ln(L^*) + (1-\alpha)Ln(K) + tfp^* \quad (2)$$

where tfp^* is trend total factor productivity obtained by smoothing the residuals of equation (1) using the HP filter.[6] L^* is the trend labor input calculated as:

---

[3]Artus (1977) was the first IMF research study to adopt the production function methodology to estimate potential output.

[4]Data for real gross domestic product and the labor force are taken from the OECD Analytical Database, supplemented in later years by Ministry of National Economy estimates and staff projections. Official capital stock data are not available, and were therefore created using a perpetual inventory method, with the initial stocks based upon the level of investment in 1960, the first year of the sample, on depreciation rates provided by Garganas (1992), and on the average growth of real output during the 1950s (from data included in Tsaliki, 1991). Sensitivity of the sources of growth and of the econometric results to variations in the estimated capital stock are discussed in sections C and D, respectively, below.

[5]In the Greek national accounts, the share of dependent labor compensation in output averaged only about one-third during the 1990s, reflecting the large role played by sole proprietorships and the self-employed. The latter sector's incomes are not separated into returns to labor and capital, but are grouped under "property and entrepreneurial income." We have assumed that the overall share of income attributed to labor is 65 percent, the lower end of the 65–75 percent range cited by Giorno and others (1995) as typical for OECD countries.

[6]The smoothing parameter was set at 25, the same level used by the OECD (see Giorno and others, 1995).

$$L^* = LF^*(1-UR^*) \quad (3)$$

where LF^* and UR^* are the trend labor force and unemployment rate, respectively, obtained by smoothing the underlying series using the HP filter.

9. One advantage of the production function approach compared to univariate detrending is that it can "explain" the changes in potential output in terms of changes in its underlying components. It is also preferable to univariate smoothing when examining prospects for potential growth, as it can incorporate anticipated changes in the underlying components (e.g., changes in the labor force participation rate). But it has a number of drawbacks as well. First, the estimates may be sensitive to edge-sample biases of the components, although use of medium-term forecasts may again mitigate this problem. Second, the estimates may also be subject to measurement errors in factor inputs, especially the capital stock.

C. Measures of Potential Output and the Output Gap

10. Estimates of potential output, its growth rate, and the output gap for Greece are presented in Figure 1.[7] The average rate of potential growth has fallen from about 7 percent in the 1960–73 period, to less than 2 percent since the early 1980s.[8] Growth in activity has picked up in recent years, exceeding 2 percent since 1994, and has outpaced the estimated rate of potential growth, although the latter has risen as well. As a result, the output gap is estimated to have largely closed in 1997, with activity set to be slightly (about ¼ percentage point) above potential in 1998. The EU Commission projects negligible slack in 1998, while the OECD estimates an output gap of slightly over 1 percent as persisting in the current year (Table 1).[9] The staff and the EU Commission both project output to exceed potential in 1999 (by about ¾ percent), while the OECD projects a gap of ½ percent of potential GDP.

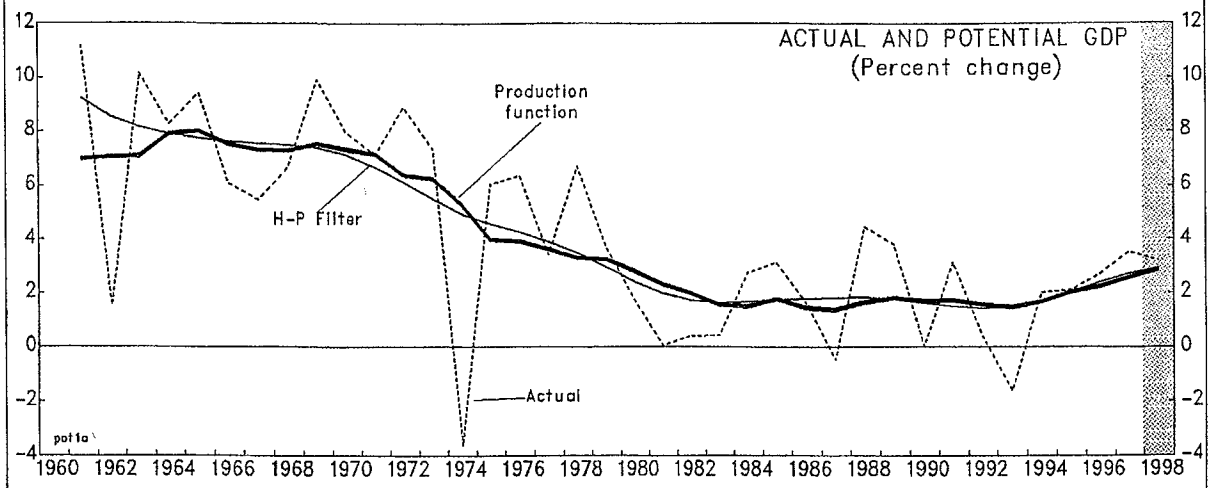
---

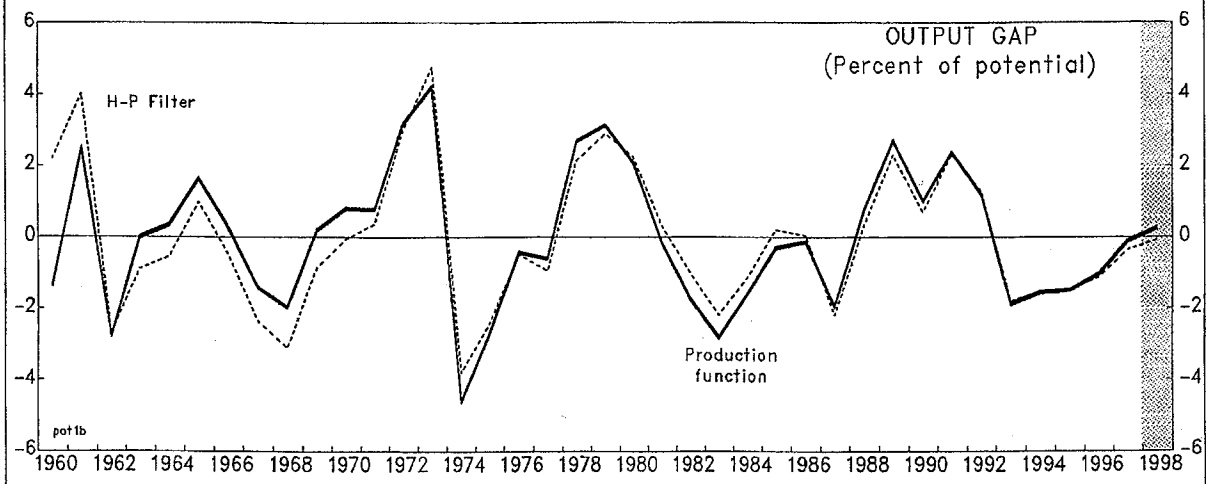
[7]Hodrick-Prescott filters were fit over 1960–99, with staff projections used for the last two years to mitigate the end-sample bias.

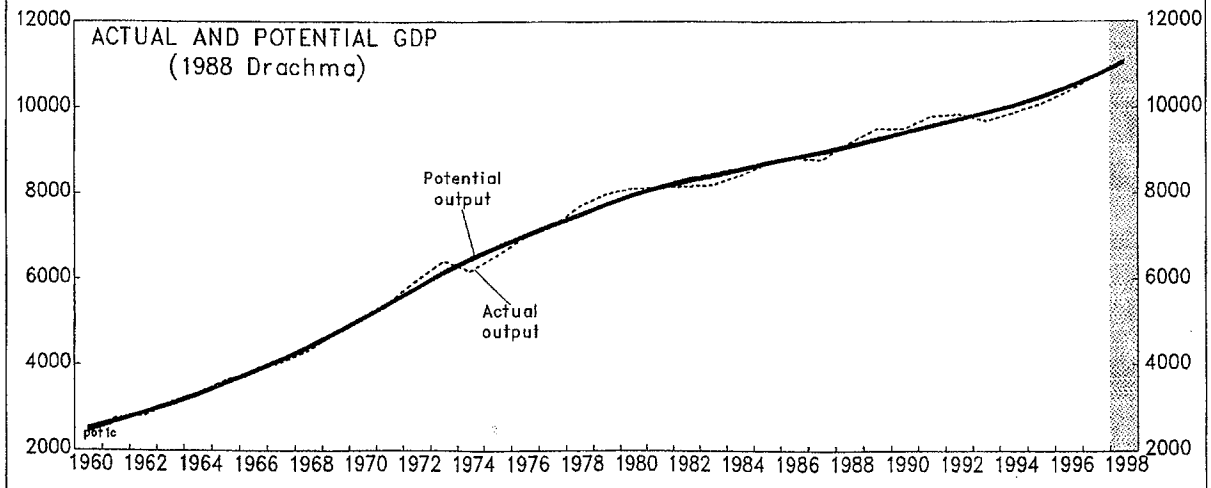
[8]The potential growth rate estimated by the production function and univariate approaches are found to be quite similar. This is because, as discussed more fully in the next section, the bulk of the reduction in potential output growth is due to slower growth in *tfp*, which is simply smoothed by a HP filter in constructing potential output.

[9]There are very few national studies of the output gap for Greece. Tsaliki (1991) examined the determinants of potential output during 1950–85, but did not address the output gap. Hall and Zonzilos' (1997) results covered 1953–95. They used a split-sample technique, with a 1.7 percent growth rate in the final period, 1982–95. This growth rate would imply that the economy was operating more than 3 percentage points above potential in 1997, although it is plausible that their technique would find a new regime for the later years.

Figure 1. Greece: Actual and Potential Output, and the Output Gap 1/







Sources: OECD Analytical Database; MNE; and staff calculations.

1/ Shaded areas show staff projections.

11. Estimates of the output gap provide a basis against which to assess the extent of inflationary pressures. This is particularly relevant in Greece's current context, given the objective of reducing inflation to within the Maastricht reference value by early 2000, so as to qualify for EMU membership in 2001. In this regard, a number of researchers (including Hall and Zonzilos, 1997; Karadeloglou, Papazoglou, and Zombanakis, 1998) and staff work reported in Chapter II of this paper, have found a significant positive relationship between inflation and the output gap in Greece.

12. What has accounted for the sharp decline in the rate of potential output growth in Greece? The dominant factor, accounting for 4 percentage points of the 5¼ percentage point drop in the potential growth rate between 1960–73 and 1982–97, was a decline in the rate of growth of total factor productivity (Table 2; and Figure 2), which is examined in the next section.[10] As regards the reduced contribution to growth from productive factors (accounting for the remaining 1 percentage point), this in turn was the result of an increase in labor's weighted contribution (from negative initial values) that was more than offset by a reduction in the weighted contribution of capital. Labor's negative contribution during 1960–73 reflects declining labor force participation rates due to the movement away from agriculture (where women are all assumed to participate in the labor force) and increasing incomes and broadened social insurance programs that allowed for earlier retirement ages and longer education periods prior to entering the labor force (Figure 3). While the male participation rate continued its secular decline in later years, female participation rates rebounded, especially after 1980, in part reflecting changing public attitudes.[11]

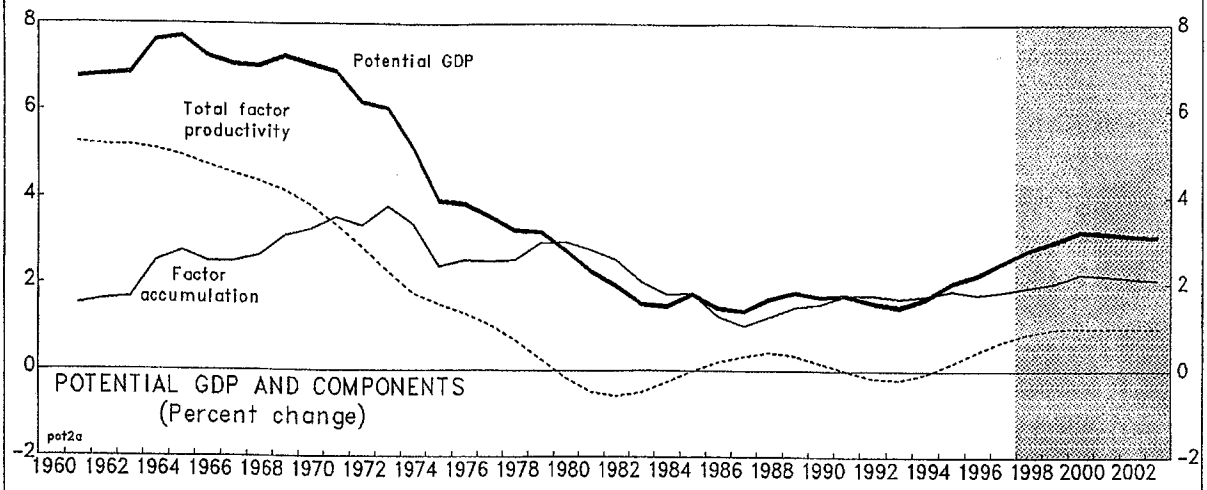
13. With regard to the contribution of capital, the decline in the pace of investment in Greece after the mid-1970s (Figure 4) is well documented. Tsaliki (1991) argued that the drop off in investment was the result of negative accelerator effects from slower growth rates for overall activity, a rising relative price of investment goods compared to total output, and a sharp decline in the rate of return to investment after 1973. Alogoskoufis (1995) found a similar pattern in the shadow price of capital, as proxied by the stock market index deflated by the investment goods deflator. As discussed more fully in the next section, this was seen to reflect increasing distortions due to changes in labor market behavior, rising unit labor costs, a shift in the tax regime against capital, concerns about the general protection of property rights, and a host of other rigidities. It was not until after financial sector liberalization, initial reforms of the labor market (notably in the wage indexation and bargaining system), and other

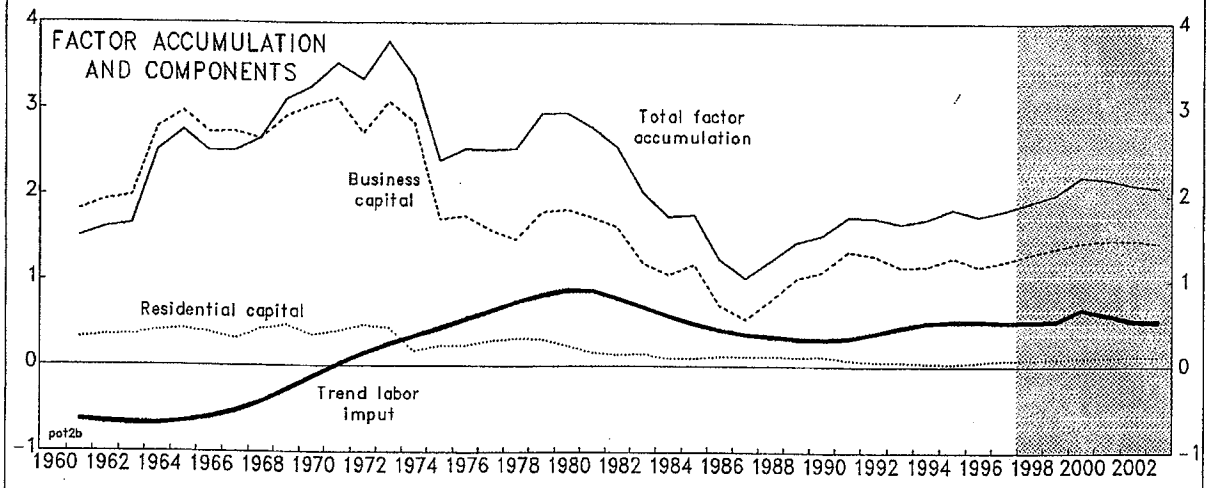
---

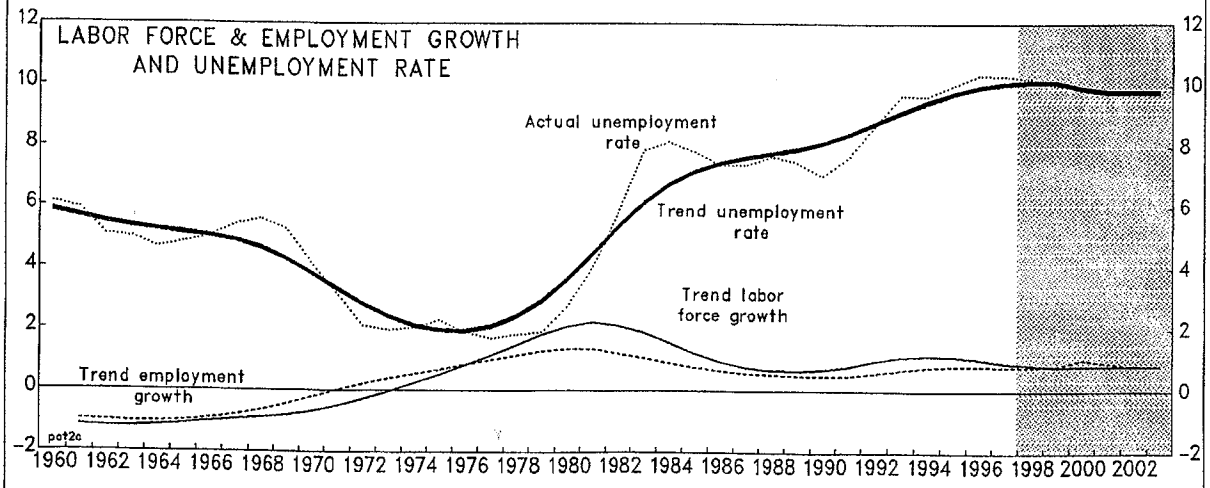
[10]The dates chosen to break the sample period into subsamples follow those in Zonzilos and Hall (1997).

[11]Labor's contribution to potential growth is also sensitive to the trend unemployment rate. The latter was estimated at 10.1 percent of the trend labor force in 1997, close to the actual unemployment rate of 10.3 percent. The estimated trend rate was also close to the 9.8 percent rate of "structural", or the nonaccelerating wage rate of, unemployment estimated by the OECD (1998).

Figure 2. Greece: Potential Output and Component Growth 1/



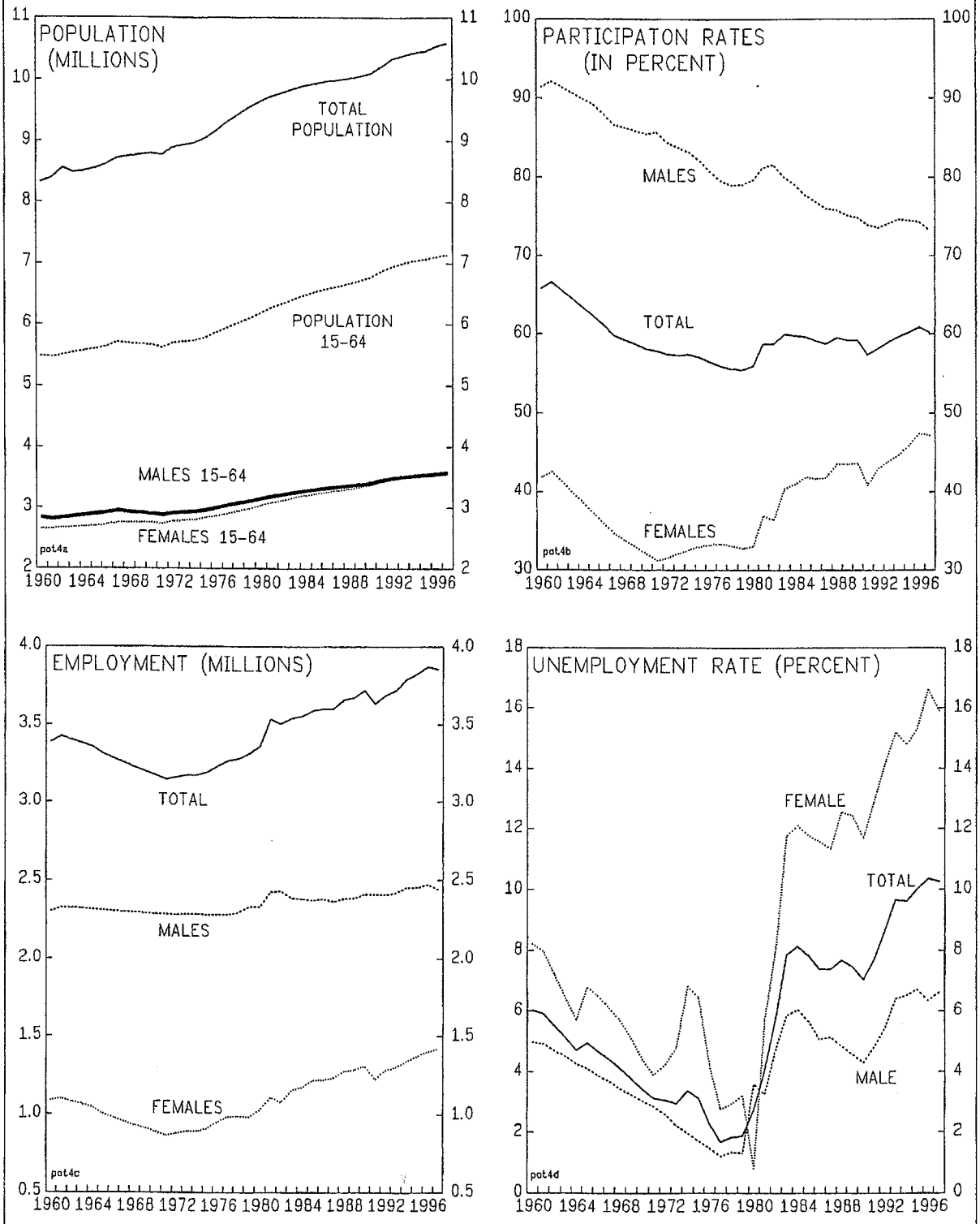




Sources: Data from OECD Analytical Database and MNE and staff projections and calculations.

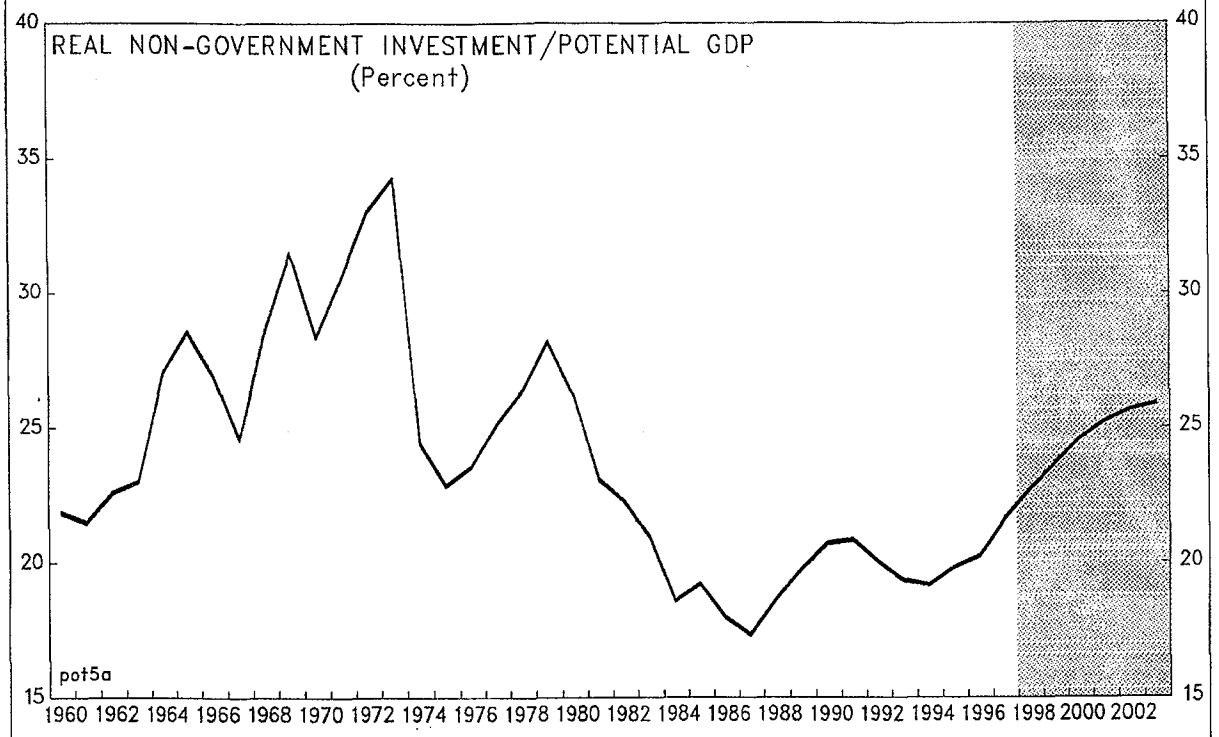
1/ Shaded areas show staff projections.

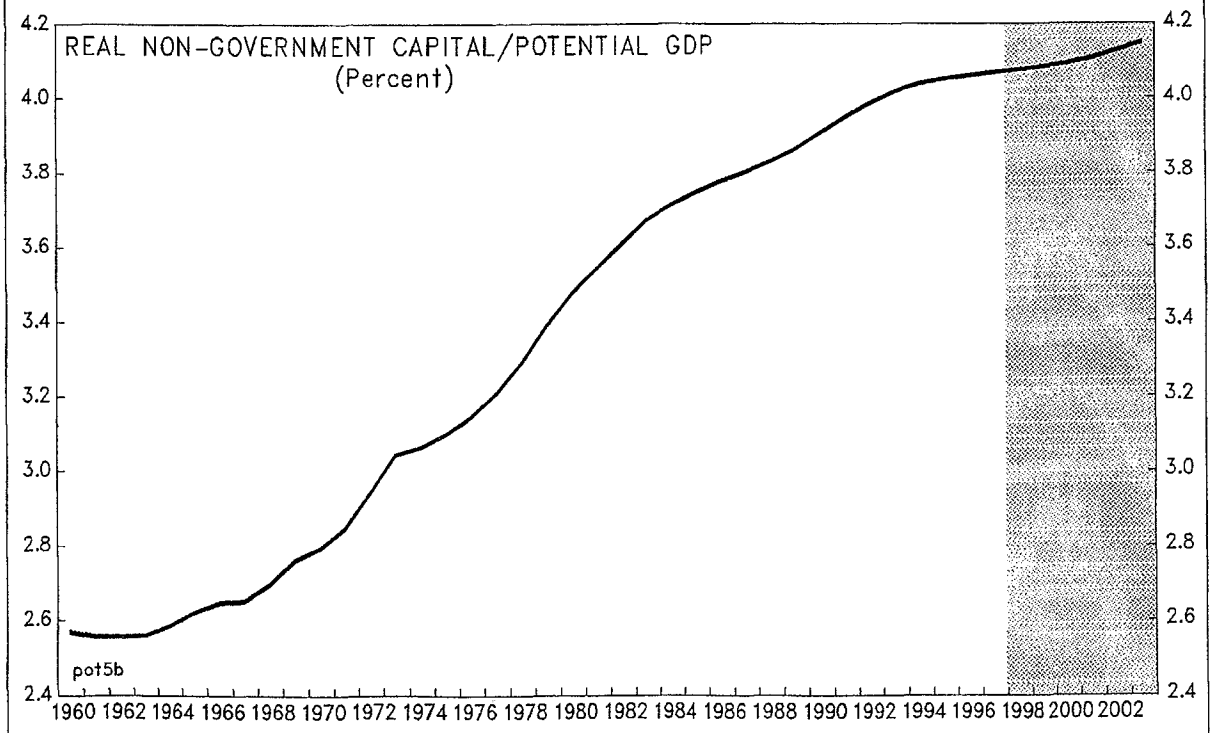
Figure 3. Greece: Labor Force Developments



Source: OECD; Tsaliki (1991); and MNE.

Figure 4. Greece: Non-Government Investment and Capital Ratios 1/





Sources: Data from OECD Analytical Database and MNE and staff projections and calculations.

1/ Shaded areas show staff projections.

supporting structural reforms were introduced in the late 1980s–early 1990s, and with a more continuous pursuit of stability-oriented macroeconomic policies, that private sector investment began to revive.

14. One may question how sensitive the results are to variations in the initial capital stock, as these data were generated based upon the initial (1960) levels of investment. A reduction in the nongovernment investment/potential GDP ratio by one standard deviation (equivalent to 6.8 percentage points of potential GDP) reduces the initial government capital stock/potential GDP ratio by 31.4 percentage points of potential GDP. However, given the subsequent historical levels of investment, it initially *increases* the growth rate in nongovernment capital in subsequent years, thereby increasing its weighted contribution to growth (Table 3). These effects diminish as the difference in initial capital stocks are subject to depreciation.[12] While the contribution of *tfp* to potential growth was correspondingly slightly reduced in 1960–73, its subsequent collapse continued to account for the bulk of the change in potential growth.

D. The Role of Total Factor Productivity

15. Productivity was almost stagnant over 1982–97, growing by far less than that in a sample of other economies for which recent comparable studies are available (Table 2). Identifying concrete reasons for the sharp drop in *tfp* growth is not straightforward. By construction, the term is a residual, in some sense a measure of our difficulty in explaining the growth process. Before examining factors that may have directly influenced the growth of *tfp,* it could mechanically be indirectly affected through a more careful estimation of the contributions made by labor and capital. This could include, for example, taking into account the effects of variations in education and hours worked on labor's effective contribution, and in capacity utilization for capital's contribution. Generally speaking, improvements in education levels tend to increase the effective labor input and to reduce the size and influence of *tfp*. This effect appears, however, to have been relatively small in Greece, and a further analysis was therefore not undertaken in this study.[13]

---

[12]The difference in the capital stocks was only 10 percent by 1971.

[13]In Greece the percentage of workers with no more than six years of education decreased from 42 percent of the workforce in 1961 to 27¾ percent in 1973 and to only 7½ percent in 1991 (the latest data available), while those with at least a secondary school education increased from almost 11 percent in 1961 to 19½ percent in 1973, and to 46½ percent in 1991. Were this by itself taken into account, labor's effective contribution to growth would be adjusted upward, with a corresponding lower contribution from total factor productivity. Tsaliki (1991) attempted to correct for this and other effects (such as age, gender and hours worked) in her estimates of potential growth over 1950–85, but found, however, that the improvement in education levels was largely offset by reductions in the return to education (which proxied for changes in relative productivity, though this most likely also reflected the

(continued...)

Factors affecting tfp growth

16. The fact that *tfp* is determined residually is not to say that we have do not have any ideas about factors aside from labor and capital that may influence the growth process, simply that they may be hard to quantify.[14] In this section we explore three potential factors, namely government capital, inflation, and the extent of state intervention in the economy.

17. A great deal of research has been undertaken to ascertain the role that **public investment** plays in facilitating economic growth. Aschauer (1989a) found a strong, positive relationship between public capital and productivity for the United States, and, in Aschauer (1989b), he extended these results to all of the G-7 economies. Baxter and King (1993) calibrated a small theoretical model to U.S. data and found a strong link between public investment and growth. In a cross-section data set for over 200 economies in the 1970s and 1980s, Easterly and Rebelo (1993) found that public transport and communications investments were significantly positively correlated with growth in per capita income. Nevertheless, the debate concerning the role of public infrastructure in productivity is far from settled. In a survey of this debate, Gramlich (1994) cites econometric difficulties regarding nonstationarity of the underlying series, possible simultaneity biases, and the economic implausibility of the large size of the estimated coefficients for public infrastructure.

18. The pattern of government capital accumulation in Greece reflects in some respects the pattern of *tfp* growth. In comparison to the variation in the private sector investment/potential GDP ratio, government investment patterns, when scaled for their mean values, were even more volatile (Figure 5).[15] In contrast to a steady increase in the nongovernment capital/output ratio in Greece, the government investment ratio, combined with the high rate of growth in output, was insufficient to maintain the governmental

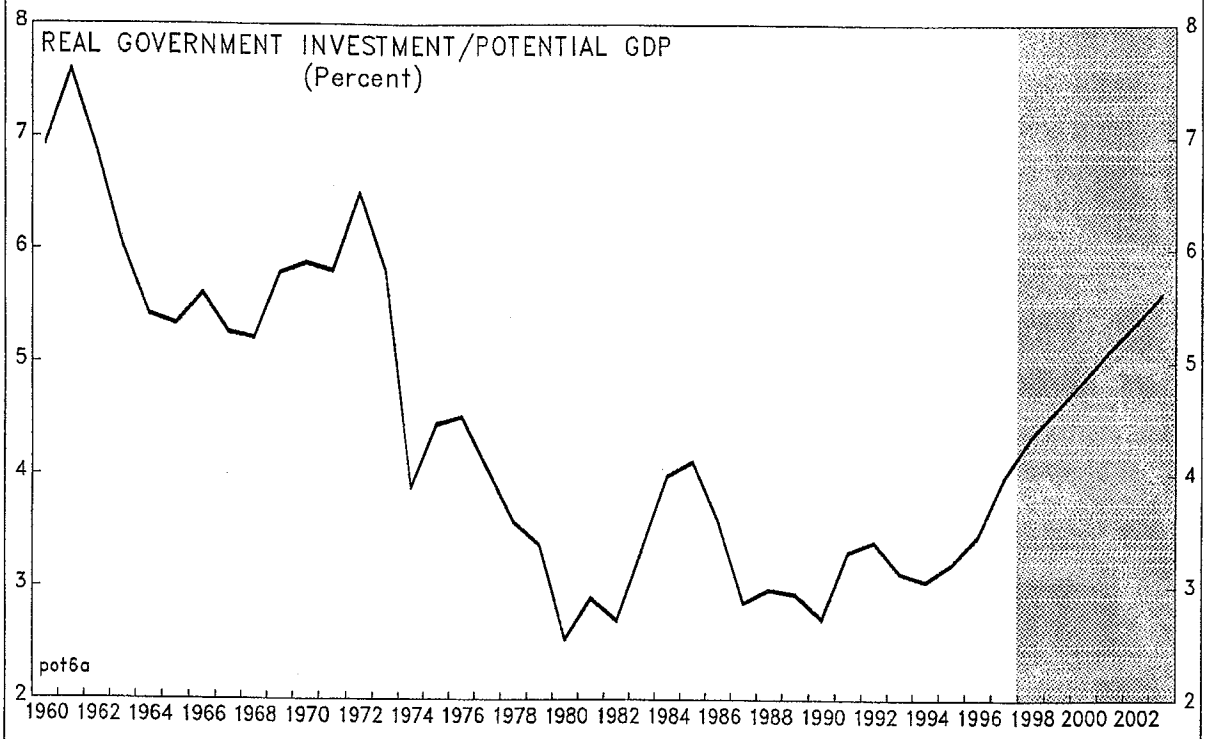
---

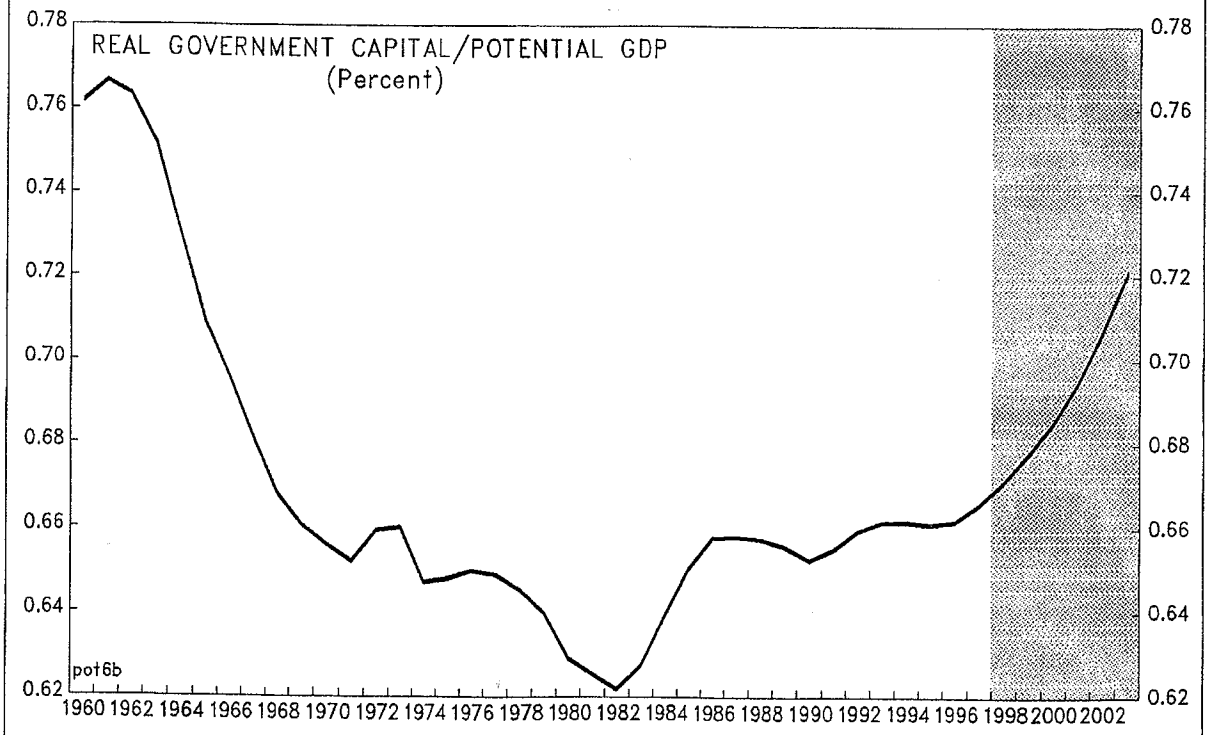
[13](...continued)
indexation system in place in the 1980s that led to a sharp compression of wages). Thus, while these refinements changed slightly the relative contributions of labor, capital and *tfp*, Tsaliki found that, as in this study, the growth of *tfp* after 1973 was much lower (by almost 4 percentage points) than it was in the earlier period, and accounted for the bulk of the decline in the growth rate of potential output.

[14]See, for example, the suggestions considered in the symposium on the slowdown in productivity growth contained in the fall 1998 issue of *The Journal of Economic Perspectives.* See Christofides (1996) for a review of these issues in the Greek context.

[15]The coefficient of variation for the private sector investment/potential GDP ratio was 0.17, while the corresponding figure for the government investment ratio was 0.30.

Figure 5. Greece: Government Investment and Capital Ratios 1/





Sources: Data from OECD Analytical Database and MNE and staff projections and calculations.

1/ Shaded areas show staff projections.

capital/output ratio.[16] Budgetary pressures led to a reduction in the investment ratio in the latter half of the 1970s, and resulted in a further decline in the capital/output ratio. Only with the upturn in investment in the mid-1980s, combined with a collapse in the growth of activity, did the capital/output ratio rebound. However, Alogoskoufis (1995) has argued that these investments focused more on improving social infrastructure (e.g., old-age housing, local hospitals, town squares and pavement projects), and thus were less effective in promoting measured output.

19. Beginning in the latter half of the 1980s, the then EC's structural funds programs took on increasing importance in the context of the European Single Act, with the intention of channeling substantial unilateral transfers to relatively underdeveloped regions of the Community to facilitate convergence in living standards.[17] While the initial rate of absorption of potential funds by Greece was poor, it has increased in recent years, with improved project selection, monitoring, and implementation by both the Greek authorities and the EU. A major part of these funds are used for large-scale infrastructure projects, and it is anticipated that public investment will remain sustained in the coming years.[18]

20. A second factor that has been cited as influencing growth is high and variable **inflation** (see among others Sarel, 1995; and Ghosh and Phillips, 1998). The channels through which this occurs are potentially numerous (e.g., lower investment resulting from uncertainty due to the positive correlation between high and variable inflation, and the impact of incomplete indexing on real effective tax rates). High inflation may also render uneconomic investments that were prospectively profitable (e.g., from a loss of competitiveness in export sectors given an exchange rate peg). Inflation in Greece has certainly been quite variable, and until recently quite high (Figure 6). It averaged only 2 percent in the 1960s, but jumped to 14 percent in the 1970s and to 19 percent in the 1980s, the period of low *tfp* growth. It was still above

---

[16]The change in the capital output ratio is approximately determined by the investment/GDP ratio *minus* the product of the capital/output ratio, lagged one period, and the sum of the rate of depreciation and the growth rate of the economy. Thus, a higher rate of output growth would, ceteris paribus, reduce the capital/output ratio. However, note that, by comparison, the variation in the government capital/output ratio was quite minor when compared to the nongovernmental ratio.

[17]See Gaspar and Pereira (1995) for an analysis of the effect of EU transfers on real convergence of living standards in Portugal.

[18]Although at a pace that is likely to be less ambitious than that assumed in the updated convergence program.

15 percent as late as 1992, before falling back to 5½ percent in 1997, a period in which *tfp* growth has picked up.[19]

21. A third possible factor that may have affected the growth of *tfp* is the **degree of direct government involvement** in economic decision-making. This, of course, is an area where examples of both beneficial and adverse economic influences abound. Following the end of the military regime in Greece in 1974, the democratically elected government was faced with both a political need to undertake social modernization (including labor legislation, social insurance, education reform, and the provision of health care) that had been previously suppressed, and with the economic need to address macroeconomic imbalances.[20] General government current primary expenditure rose from an average of 18¼ percent of GDP during 1960–73 to 24¾ percent of GDP during 1974–81, with a further increase to slightly over 31 percent of GDP during 1982–97. Government employment displayed a similar increase, doubling its share in total employment, to 10 percent, between 1960 and 1990 (Figure 6).[21] In addition to an activist fiscal policy, direct involvement in economic decisions also increased as successive governments provided support to or nationalized "problem" enterprises, and credit from state-owned banks was channeled to targeted industries or firms. Direct price and interest rate controls, as well as extensive labor market regulations, including distortionary wage indexation policies throughout the 1980s, led to an ossified economic structure and a serious misallocation of resources.[22]

22. Steps began to be taken in the late 1980s to deregulate segments of the Greek economy, and to reduce the pervasive role of the state in economic decision-making. Financial sector and product market reforms were gradually introduced. As importantly, there was

---

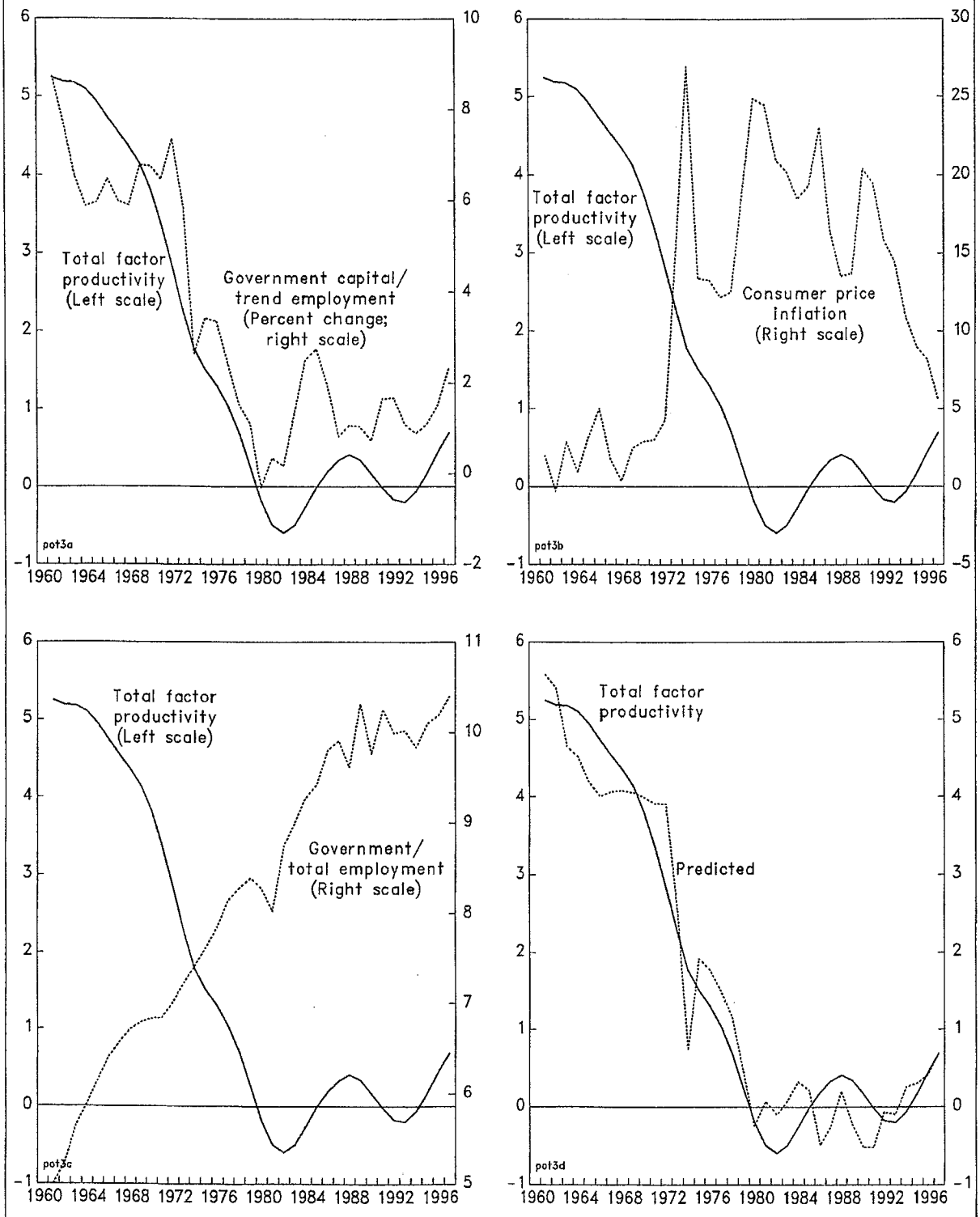
[19]There remains some dispute about the costs and benefits of low and stable inflation, and of the advantages of further reducing inflation from already low levels. Thus, it would appear that the benefits to the economy from reducing inflation further are not as large as those obtained from bringing inflation down from the high levels experienced in Greece in the 1980s.

[20]For a discussion of postwar Greek economic history, see Alogoskoufis (1995), Curtis, ed. (1994), and Jouganatos (1992).

[21]Demekas and Kontolemis (1996) found that the rising share of public sector employment and the government's wage decisions during the 1980s contributed significantly to real wage rigidities and rising unemployment.

[22]Koedijk and Kremers (1996) found a clear negative relationship between regulation and economic performance, and characterized Greece as having the most extensive degree of regulation of labor and product markets in the late 1980s–early 1990s among EU economies. Ireland, in contrast, was characterized as having the least regulated labor and product markets, and has been growing this decade at a remarkably brisk pace.

Figure 6. Greece: Total Factor Productivity and Potential Influences



Sources: OECD Analytical Database; MNE; and staff calculations.

substantial progress toward macroeconomic stability, with sizable reductions in inflation and in the fiscal deficit (although the reliance on increased revenues to achieve the fiscal improvement may have contributed to distortions elsewhere, notably in the labor market).

23. Bringing together the above considerations, an attempt was made to assess the role that government investment, inflation and the degree of government involvement in the economy may have had on *tfp* growth in Greece. A time series similar to Koedijk and Kremers' point estimate was not readily available to measure government involvement, so the ratio of government to total employment was used as a crude proxy.[23] Attempts were made to find a co-integrating relationship among the rate of growth of *tfp*, the growth rate of government capital/trend employment, consumer price inflation and the share of government employment over 1961–97 (as all of the series are integrated of order 1):

$$\begin{array}{lccccc} \text{pch}(tfp) = & 6.71 + 0.22\text{pch}(Kg/L^*) & - 0.08infl & - 0.59(Lg/L) & & (4) \\ & (5.56) \quad (2.61) & & (4.53) \quad (5.52) & & \end{array}$$

$R^2 = 0.94$ CRDW = 0.88 ADF(1) = -3.30 ADF(4) = -2.42

where *Kg* and *Lg* are government capital and labor, respectively (t-statistics are in parentheses).

24. The results are rather fragile and should be viewed as merely suggestive of some of the influences on the growth of *tfp*, but are not implausible (see bottom right panel of Figure 6).[24] The coefficient on the percent change in per-worker government capital is not unusually large, as has often been found in other studies (e.g., on the United States, see Gramlich, 1994). The coefficient on inflation has the correct sign and is significant, but is much larger (by a factor of about 10) than those found in Ghosh and Phillips (1998). Finally, the effect of government employment is also found to be significantly negative, and itself is estimated to account for about one-half of the decline in the growth of *tfp*. Again, while being wary of putting too

---

[23]One could also use government consumption to GDP, a ratio often used in growth convergence equations; see Barro and Sala-i-Martin (1995). The results were found not to be sensitive to the choice of either variable.

[24]One sign of the fragility of the results was that the coefficient on the growth in the government capital stock was found to be significant only at the 10 percent level, and only if lagged one period, while the growth in the government capital stock *per trend employee* was significant at traditional test levels. This lack of robustness to various specifications was also found in a recent study by Vijverberg, Vijverberg, and Gamble (1997).

much weight on these estimates, it is worth noting that the equation tracks the recent upturn in *tfp* growth quite well.[25]

25. The above equation has a number of additional shortcomings. First, the tests for nonstationarity of the residuals cannot be rejected at traditional levels of significance, although the co-integration regression Durbin-Watson statistic and the augmented Dickey-Fuller regression with one lag are both significant at the 10 percent level. Second, and more importantly, it is possible that any given set of variables may contain more than one long-run relationship: there may be more than one co-integrating vector. Therefore, the procedure developed by Johansen and Juselius (1990) was followed to test for the number of co-integrating vectors (see appendix for details). This method, while confirming the significant influence of growth in government investment per trend employee and of the share of government employment on the growth in *tfp*, did not find a significant role for inflation. The equation should thus be viewed as merely suggestive of some of the factors that may have influenced the growth record in Greece.

Prospects for tfp and potential output

26. What are the prospects for the growth of potential output in Greece? The following table compares the staff's projection for growth of potential output and of its components with those implied by forecasts contained in the authorities' updated convergence program.

	Potential Output	Total Factor Productivity	Factor Inputs	Weighted Capital	Weighted Labor
			(Percent changes)		
Observed					
1960–97	3.9	1.7	2.3	2.0	0.2
1960–73	7.0	4.3	2.7	3.0	-0.4
1974–81	3.5	0.7	2.8	2.1	0.7
1982–97	1.7	0.1	1.7	1.2	0.5
Projected 1998–2001					
Convergence program	3.7	1.2	2.3	1.7	0.6
Staff	3.0	1.0	2.0	1.5	0.5

[25]There is again some question as to the sensitivity of the results to the initial level of the capital stock. A reduction in the investment/potential GDP ratio by one standard deviation (equivalent to 1.3 percentage points) reduced the initial government capital stock/potential GDP ratio by almost 15 percentage points of potential GDP. However, given the subsequent historical levels of investment, it *increased* the percentage change in the government capital/trend employment by about 2.5 percentage points in 1961, with a smooth convergence in the revised and initial growth rates thereafter. A regression using the lower bound capital stock data resulted in little change in the coefficient estimates or in the overall fit of the equation.

27. Turning first to the factors of production, demographic projections entail little change in the growth rate of the population, or of the share of those of working age within the population, in the coming decade (although the latter is expected to fall relatively rapidly thereafter). It is also likely that labor force participation rates will continue to show a medium-term trend increase (despite the reduction that occurred in 1997, which is thought to have reflected sampling problems in the labor force survey), especially as the female participation rate remains far below its EU average. The outlook for unemployment is more problematic. Despite sustained growth in recent years, the unemployment rate has remained above 10 percent of the labor force. Thus, barring significant labor market reforms, it is unclear whether the unemployment rate should be expected to decline.[26] Investment prospects, in contrast, are expected to remain buoyant. Aside from the effects of the devaluation of March 1998, a return to disinflation and nominal convergence in Greece is anticipated to lower the cost of capital and improve cash flows. The stock market has risen by some 70 percent since the devaluation, also a sign of improved prospects, and funds raised through the market, while still small compared to other forms of financing, are at all-time highs. It does not appear implausible that the total weighted factor contributions to potential output could be about 2 percent per year, slightly higher than they have been so far this decade.

28. Prospects for the growth of *tfp* are inevitably more uncertain. At the time of joining the ERM in March 1998, and as articulated further in the updated convergence program, the Greek authorities announced a concerted plan covering privatization, the restructuring of loss-making state-owned enterprises, and labor market and social security reforms. Structural action in these areas will be central to boosting productivity and sustaining a noninflationary growth of employment and investment, as postulated in the convergence program. The privatization program and restructuring of major loss-making enterprises should have both direct as well as demonstration effects on productivity. Extensive guarantees of job security would however be at odds with achieving the required productivity gains. Furthermore, current plans still leave a large state presence in a number of commercial spheres, either because there are no intentions for privatization at this time (including some large commercial banks and traditional utilities), or because the sell-offs are partial, limited to up to 49 percent of each firm. Greater efforts at deregulation and liberalization in sectors that are not presently slated for privatization could help enhance competition and reduce the costs of some basic inputs to the rest of the economy.

29. Regarding social security, the government is adopting a two-stage approach. A first phase consisting of a package of measures that can be quickly implemented is currently under way (it includes registration and required contributions by heretofore illegal immigrant workers, other measures to curtail contribution evasion, merging of various supplementary pension schemes, restricting pensioners' right to employment to curtail early retirement, and

---

[26]In fact, the OECD (1998) projects the unemployment rate to increase further to over 10½ percent this year, and to remain as high in 1999, while the staff foresees a modest decline to 10 percent by next year, close to prevailing estimates of the natural rate.

partly liberalizing the choice of investments available for surplus funds). The second, and more ambitious, phase, for which a timetable is to be announced by end-1998, would harmonize key parameters (e.g., minimum retirement ages, contribution periods, and replacement ratios) across all pension schemes, with a view to ensuring the system's longer-term viability and equity, as well as introduce complementary fully funded schemes. These reforms should, when adopted, improve labor market mobility (with increasing pension portability), and raise labor's contribution to growth by limiting early retirement and reducing the tax wedge from social security contributions by making part of the system fully funded.

30. The need for comprehensive reforms to improve the functioning of the labor market in Greece is widely recognized.[27] Greece has relatively low participation and employment rates, and high youth and long-term unemployment. Strict rules on working time impede the efficient use of labor, while high severance costs and restrictions on collective dismissals deter firms from new hiring. Minimum wages are not differentiated by age or sector, and the overall wage structure is highly compressed (as evidenced by one of the highest ratios of minimum to average production wages in the OECD). The authorities intend to address some of these issues through legislation, to be adopted this year, that would improve work time flexibility, liberalize certain work rules, and allow part-time work in the public sector. Local employment agreements, that would suspend sectoral wage awards in high unemployment areas, are also to be introduced, as are provisions allowing for private (but nonprofit) employment agencies.[28] Further labor market reforms (to, for example, allow for differentiated minimum wages, reduce firing restrictions and high severance costs, and allow for-profit employment services) would increase the likelihood of improving the growth of potential output.

E. Summary and Conclusions

31. The paper began by asking whether the postwar Greek economy is entering a third phase, characterized by renewed growth that would allow for a sustained convergence in living standards with its EU partners. It was seen that the disappointing growth performance in the decades following the mid-1970s was largely due to a collapse in the growth of total factor productivity, rather than to a reduction in the rate of factor accumulation. While it is comparatively difficult to pin down the reasons for changes in the growth of *tfp*, it was suggested that variations in the growth of public investment, and in the extent of the

---

[27]Coe and Snower (1996) make the case for fundamental labor market reform in Europe, stressing the role of complementarities in which changes in policies will have a greater effect on unemployment when adopted jointly, rather than in isolation. As regards Greece, the shortcomings of the functioning of the labor market were highlighted in Demekas and Kontolemis (1996) and in the 1996 OECD Economic Survey for Greece (Chapter 3).

[28]The authorities' intentions in other areas relating to the labor market, including education and training, small businesses formation, and taxation are set out in their recent National Action Plan for Employment (1998).

government's direct involvement in economic decision-making, may have played a role, while the effect of inflation on potential growth appears less certain.

32. Recent developments in these key areas portend positively for growth prospects. The pursuit of macroeconomic stability is at the center of the government's economic policy. The rate of public investment is rising, with increased emphasis on basic infrastructure, supported by an improved absorption of EU funds. In addition, the government has announced a set of structural reforms that should, when fully implemented, allow for increased productivity and flexibility, with scope for additional efforts in this area having the potential to improve prospects further. In all, the projections contained in the new convergence program imply a sharp acceleration in the growth of *tfp* and of potential output—to rates last seen in the early 1970s. Such a pickup cannot be ruled out, but its realization clearly hinges on carrying forward with a broadly conceived and boldly implemented program of structural reforms.

Table 1. Greece: Actual and Potential Growth, and the Output Gap

	1995	1996	1997	Projections 1998	1999
	(Percent change)				
IMF					
Output gap 1/	-1.5	-1.0	-0.1	0.2	0.8
Actual/ projected growth	2.1	2.7	3.5	3.2	3.6
Potential growth	2.0	2.2	2.6	2.8	3.0
OECD					
Output gap 1/	-3.6	-2.9	-1.6	-1.2	-0.5
Actual/ projected growth	2.1	2.7	3.5	3.0	3.4
Implied potential growth		2.0	2.2	2.6	2.7
EU					
Output gap 1/	-2.5	-2.3	-1.3	-0.3	0.8
Actual/ projected growth	1.8	2.6	3.5	3.8	4.0
Implied potential growth		2.4	2.5	2.8	3.0

Sources: OECD Economic Outlook, June, 1998; EU Commission, Spring 1998 forecasts; and Fund staff calculations.

1/ Percent of potential output.

Table 2. Sources of Growth, International Comparisons

	Potential Output	Total Factor Productivity	Factor Inputs	Weighted contributions	
				Capital	Labor
Greece					
1960–97	*3.9*	*1.7*	*2.3*	*2.0*	*0.2*
1960–73	7.0	4.3	2.7	3.0	-0.4
1974–81	3.5	0.7	2.8	2.1	0.7
1982–97	1.7	0.1	1.7	1.2	0.5
1998–2003	**3.1**	**1.0**	**2.1**	**1.5**	**0.6**
Austria 1/					
1971–80	3.6	1.7	1.9	2.1	-0.2
1981–90	2.3	1.1	1.1	1.2	-0.1
1991–97	2.6	1.0	1.6	1.3	0.3
Iceland 2/					
1990–96	1.3	0.9	0.4	0.6	-0.2
Switzerland					
1991–95	1.0	0.3	0.7	0.6	0.1
United Kingdom					
1990–96	1.7	0.9	0.9	0.8	0.1
United States					
1990–95	2.1	0.6	1.5	...	...
Chile					
1971–95	3.7	0.8	2.9	1.6	1.3
1991–95	7.5	3.3	4.2	2.8	1.4
Korea					
1966–70	14.4	1.3	13.1	6.0	7.1
1970–80	9.4	1.1	8.4	4.8	3.6
1980–90	9.6	2.5	7.2	2.8	4.4
Taiwan Province of China					
1966–70	11.1	3.4	7.8	4.5	3.3
1970–80	10.3	1.5	8.8	3.8	5.0
1980–90	7.8	3.3	4.5	2.1	2.4

Sources: Austria, forthcoming IMF Country Report; Iceland, IMF Country Report No. 97/15; Switzerland, IMF Country Report No. 97/18; United Kingdom, IMF Country Report No. 96/130; United States, IMF Country Report No. 96/93; Chile, WP/97/104; Korea and Taiwan Province of China, A. Young (1995); and Fund staff calculations.

1/ Business sector.

2/ Non-fish business sector.

Table 3. Greece: Sources of Growth

	Potential Output	Total Factor Productivity	Factor Inputs	Weighted contributions	
				Capital	Labor
Greece					
1961	6.7	5.2	1.5	2.1	-0.6
1962	6.8	5.2	1.6	2.3	-0.7
1963	6.8	5.2	1.7	2.3	-0.7
1964	7.6	5.1	2.5	3.2	-0.7
1965	7.7	4.9	2.7	3.4	-0.7
1966	7.2	4.7	2.5	3.1	-0.6
1967	7.1	4.5	2.5	3.0	-0.5
1968	7.0	4.4	2.7	3.1	-0.4
1969	7.2	4.1	3.1	3.4	-0.3
1970	7.1	3.8	3.3	3.4	-0.1
1971	6.9	3.4	3.5	3.5	0.0
1972	6.2	2.8	3.3	3.2	0.1
1973	6.0	2.3	3.8	3.5	0.3
1974	5.1	1.8	3.4	3.0	0.3
1975	3.9	1.5	2.4	2.0	0.4
1976	3.8	1.3	2.5	2.0	0.5
1977	3.6	1.0	2.5	1.9	0.6
1978	3.2	0.7	2.5	1.8	0.7
1979	3.2	0.3	2.9	2.1	0.8
1980	2.8	-0.2	2.9	2.1	0.9
1981	2.3	-0.5	2.8	1.9	0.9
1982	2.0	-0.6	2.6	1.8	0.8
1983	1.5	-0.5	2.0	1.3	0.7
1984	1.5	-0.3	1.7	1.2	0.6
1985	1.8	0.0	1.8	1.3	0.5
1986	1.4	0.2	1.2	0.8	0.4
1987	1.4	0.3	1.0	0.7	0.4
1988	1.6	0.4	1.2	0.9	0.3
1989	1.8	0.3	1.5	1.1	0.3
1990	1.7	0.2	1.5	1.2	0.3
1991	1.7	0.0	1.7	1.4	0.3
1992	1.6	-0.2	1.7	1.4	0.4
1993	1.5	-0.2	1.7	1.2	0.5
1994	1.7	-0.1	1.7	1.2	0.5
1995	2.0	0.2	1.8	1.3	0.5
1996	2.2	0.4	1.8	1.2	0.5
1997	2.5	0.7	1.8	1.3	0.5
1998	2.8	0.9	1.9	1.4	0.5
1999	3.0	1.0	2.0	1.5	0.5
2000	3.2	1.0	2.2	1.6	0.7
2001	3.2	1.0	2.2	1.6	0.6
2002	3.1	1.0	2.1	1.6	0.5
2003	3.1	1.0	2.1	1.6	0.5
1961–70	7.1	4.7	2.4	2.9	-0.5
1971–80	4.5	1.5	3.0	2.5	0.5
1981–90	1.7	0.0	1.7	1.2	0.5
1991–97	1.9	0.1	1.8	1.3	0.5
1998–2003	3.1	1.0	2.1	1.5	0.6

Sources: Data from OECD Analytical Database and MNE; and Fund staff projections and calculations.

Results of the Johansen-Juselius Procedure for *tfp* Growth in Greece

33. In light of the possible econometric shortcomings discussed in Chapter I, the Johansen-Juselius procedure was followed to test for the number of co-integrating vectors. The following table reports the test statistics and the estimated co-integrating vector from the procedure, where r is the number of co-integrating vectors.

Johansen Maximum Likelihood Tests and Parameter Estimates
(1964–1997, maximum of 3 lags in VAR)
eigenvalues in descending order: 0.57, 0.36, 0.21, 0.07

A. Co-integration likelihood ratio test based on maximal eigenvalue of the stochastic matrix

Hypothesis[1/]		Test	95 percent	90 percent
Null	Alternative	statistic	critical value	critical value
r = 0	r = 1	29.03*	27.10	21.58
r ≤ 1	r = 2	14.92	21.00	15.59
r ≤ 2	r = 3	8.11	14.10	9.52
r ≤ 3	r = 4	2.59	3.84	2.86

B. Co-integration likelihood ratio test based on trace of the stochastic matrix

Hypothesis[1/]		Test	95 percent	90 percent
Null	Alternative	statistic	critical value	critical value
r = 0	r = 1	54.66**	47.20	36.58
r ≤ 1	r = 2	25.63	29.70	21.63
r ≤ 2	r = 3	10.17	15.40	10.47
r ≤ 3	r = 4	2.59	3.84	2.86

C. Estimated co-integrating vectors (coefficients normalized on pch(*tfp*))

Vector	pch(*tfp*)	pch(*Kg/L**)	*infl*	*Lg/L*
1	-1.000	0.626	0.011	-0.735

1/ The number of co-integrating vectors is denoted by r.

34. Panel A reports the maximal eigenvalue test of the null hypothesis that there are at most r co-integrating vectors against the alternative $r + 1$ vectors. Beginning with the null hypothesis that there are three or less co-integrating vectors ($r \leq 3$) against the alternative of four co-integrating vectors ($r = 4$), the test statistic (2.59) is less than the 95 percent critical value (3.80), not allowing one to reject the null hypothesis and indicating that there are at most three co-integrating vectors. Similarly, tests for $r \leq 2$ against the alternative $r = 3$, and for $r \leq 1$ against the alternative $r = 2$, cannot be rejected. However, the null hypothesis that there is no co-integrating vector against the alternative that there is one such vector can be rejected at the standard 95 percent significance level, suggesting that there is a unique co-integrating vector. Panel B reports the trace test of the null hypothesis that there are at most r co-integrating vectors against the alternative that there are $r + 1$ vectors. Again, one cannot

reject the null hypotheses that there are three or fewer, two or fewer, and one or fewer co-integrating vectors against their associated alternate hypotheses, but one can reject the hypothesis (at the 99 percent significance level) that there are is no co-integrating vector ($r = 0$), suggesting that there is at least one co-integrating vector.

35. Panel C of the above table presents the estimated co-integrating vector, with the coefficients normalized on the rate of growth of *tfp*. The coefficient estimates for the percent change in government capital per trend employee and for the share of government in total employment are appropriately signed, although their values are somewhat higher than those obtained in equation (4) of the main text. The coefficient on inflation, in contrast, is incorrectly signed, although a likelihood ratio test is unable to reject that the variable is not significant, in contrast to the significant *t*-statistic in equation (4). Thus, from the two approaches, it would appear that the growth in *tfp* is clearly co-integrated with growth in government capital per worker and with the size of the state in the total economy as measured by its share of employment, but the influence of inflation appears less clear-cut.

References

Alogoskoufis, George, 1995, "The Two Faces of Janus: Institutions, Policy Regimes and Macroeconomic Performance," *Economic Policy*, No. 20, pp. 147–192.

Artus, Jacques, 1997, "Measures of Potential Output in Manufacturing for Eight Industrial Countries, 1955–78," *Staff Papers,* International Monetary Fund, Vol. 24, pp. 1–35.

Aschauer, David, 1989, "Is Public Expenditure Productive?,"*Journal of Monetary Economics*, pp. 177–200.

———, 1989, "Back of the G-7 Pack: Public Investment and Productivity Growth in the Group of Seven," Federal Reserve Bank of Chicago Working Paper WP-89-13.

Barro, Robert, and Xavier Sala-i-Martin, 1995, *Economic Growth*, (New York: McGraw-Hill).

Baxter, Marianne, and Robert King, 1993, "Fiscal Policy in General Equilibrium," *American Economic Review*, No. 3, Vol. 83 (June), pp. 315–334.

Christofides, Charalambos, 1996, "Growth Performance: A Survey of the Literature," in *Greece—Recent Economic Developments and Selected Issues*, IMF Staff Country Report No. 96/121 (Washington: International Monetary Fund).

Coe, David, and Dennis Snower, 1996, "Policy Complementarities: The Case for Fundamental Labor Market Reform," IMF Working Paper 96/93 (Washington: International Monetary Fund).

Curtis, Glenn, 1995, *Greece: A Country Study*, 4th edition, Federal Research Division, Library of Congress, Washington.

Demekas, Dimitri, and Zenon Kontolemis, 1996, "Unemployment: A Survey of the Issues," in *Greece—Recent Economic Developments and Selected Issues*, IMF Staff Country Report No. 96/121 (Washington: International Monetary Fund).

De Masi, Paula, 1997, "IMF Estimates of Potential Output: Theory and Practice," IMF Working Paper 97/177 (Washington: International Monetary Fund).

Easterly, William, and Sergio Rebelo, 1993, "Fiscal Policy and Economic Growth: An Empirical Investigation," NBER Working Paper No. 4499.

Garganas, Nicholas, 1992, *The Bank of Greece Econometric Model of the Greek Economy*, Bank of Greece, Athens.

Gaspar, Vítor, and Alfredo Pereira, 1995, "The Impact of Financial Integration and Unilateral Public Transfers on Investment and Growth in EC Capital-Importing Countries," *Journal of Development Economics*, Vol. 48, pp. 43–66.

Ghosh, Atish, and Steven Phillips, 1998, "Inflation, Disinflation, and Growth," IMF Working Paper 98/68 (Washington: International Monetary Fund).

Giorno, Claude, Peter Richardson, Deborah Roseveare, and Paul van den Noord, 1995, "Estimating Potential Output, Output Gaps and Structural Budget Balance," Economics Department Working Paper No. 152 (Paris: OECD).

Government of Greece, 1998, *National Action Plan for Employment: Greece, 1998*, Ministry of Labor and Social Security, Athens.

Gramlich, Edward, 1994, "Infrastructure Investment: A Review Essay," *Journal of Economic Literature*, Vol. XXXII, No. 3.

Hall, S. G., and N. G. Zonsilos, 1997, "The Output Gap and Inflation in Greece," mimeo, Athens.

International Monetary Fund, 1996, "The Cyclical Position of the U.S. Economy and Its Relationship with Inflation," in *United States—Selected Issues*, IMF Staff Country Report No. 96/93 (Washington: International Monetary Fund).

Jaeger, Albert, 1997, "Estimates of Potential Output Growth and the Cyclical Output Gap," in *Switzerland—Selected Issues and Statistical Appendix*, IMF Staff Country Report No. 97/18 (Washington: International Monetary Fund).

Johanson, Søren, and Katarina Juselius, 1990, "Maximum Likelihood Estimation and Inference on Co-integration—With Applications to the Demand for Money," *Oxford Bulletin of Economics and Statistics*, Vol. 52, pp. 169–210.

Jouganatos, George, 1992, *The Development of the Greek Economy, 1950–91: An Historical, Empirical and Econometric Analysis* (Westport, Connecticut: Greenwood Press).

Karadeloglou, Pavlos, Christos Papazoglou, and George Zombanakis, 1998, "Is the Exchange Rate and Effective Anti-Inflationary Policy Instrument?," Bank of Greece Economic Research Department, Athens.

Koedijk, Kees, and Joroen Kremers, 1996, "Deregulation: A Political Economy Analysis," *Economic Policy*, pp. 443–467.

Kumar, Monmohan, 1996, "Potential Growth and the Output Gap," in *United Kingdom—Recent Economic Developments*, IMF Staff Country Report No. 96/130 (Washington: International Monetary Fund).

Magnier, Antoine, 1997, "Potential Output and the Output Gap," in *Iceland—Recent Economic Developments*, IMF Staff Country Report No. 97/15 (Washington: International Monetary Fund).

————, 1998, "Potential Output and the Output Gap in Austria: A European Perspective," in *Austria—Selected Issues and Statistical Appendix*, IMF Staff Country Report (to be published).

OECD, 1996, *OECD Economic Surveys: Greece 1996*, Paris.

————, 1998, "The OECD Jobs Strategy: Progress Report on Implementation of Country-Specific Recommendations (Note by the Secretariat)," Paris.

Roldos, Jorge, 1997, "Potential Output Growth in Emerging Market Countries: The Case of Chile," IMF Working Paper 97/104 (Washington: International Monetary Fund).

Sarel, Michael, 1995, "Non Linear Effects of Inflation and Economic Growth," IMF Working Paper 95/56 (Washington: Interntional Monetary Fund).

Tsaliki, Persefoni, 1991, The Greek Economy: Sources of Growth in the Postwar Era (New York: Praeger).

Vijverberg, Wim, Chu-Ping Vijverberg, and Janet Gamble, 1997, "Public Capital and Private Productivity," *The Review of Economics and Statistics*, Vol. LXXIX, Number 2, pp. 267–278.

Young, Alwyn, 1995, "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience," *Quarterly Journal of Economics*, Vol. 110 (3), pp. 641–80.

II. Post-devaluation Inflation Prospects: An Empirical Investigation[29]

A. Introduction

36. Reducing inflation to within the Maastricht reference value appears to constitute the most challenging hurdle to Greece's EMU aspirations. Despite the substantial progress to date, inflation is still well above the upper limit established in the Maastricht Treaty, and considerable uncertainty remains regarding its evolution through early 2000, the period that will be taken as reference in determining EMU qualification by January 1, 2001.

37. In the first place, the immediate impact of the drachma devaluation of March 1998 (a welcome correction of the exchange rate's overvaluation and, as such, a necessary precondition for sustainable ERM participation) has reversed the downward trend of inflation observed during this decade. An important question is whether the impact of the devaluation on inflation has run its course or whether second-order effects are yet to come. Secondly, Greece's cyclical position, estimated to be more advanced relative to most of its main trading partners,[30] may entail additional upward pressure on wages and prices.

38. This chapter attempts an empirical investigation of the impact of these factors on inflation. To this end, we draw on a variety of methodologies employed in the literature: these include tests based on reduced-form equations, a simple structural model, and a vector autoregression specification. Recourse to such diverse methodologies could be informative on the robustness of the empirical linkages under consideration. In addition, this chapter contains an (informal) discussion comparing the Greek case to the experience of other European countries that experienced large exchange rate depreciations in the 1990s.

39. The relevance of historical relationships to assessing Greece's inflation prospects in the current context is open to question. It could after all be argued that ERM membership constitutes an important policy "regime shift" that may render inferences based on past behavior somewhat dubious. Nonetheless, past trends can still shed light on some of the channels through which exchange rate changes have been transmitted, for instance as regards the wage-price dynamics, and thus contain useful information on what current developments may portend for the inflation outlook.

40. The plan of the chapter is as follows. Section B presents tests based on single reduced-form equation specifications, including a standard simple Phillips curve and a slightly richer specification for the wage equation that allows testing for real wage stickiness. Section C explores the quantitative implications of a simple calibrated structural model. Section D tests the empirical relevance of the linkages under consideration utilizing a simple vector autoregressive model. Section E attempts to place the Greek case in the context of other

---

[29]Prepared by Ioannis Halikias and Nicolas Sobczak.

[30]For a discussion of Greece's potential output, see Chapter I of this paper.

European economies that experienced large depreciations of their exchange rates in recent years. Section F concludes.

B. Single-Equation Specifications

41. This section looks at the empirical performance of some relatively standard wage and price equations to gain an initial insight into the questions under consideration. While the conclusiveness of the empirical results reached on the basis of the simple specifications employed here should not be overstated, the hope is to capture certain underlying features of the wage and price setting process that may prove useful in shedding light on the patterns characterizing the somewhat larger models to be explored further down.

A simple Phillips curve specification

42. The section starts by estimating the influence of the output gap and the exchange rate on the dynamics of inflation, utilizing a standard Phillips curve specification linking price inflation to inflationary expectations and some measure of labor market slack. This reduced-form relation can be thought of as reflecting the process of wage and price formation, under imperfect competition in product markets, wage bargaining, and an exogenously determined "natural" rate of unemployment. In the long run, the Phillips curve is vertical: actual unemployment is at its natural rate which is only affected by supply side factors, while actual inflation equals expected inflation. In the short term, on the other hand, there is a negative relationship between inflation and activity, so that in the case of an adverse demand shock inflation declines below expected inflation.

43. The equation can be written as follows:

$$\pi = \pi^e - \gamma.(U - U^*) + Z$$

where π and π^e stand for actual and expected inflation, U and U^* stand for unemployment and its natural rate, and Z represents the transitory component of other shocks (such as shocks to commodity prices or changes in indirect taxation). Using a simple Okun relation between output and unemployment, the output gap (*gap*) can be substituted for the unemployment gap:[31]

$$\pi = \pi^e + \beta.gap + Z$$

---

[31]Evidence of the significant role of the output gap for inflation in Greece has been provided by Hall and Zonzilos (1996) and Karadeloglou, Papazoglou and Zombanakis (1997), using annual data.

44. Inflation expectations are specified as a weighted average of a forward-looking and a backward-looking component, which implies some inertia in inflation. Inertia may be imparted by less than fully rational expectations, or by the existence of overlapping wage contracts. Thus, expected inflation is expressed as follows:

$$\pi^e = A(L).\pi_{-1} + (1 - A(1)).\pi^*$$

where $A(L)$ is a polynomial in the lag operator L, and π^* is the long-run forward-looking component of expectations, independent of past inflation (the innovation). The latter component moves essentially with the credibility of monetary policy, and foreign inflation (in drachmas). Allowing for short-run dynamic effects of the output gap, the equation to estimate is written as follows:

$$\pi = A(L).\pi_{-1} + (1 - A(1)).\pi^* + B(L).gap + Z$$

The lack of quarterly data for GDP in Greece complicates the equation's estimation at higher than annual frequency. To this end, we constructed monthly and quarterly series for GDP, interpolating annual data with a composite indicator index.[32] The equation is thus estimated with quarterly data for the period covering 1981–97. The year-on-year inflation rate is regressed on its past values, past values of the output gap, and foreign inflation (in drachmas). To avoid simultaneity problems, the contemporaneous value of the output gap is not included in the regression.

45. After selection of the lag and elimination of nonsignificant terms, the estimation gave the following equation (Student t-statistics are shown in parenthesis below the estimated coefficients):

$$\underset{}{\pi} = \underset{(1.7)}{0.79\%} + \underset{(18.5)}{0.80}\ \pi_{-1} + \underset{(5.4)}{0.15}\ \pi_f + \underset{(3.1)}{0.24}\ gap_{-2}$$

$$R^2 = 0.94 \qquad \sigma = 1.05\%$$

where π_f is foreign inflation in drachmas.

---

[32] Following the construction proposed in Christofides (1995) the composite indicator was estimated as the monthly forecast derived from an error correction equation relating GDP to industrial production, cement consumption, retail sales (all in volume), and registered unemployment. Residuals are added to this dynamic forecast so that the GDP monthly series remains consistent with annual data. As a result, the annual average of the monthly or quarterly output gap coincides with the annual output gap computed in Chapter I of this paper.

46. The equation tracks in a satisfactory manner actual inflation since the beginning of the 1980s (Figure 7).[33] Inflation appears sensitive to the business cycle as the output gap enters the relation significantly. Foreign inflation in drachmas, and therefore variations in the nominal effective exchange rate, also appear to play a crucial role. In the short run, 15 percent of an increase in foreign prices expressed in drachmas (resulting either from an increase in prices abroad or from a depreciation of the drachma's exchange rate) is passed on to inflation.[34] In the long run, the overall pass-through is close to 80 percent, and not significantly different from one. This would suggest that exchange rate depreciations have a strong impact on domestic inflation in the long run. The causality may also be reversed, however: it may well be the case that, historically, exchange rate depreciations have always fully accommodated the inflation differential between Greece and its main trading partners.

47. The coefficient on lagged inflation is high, showing a marked degree of inertia in the inflation dynamics. It is significantly different from one, which would exclude the existence of a unit root. However, the R^2 from the regression appears very high, and unit root tests on domestic inflation and foreign inflation may indicate nonstationary variables. The correlations presented above could thus be spurious. We therefore checked the robustness of the significant influence of the output gap with an error-correction specification which takes into account possible nonstationarity.

48. The long-term cointegrating relationship between domestic inflation and foreign inflation is simply a relative purchasing power parity relation, as the annual growth rate of the real exchange rate is stationary. The estimation gave the following short-term equation:

$$\Delta\pi = \underset{}{-0.05\%} + \underset{(5.7)}{0.19}\,\Delta\pi_f + \underset{(2.6)}{0.20}\,gap_{-2} - \underset{(3.0)}{0.09}\,(\pi - \pi_f)_{-1}$$
$$\underset{(0.4)}{}$$

$$R^2 = 0.37 \qquad \sigma = 1.03\%$$

These last estimates confirm the results of the previous equation: the output gap appears significantly, with a coefficient of 0.2; the short term direct pass-through of foreign prices stands at around 20 percent, and converges gradually to one.

The relevance of real wage rigidity

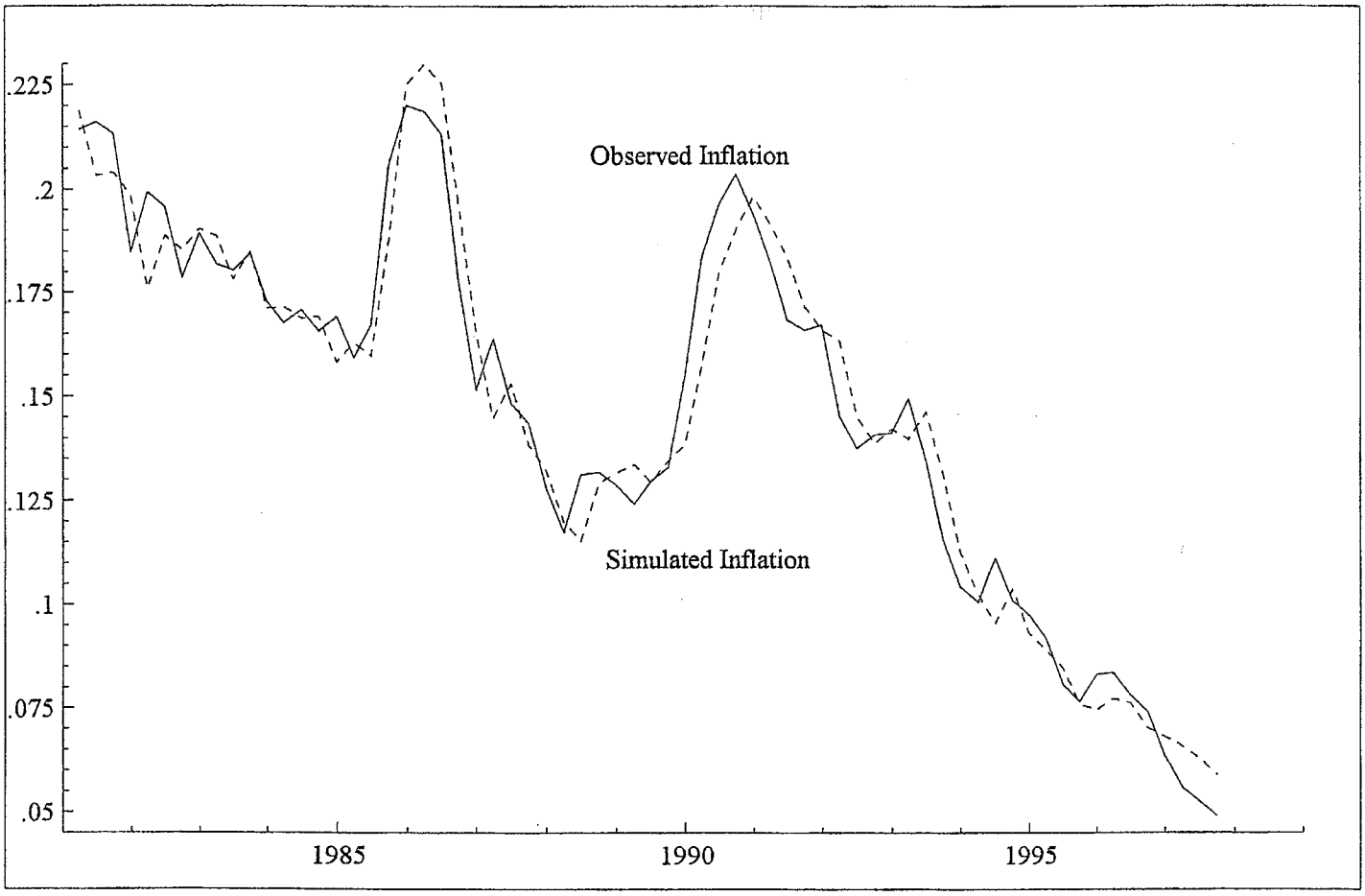
49. The extent of real wage rigidity can be a crucial determinant of the pattern by which changes in the exchange rate are passed through to prices. If wages are totally rigid in real

---

[33] The equation was also estimated correcting for possible autocorrelation of the residuals: the results were similar.

[34] This estimate is slightly lower than the a priori estimate of the direct pass-through to domestic prices due to import prices, based on the share of imported goods and services in private consumption, which is about 20–25 percent.

Figure 7. Greece: Simulation of the Phillips Curve



Sources: Greek authorities and staff estimates.

terms (and output prices are flexible), a change in the nominal exchange rate cannot affect the real exchange rate: in the case of a nominal devaluation, the impact would be an immediate proportional increase in the domestic price level—hence the importance of testing for the relevance of real wage rigidity in the case of Greece.

50. The specification employed in the previous subsection (when cast in terms of wage inflation rather than price inflation), while revealing in many respects, is not entirely suitable to address the question at hand. Its main drawback is that it constrains current (and future) wage settlements not to depend on the history of past errors in forecasting prices (and, hence, the real wage). For instance, a specification along the lines of the previous subsection would imply that, even if the current real wage is the ex post low outcome of a surprise devaluation, such an outcome would have no bearing on future wage settlements. This embodies the very strong assumption that organized labor will not resist a decline in real wages. Research on a number of European countries[35] has cast doubt on the validity of this assumption—in the specific case of Greece, it runs counter to the preponderance of catch-up clauses in wage settlements to correct for inflation surprises.

51. To address this problem, an error correction specification along the lines suggested in Obstfeld (1997) was adopted. Under this specification, nominal wage dynamics are driven by the absolute level of the real wage, as well as by the degree of slack in the economy. Moreover, past inflation forecast errors are explicitly allowed to affect current wage demands. In relation to the previous subsection, the degree of slack is captured by the output gap, as well as the change in the output gap, in order to allow for hysteresis effects that have characterized the experience of European economies.

52. The specification that forms the basis of the estimation can then be written as follows:

$$\Delta w_t = E_{t-1}\Delta p_t - p(w_{t-4} - p_{t-4}) - \gamma gap_{t-1} - \delta \Delta gap_{t-1} + \beta(p_{t-1} - E_{t-2}p_{t-1}),$$

where w and p are the (logs of) wages and prices, and Δ and E are, respectively, the first difference and expectations operator. According to the above equation, Δw_t is a function of current inflation expectations (π^e_t), the lagged real wage (RW_{t-4}), gap_{t-1}, Δgap_{t-1}, and the lagged forecast error of the price level (ERR_{t-1}).[36] In this specification, real wage rigidity would imply a coefficient on expected inflation close to 1, a negative coefficient on the lagged real wage term, and a positive coefficient on the forecast error term.

---

[35]See, for example, Bean (1994) and Layard and others (1991).

[36]The forecast error is defined as the difference between the (log of) the actual price level and the expected price level on the basis of last period's information set. For the purposes of this subsection, and following Obstfeld (1997), inflationary expectations were estimated by regressing inflation on its own lags, lags of nominal wage growth, and lags of import price inflation.

53. The above equation was estimated by ordinary least squares. The estimation results, using quarterly data over the period 1981–1997, are as follows (t-statistics in parenthesis):

$$\Delta w_t = \underset{(1.0)}{0.03} + \underset{(4.5)}{0.77}\ \pi^e_t - \underset{(2.1)}{0.29}\ RW_{t-4} + \underset{(1.4)}{0.18}\ gap_{t-1} + \underset{(3.9)}{3.98}\ \Delta gap_{t-1} + \underset{(1.5)}{0.20}\ ERR_{t-1}$$

$$R^2 = 0.42 \qquad \sigma = 3.5\%$$

54. The estimation results summarized above to some extent lend support to the results of the simple Phillips curve of the previous subsection. In particular, the point estimate of the coefficient of expected inflation is remarkably similar to that obtained by the simple Phillips curve specification. In fact, under the richer specification of this subsection, a Wald test cannot reject the hypothesis that this coefficient is equal to 1.[37] On the other hand, inclusion of the *Δgap* term, while not materially affecting the point estimate of the gap coefficient, tends to lower its significance level. The estimated coefficient of the *Δgap* term itself suggests that the relevant effect is strong, indicating that hysteresis may indeed be an important feature of the Greek economy.

55. The estimation results concerning the additional variables considered in the richer specification of this subsection also lend support to the hypothesis that real wage stickiness may be quite extensive in the case of Greece. The impact of the lagged real wage was estimated to be particularly strong, suggesting that targeting of the level of the real wage by trade unions could be quite pervasive. At the same time, the coefficient on the forecast error term, while marginally insignificant, turned out to be correctly signed. In general, the estimated impact of the variables in question tended to be stronger, and the overall equation fit superior, relative to the cases studied by Obstfeld (1997),[38] suggesting that real wage rigidity may be more relevant in the case of Greece relative to its major trading partners.

56. The empirical results summarized above provide an indirect indication that exchange rate changes may have tended to exert a strong impact on prices in the case of Greece, and

---

[37]Estimating the equation by constraining the coefficient on expected inflation to equal 1 points to an even stronger impact of the lagged real wage, lagged change in the gap and lagged forecast error:

$$\Delta w_t = \underset{(1.8)}{0.01} + 1.00\ \pi^e_t - \underset{(3.8)}{0.42}\ RW_{t-4} + \underset{(1.3)}{0.17}\ gap_{t-1} + \underset{(4.1)}{4.13}\ \Delta gap_{t-1} + \underset{(1.8)}{0.42}\ ERR_{t-1}$$

$$R^2 = 0.44 \qquad \sigma = 3.6\%$$

[38]Obstfeld (1997) tests this specification on Belgium, France, Germany, Italy, the Netherlands, and Spain. The estimated coefficient on the lagged real wage variable was in a range of -0.07 to -1.23, and the average R^2 for the countries studied was 0.38.

that this impact may have been both swift and rather persistent, with wage behavior being a potentially important transmission channel. In particular, evidence of extensive real wage stickiness, at least in comparison with other European countries examined by Obstfeld (1997), would suggest that a change in the drachma's exchange rate has tended to pass through to wages and prices relatively quickly. Moreover, the estimated tendency of wage settlements to correct for past real wage surprises, and evidence of hysteresis, point to a wage-price dynamic that would tend to render the effect on inflation of even temporary shocks to the exchange rate relatively persistent.

C. Small Structural Model

Simulations of a structural model of wage and price formation

57. This section examines more closely the links between prices, wages and activity after a devaluation. As a first step, the effects of the devaluation and other policy measures on the macroeconomic environment are estimated with a standard macroeconometric model (Oxford Economic Forecasting, 1995). This provides the evolution of the unemployment rate (or the output gap), which is used as input in a small monthly model describing the joint dynamic of prices and wages. The response of wages, consumer prices, producer prices, and import prices to the devaluation is then totally endogenous, providing the basis to discuss different scenarios.[39]

A calibrated structural model for wages and prices

58. A standard wage-price model was constructed for Greece. Wages, consumer prices, producer prices, and import prices are endogenous. The main exogenous variables are the exchange rate and the unemployment rate. They summarize the macroeconomic environment which affects the behavior of prices and wages and will be related to macroeconomic policy through the Oxford Economic Forecasting (OEF) model. Autonomous shocks to endogenous variables can also be examined to take account of, for example, real wage moderation, or a squeeze in producer markups and on importers' and retailers' margins. As the aim is to assess the response to the devaluation shock and to the post-devaluation policy package, all variables are expressed as deviations from a baseline, pre-devaluation projection. The forecast for inflation is then constructed as the deviation induced by all new developments following the devaluation.

59. The equations are all specified in error correction form. The long-term specification consists of standard wage and price equations. Import prices are modeled as a weighted average of foreign prices expressed in drachmas and domestic prices (implying, to some extent, pricing to market behavior). Consumer prices are specified as a weighted average of

---

[39]Theoretically, one should also try to assess the feedback effect of wage and price developments on activity, and make iterations between the two models. These second-round effects should however be small, and are not considered here.

import prices and domestic prices. The wage equation results from a bargaining model, as for example in Layard, Nickel, and Jackman (1991): unions target a real wage which is indexed on labor productivity and depends negatively on the unemployment rate. Finally, producer prices are determined as a constant markup over unit labor costs. Formally, the long-term relationships are expressed as follows (all variables, except for the unemployment rate, are expressed in logarithms):

Import Price Setting

$$p_m = \alpha.(p* + e) + (1-\alpha).p + Z_m$$

where $p*$ is the foreign price, e the nominal exchange rate, p the domestic producer price, and Z_m represents factors that might influence importers' margins or the terms of trade (for example, a shock in commodity prices).

Consumer Price Setting

$$p_c = \beta.p_m + (1-\beta).p + Z_c$$

where Z_c represents factors that might modify retailers' margins, or special factors such as indirect taxes.

Wage Setting

$$w = p_c + a - \gamma.U + Z_w$$

where w is the cost of labor, a is labor productivity, U is the unemployment rate, and Z_w represents all the "labor-cost push" factors (unemployment benefits, tax wedge, unions bargaining power, firing costs, etc.).

Producer Price Setting

$$p = w - a + Z_p$$

where Z_p is the producer markup which would depend on the degree of competition in product market or the costs of other factors of production (oil prices, non-oil commodity prices, real interest rate, etc.).

60. The following long term calibration was chosen:

$$p_m = p^* + e + Z_m \qquad w = p_c + a - 0.7U + Z_w$$

$$p_c = 0.2p_m + 0.8p + Z_c \qquad p = w - a + Z_p$$

The calibration presented above warrants a brief discussion. Import prices generally tend to adjust fully to exchange rate shocks. Disaggregated data on imports and the consumer price index indicate that the share of imported goods and services in private consumption stands at slightly over 20 percent. These two calibrations imply that the direct import price effect of a devaluation is close to 20 percent of the initial shock, which is consistent with the elasticity of foreign prices expressed in drachmas displayed in the reduced form of the Phillips curve estimated in the previous section. The long-run semi-elasticity of real wages to the unemployment rate is taken from the estimation of a wage equation for Greece in OECD (1997). The OECD results indicate that the long-run sensitivity of wages to unemployment in Greece stands at around the average of OECD countries. This elasticity is also consistent with the estimated sensitivity of inflation to the output gap from the Phillips curve of the previous section: on the basis of a typical Okun coefficient in the range of 0.4–0.5, the implied elasticity of inflation to the output gap would be about 0.3, close to the point estimate of the corresponding coefficient in the reduced-form Phillips curve estimated above.

61. An error correction model is then constructed by combining error correction terms from the long-run equations with terms capturing the short-run dynamics of the growth rates of each endogenous variable. These monthly dynamics are also calibrated, and are adjusted to produce reasonable responses to simple shocks. The main differences between the four short-run dynamics lie in the speed of adjustment to the long-term target. The long-term effect is reached rapidly (a few months) in the case of import prices and consumer prices, as these equations are essentially accounting identities, while deviations from the long-run equilibrium are more persistent in the case of producer prices and, especially, wages (because of overlapping contracts).

The macroeconomic environment

62. Before simulating the wage and price model, the effects of the devaluation and of the accompanying fiscal measures on activity were assessed with a standard macroeconometric model drawn from the OEF.[40]

---

[40]The OEF model does not include a specific block of equations for Greece. We therefore took as a basis the results obtained for Spain, a country whose economic structure presents certain similarities to that of Greece, especially in terms of size of the public sector and openness to trade. The share of imports in GDP is comparable for the two countries, but

(continued...)

63. The main hypotheses were as follows. The ERM central rate set in March 1998 would imply a 14 percent increase in foreign prices (barring pricing-to-market behavior). The drachma has, however, remained well above its central rate so far in 1998, and we have assumed that it will move only partly toward its parity by end-year. It is then postulated to converge gradually to its ERM central rate, reaching it by end-2000, entailing a further depreciation in both 1999 and 2000. This exchange rate path should be interpreted merely as a working assumption for simulation purposes; it is clearly not a projection of future developments. On the fiscal front, the devaluation is calculated to increase primary expenditures by 0.4 percentage points of GDP in 1998, while also raising debt servicing costs. In response, the authorities have defined a set of measures (cuts in public investment, government consumption and transfers, and higher social security contributions from legalized immigrants), in order to achieve the budgeted general government deficit of 2.4 percent of GDP.

64. The net effect of the devaluation and the corrective fiscal measures is calculated to have an expansionary impact on GDP. By end-1999, the model stimulations indicate that the output gap would narrow by 0.4 percentage points of GDP (relative to a baseline, pre-devaluation projection). The devaluation boosts activity through higher net exports, and implies an effective easing of monetary conditions. At the same time, the fiscal stance remains broadly unchanged between the pre- and post-devaluation situations, as the announced fiscal adjustment offsets only the direct effect of the devaluation on the fiscal accounts, and aims for an unchanged deficit.

The effects on inflation

65. In the short run, the direct impact of higher import prices will mechanically increase domestic inflation. Disaggregated data on imports and the consumer price index indicate that the share of imported goods and services in private consumption stands at slightly over 20 percent. The 14 percent increase in foreign prices implied by the ERM central rate set in mid-March would thus imply a 2¾–3½ percent increase in consumer prices in the following months. However, the actual depreciation of the drachma is, at present, smaller. If, as outlined above, we assume that, at the end of 1998, the effective depreciation will be about 10 percent, the direct effect can be roughly estimated at 2 percent.

---

[40](...continued)
exports only represent about 15 percent of GDP in Greece while they amount to 25 percent of GDP in Spain. The expansionary impact of the devaluation on Spain was reduced accordingly for Greece. The simulation also provides results for inflation and wage increases, but we were more reluctant to use them, as there is no indication that the wage and price formation process in Spain is comparable to that of Greece.

66. After the initial shock, three factors are expected to contribute to higher inflation:

- the drachma will need to converge toward its central rate in anticipation of EMU entry. The remaining depreciation by end-2000 could mechanically increase inflation by 0.2 percent each year, although this will obviously be dependent on the path of the exchange rate movement;

- unit labor costs are set to increase as a result of the wage catch-up clauses on past inflation contained in the national agreement reached in May 1998.[41] Such clauses are likely to add a percentage point increase to wages in January 1999, and another appreciable increase in January 2000, as inflation is projected to exceed the thresholds established for 1998 and 1999;

- demand pressures are set to increase, reflecting the devaluation's impact on activity.

67. The model was simulated using the assumptions on the exchange rate and the impact on activity as calculated above. We also calibrated a shock on wages, taking into account that the wage agreement was not unduly influenced by the devaluation; indeed, it did not deviate appreciably from the one under negotiation prior to ERM entry. However the catch-up clause will add a 1 percent increase in January 1999, attributable to the effect of the devaluation. If the mechanical impact of the devaluation is, as noted above, a 2 percent increase, this would imply a 1 percent ex ante moderation in real wages compared to a counterfactual full-indexation scenario. Moreover, given the understanding to moderate sectoral wage increases, the premium introduced at the sectoral level could be somewhat lower than in previous years: a supplementary 0.5 percent moderation in real wages is thus assumed. As a result, total real wage moderation is postulated to be about 1½ percent for the two years, 1998 and 1999.

68. The simulations indicate that, compared to the pre-devaluation baseline scenario, year-on-year inflation would initially increase by some 2 percentage points during 1998, because of the direct import price effect. Thereafter, the stimulus to activity stemming from the devaluation and the working of catch-up clauses would push wages up to about ¾ percentage point above their baseline value during 1999. This would sustain the inflationary effects of the devaluation beyond the mechanical impact on import prices: inflation would still be about 1 percentage point higher than in the pre-devaluation scenario. In 2000 and beyond, with the end of the wage agreement and the impact of residual catch-up clauses, wages would

---

[41]The accord covers two years; for 1998, it provides for an increase of 2.7 percent in January (inclusive of a 0.2 percentage point catch-up for the overrun from targeted inflation in 1997) and of 2 percent in July; for 1999, the increase is set at 1.4 percent in both January and July, plus a catch-up (capped at 1 percent) if end-1998 inflation exceeds 3½ percent (which we project to be the case). Any deviation of end-1998 inflation in excess of the 1 percent cap would be compensated at the beginning of 2000; at that time, there would also be a catch-up in end-1999 inflation exceeded the official target of 2 percent. The national accord sets the increase in the minimum wage; the two sides of industry have advised that second-tier sectoral accords should not deviate appreciably from the national agreement.

accelerate to recover the loss conceded in the two previous years (as wage formation is in terms of a targeted real wage): wage inflation could thus be more than 2 percentage points higher than its counterfactual value in 2000, and consumer price inflation 1½ percentage points higher (see Box for details; note that all figures are expressed as deviations from a baseline pre-devaluation scenario).

Inflation forecast

69. The new forecast is constructed as the sum of the pre-devaluation forecast (baseline) and the estimated effects of all new developments (devaluation, fiscal measures, wage agreement). The staff's forecast prepared prior to the devaluation in the context of the WEO exercise is taken as a baseline.[42]

70. On this basis, year average inflation is expected to be around 5 percent in 1998, declining to 3.8 percent in 1999. The 12-month average inflation rate in March–April 2000 (the reference period for EMU entry in 2001) is projected at 3½ percent, somewhat above the likely Maastricht threshold.

Inflation Forecast After Devaluation

	1997	1998	1999	2000
Annual	5.5	5.0	3.8	3.0
End of year	4.7	4.7	3.4	2.7

An illustrative scenario with further fiscal adjustment

71. The deviation from the expected Maastricht criterion for inflation is however not of a magnitude that could not be corrected through additional fiscal tightening. Model simulations suggest that a reduction in public expenditures of 1–1¼ percentage points of GDP (over 1998 and 1999) would impart the fiscal withdrawal necessary to comply with the inflation criterion (assumed to be slightly under 3 percent in March–April 2000). On the basis of a fiscal multiplier for public consumption of slightly less than 1, the output gap would widen by roughly ½ percent of GDP by the end of 1999—instead of the above noted narrowing by 0.4 percent of GDP relative to the pre-devaluation baseline.[43] As a result, demand pressures would be alleviated and the 12-month average inflation rate in March–April 2000 would be

[42]In that projection, end-of-year inflation was expected to decline from 4.7 percent in December 1997 to 2.8 percent in December 1998 and 2.4 percent by end-1999.

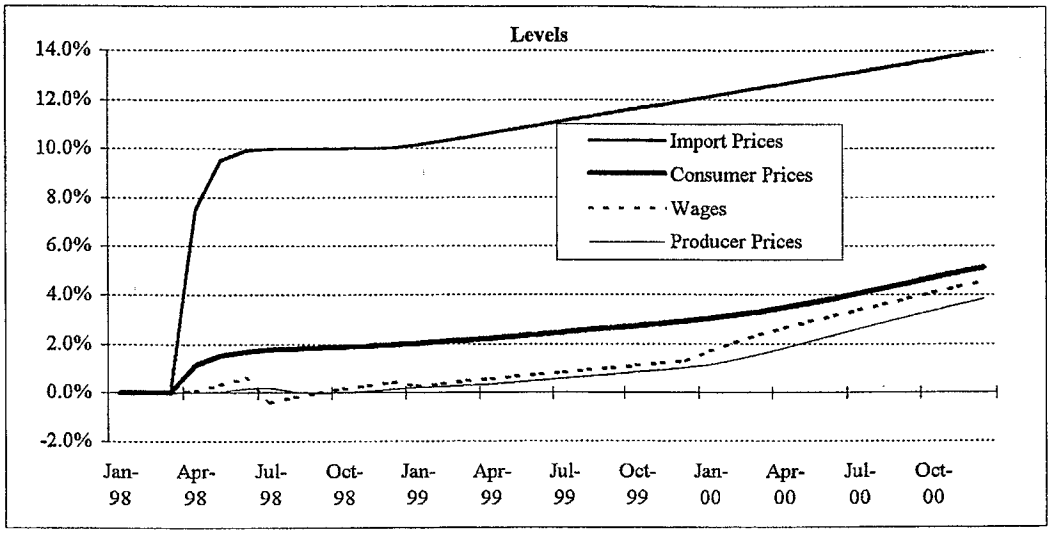
[43]Growth would be reduced by approximately ¼ percent in 1998 and ¾ percent in 1999. This would still leave room for a continued moderate recovery, with GDP growth slightly below 3 percent in 1998 and 1999.

Box: Impact of the Devaluation, Fiscal Measures, and Wage Agreement

(Deviations from baseline)

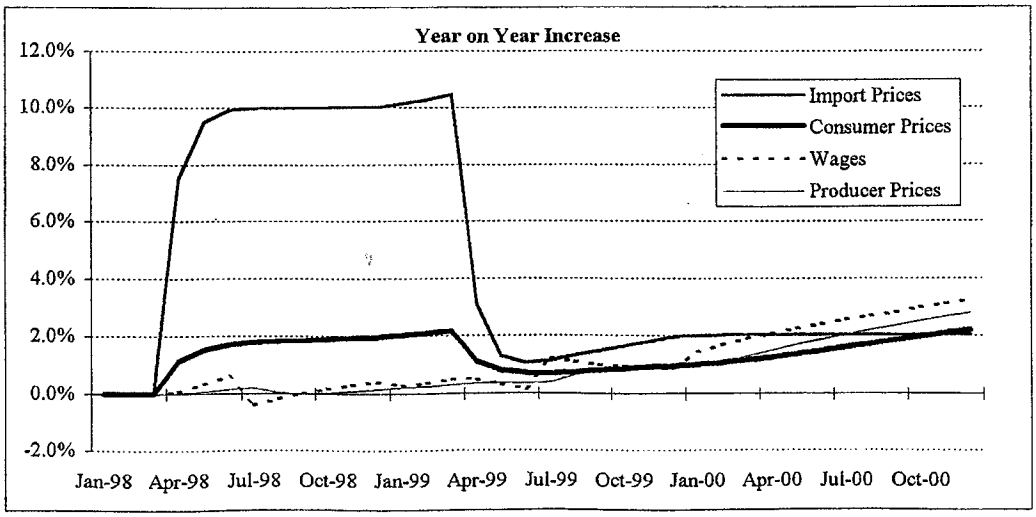
Annual average levels

	Import Prices	Consumer Prices	Wages	Producer Prices	Unemployment Gap
1998	7.2%	1.3%	0.1%	0.1%	0.0%
1999	11.0%	2.4%	0.8%	0.6%	-0.2%
2000	13.1%	4.0%	3.2%	2.5%	-0.4%



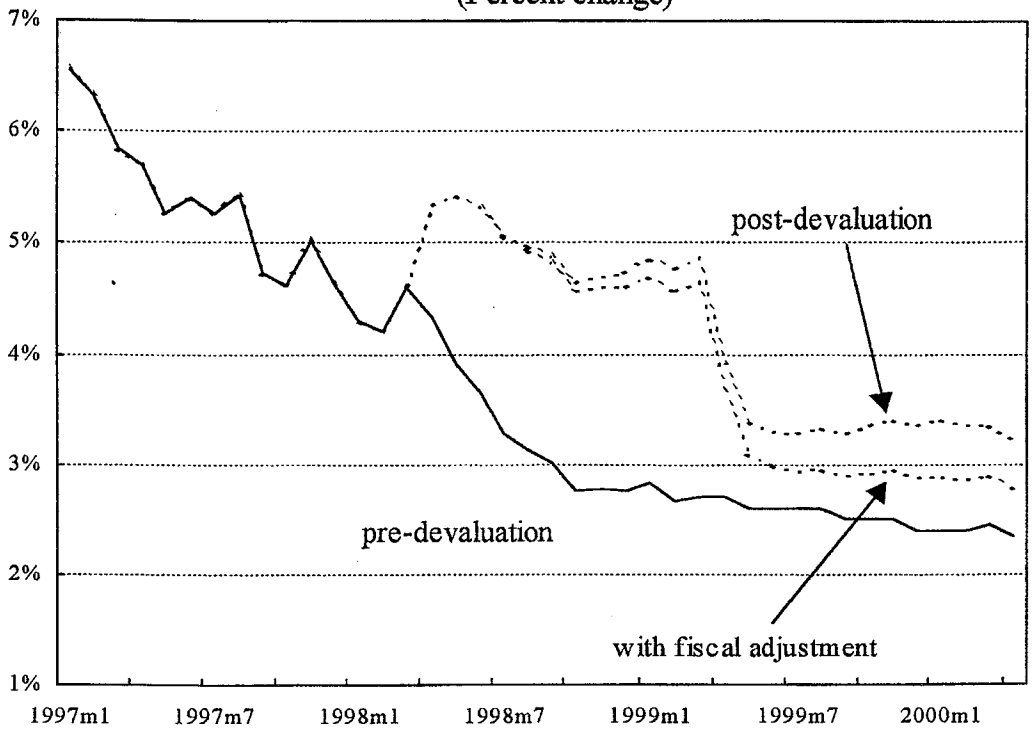
Annual changes

	Import Prices	Consumer Prices	Wages	Producer Prices	Unemployment Gap
1998	7.2%	1.3%	0.1%	0.1%	0.0%
1999	3.8%	1.2%	0.7%	0.5%	-0.2%
2000	2.0%	1.6%	2.4%	1.9%	-0.2%



below 3 percent (Figure 8). While clearly only illustrative, these simulations show that the inflation target could be reached with relatively limited additional fiscal adjustment.

Figure 8. Year-on-Year Inflation Forecast
(Percent change)



Source: Greek authorities and staff estimates.

D. A Simple VAR System

72. This section employs yet another empirical methodology to explore the impact of a change in the drachma's exchange rate on inflation. Specifically, it estimates a simple vector autoregressive (VAR) system that includes the variables considered in the preceding sections of this chapter.

Description of the methodology

73. Since the introduction of the VAR methodology by Sims (1980, 1982), and its further refinement by Litterman and Weiss (1984), VAR models have become a popular empirical tool in macroeconomics. The appeal of VAR models is mainly due to their simplicity, their good forecasting record, and the need to impose relatively few restrictions to achieve identification. At the same time, the unrestricted nature of the lag structure in VAR models provides a good safeguard against a host of econometric problems—notably spurious correlation and co-integration problems.

74. In essence, VAR models attempt to explain a set of variables in terms of the lags of all the variables under consideration. Denoting the vector of variables of interest by Y, the usual starting point is to estimate a reduced-form system of the type:

$$Y_t = \sum_{1}^{n} C_i Y_{t-i} + y_t$$

where C_i is an unrestricted matrix of coefficients and y_t is a serially uncorrelated vector of residuals.

75. A VAR model seeks to study the impact of changes in the elements of the vector of innovations y_t on all the variables of the system. However, to achieve this, one typically utilizes a vector of orthogonal components of the estimated elements of y_t, that is, a vector whose elements are uncorrelated to each other, rather than the estimated vector y_t itself. There are a number of advantages in this approach: perhaps the most fundamental is that, to the extent that a variable has historically tended to move together with other variables, it would be rather misleading to talk about a shock to this variable in isolation; orthogonalization takes such co-movement into account.[44] Once a vector of orthogonal components of y_t has been constructed, one can compute the so-called **impulse response functions**, which summarize the impact of a shock to the (orthogonal component of) each variable under consideration on all other variables of the system (including itself) over a specified period of time.

76. For the purposes of this section, the orthogonal decomposition of vector y_t was achieved by imposing a strictly recursive contemporaneous structure to the system. This essentially entails placing the variables under consideration in a particular order, with the innovation to the first assumed not to be affected contemporaneously by the (current) innovation to any of the other variables, the innovation to the second assumed to be affected contemporaneously only by the innovation to the first, and so on. The particular ordering chosen is typically justified on the basis of relative information lags pertaining to the variables of the system, but this criterion is not always unambiguous.

Estimation results

77. A simple VAR system was employed, including the variables that have been discussed so far. Specifically, the VAR system under consideration includes, in that order, the year-on-year rate of change in the drachma's nominal effective exchange rate, the output gap, the year-on-year rate of wage inflation, and the year-on-year rate of consumer price inflation. For the

---

[44]It is also convenient from an econometric viewpoint: as orthogonalized innovations are by definition uncorrelated, it is very straightforward to compute the variances of linear combinations of them.

estimations, a 2-lag structure was selected.[45] This ordering imposes contemporaneous exogeneity of the exchange rate, which can be justified on the basis of a policy regime of exchange rate targeting. The ordering of the remaining variables can be justified on the basis of observed wage inertia which should preclude a contemporaneous impact of a price shock on wages and economic activity.

78. The model was estimated using quarterly data over the period 1987–1997. The sample period was chosen to take into account fundamental, and interrelated, changes in the financial system and the monetary policy regime, as well as important changes in the wage-setting process. In particular, the post-1986 period was one of extensive financial liberalization, which included the gradual abolition of administered bank interest rates and credit allocation rules. The post-1986 period also saw a major shift in monetary policy regime, with the drachma's exchange rate becoming an increasingly important intermediate target, culminating in the adoption of publicly announced target ranges for the exchange rate relative to the ECU since 1993. Moreover, in the period under consideration, collective bargaining agreements became the main determinant of private sector wages, with the (until then prevalent) role of incomes policies strictly confined to the public sector. On this basis, one could expect that the chosen sample, as opposed to a longer one, would constitute a much safer ground to draw inferences regarding future developments. For the sake of comparison, and to highlight the important implications of the abolition of private sector incomes policies for the pass-through of exchange rate changes to prices, estimation results based on a larger sample are presented further down.

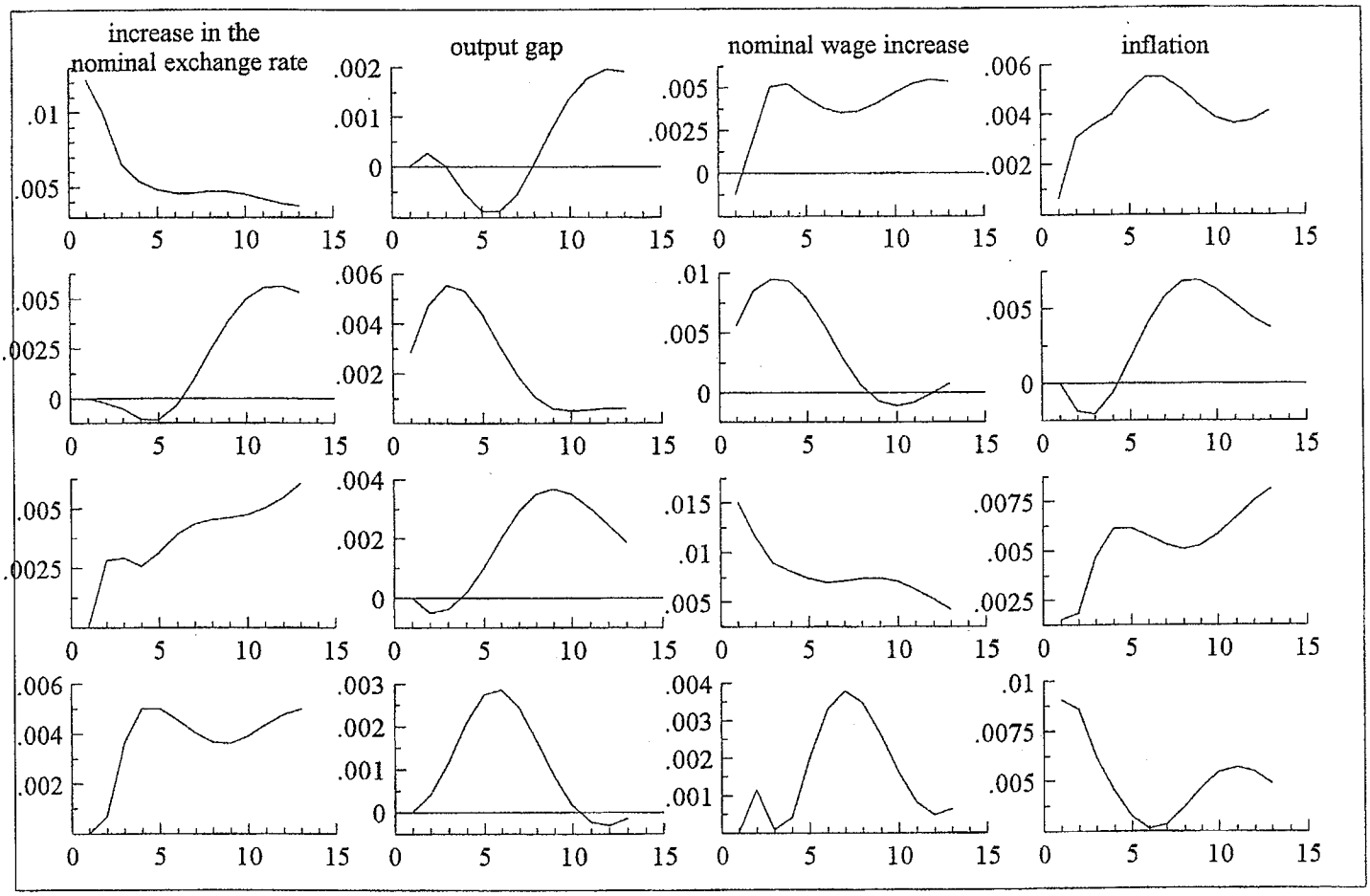
79. Figure 9 presents the impulse response functions for each of the variables of the VAR system described above, over a 12-quarter horizon. As discussed in the previous subsection, the impulse response functions trace how the impact of a shock to an innovation in each variable is propagated through the system, taking into account the interdependencies with all other variables implied by the model. For the purposes of this section, a shock was defined as a 1 standard deviation increase in the innovation of each variable—for the exchange rate variable, an increase represents a drachma depreciation.

80. With regard to the main question of interest for this chapter, that is, the impact of exchange rate changes on prices, the picture emerging from Figure 9 is broadly in line with the results of the previous sections, and in particular with the inferences made on the basis of simple price and wage equations. Thus, a drachma depreciation of the size implied by the ERM parity can be seen to entail a wage-price spiral that is quite persistent. Nominal wage growth tends to pick up immediately, reaching a peak of 5 percentage points above its baseline path three to four quarters after the shock, and remaining at roughly that level throughout the simulation period. Price inflation tends to follow suit with a lag of about one-quarter, reaching a peak of some 6 percent above its baseline path and remaining slightly

---

[45]A likelihood ratio test indicated that restricting the length of the lag structure from four to two does not entail significant information loss.

Figure 9. Greece: Impulse-Response Functions of the VAR Estimated on 1987-97



Sources: Greek authorities and staff estimates.

below that level throughout the simulation period. This type of persistence is striking, given that the exchange rate shock itself is rather transitory, dissipating within three quarters. Such persistence would appear consistent with the previous findings of a rapid response of wages to inflation expectations, and the prevalence of real wage targeting and hysteresis. At the same time, output responds with a rather long lag to the exchange rate shock, with the effect turning positive only two years after the shock, and the output gap reaching a peak of 2 percent above its baseline path toward the end of the simulation period. This timing in the response of output could also contribute to wage and price pressures long after the exchange rate shock has dissipated.

81. The impulse response functions associated with shocks to the innovations in the other variables of the VAR system also contain a number of noteworthy features. In particular, output shocks turn out to be quite persistent: a 0.3 percent positive shock to the output gap brings the gap to a peak of 0.6 percentage points above its baseline level, with output remaining above its baseline path two years after the shock. The path of wage growth closely mirrors that of output, reaching a peak of 1 percent above baseline a year after the shock, and falling back to its baseline level two years after the shock. Interestingly, prices tend to respond with a substantial lag: price inflation starts to rise above its baseline path only a year after the shock and, after reaching a peak of 0.8 percent above baseline two years after the shock, stays above its baseline level for the remainder of the simulation period. The positive association between output and inflation (albeit with a lag) points to the dominance of demand over supply disturbances as the main driving factor underlying output fluctuations over the estimation period. While the general specification of the VAR system under consideration precludes any firm conclusions, it can be conjectured that shocks to fiscal policy probably constitute an important part of the story in this regard.

82. Positive shocks to wage growth tend to be associated with rising price inflation and a depreciation of the drachma's exchange rate. Thus, a positive shock to the innovation of wage growth of 1.5 percent entails an immediate acceleration of price inflation which keeps rising to reach a level of 1 percent above baseline by the end of the simulation period. At the same time, the wage shock tends to be associated with a depreciation of the drachma, with the rate of nominal effective depreciation reaching a level of 0.8 percent above its baseline path by the end of the simulation period. It is interesting to note that the impact of the positive wage shock on output tends to be expansionary: the output gap tends to rise one year after the shock to a peak of 0.4 percentage points above baseline some two years after the shock. This pattern may suggest that the positive impact of higher wage growth on domestic demand tends to outweigh its negative impact on the supply side of the economy, at least over the length of the simulation period.[46]

---

[46]On the other hand, it could be conjectured that this positive association may reflect the impact on both wages and output of missing variables from the VAR system; in this regard, fiscal shocks could be important.

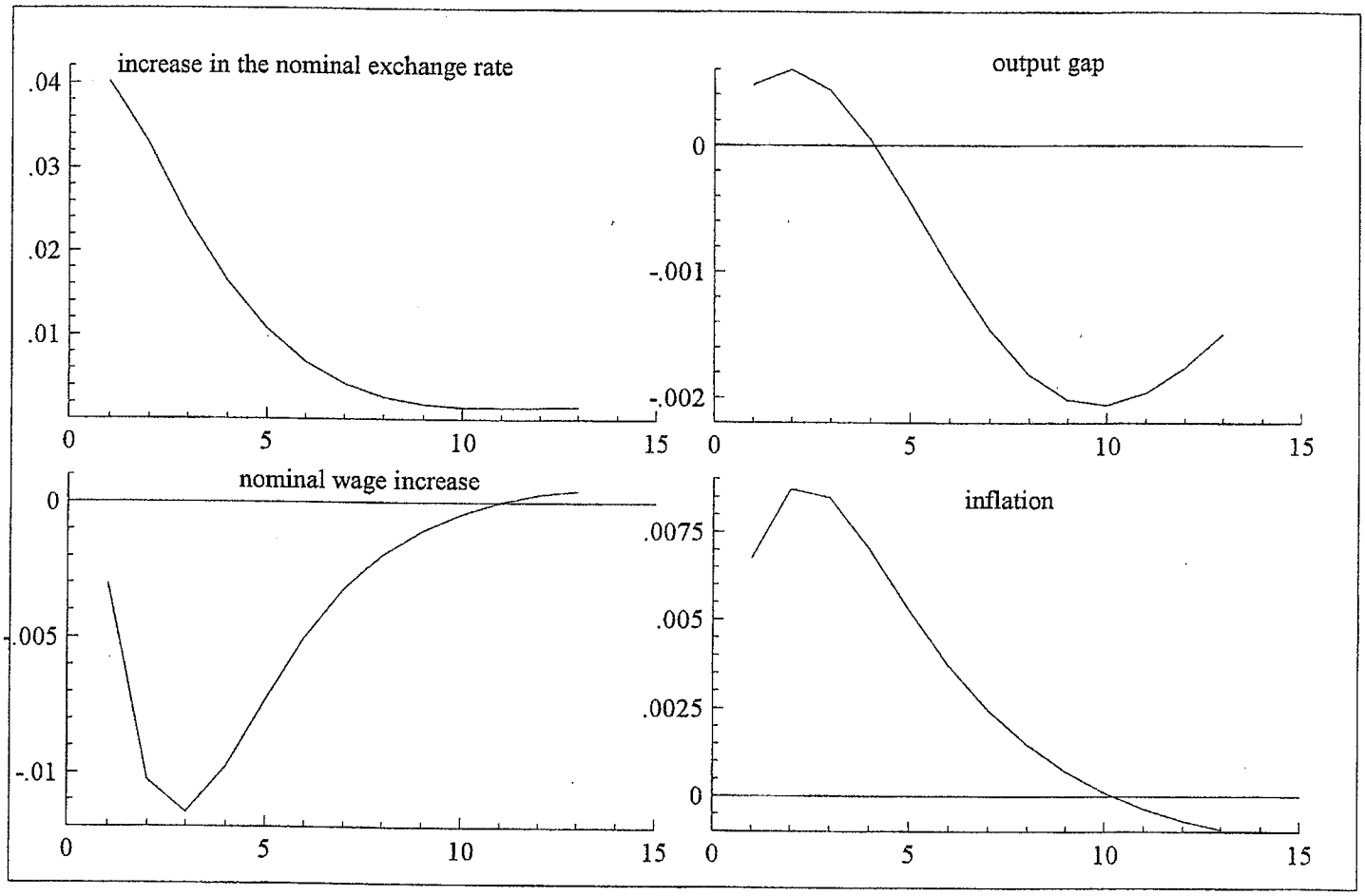
83. Finally, positive shocks to price inflation tend to be associated with an acceleration of wage growth, nominal effective depreciation, and an increase in the output gap. Thus, a 0.8 percent positive shock to the innovation of price inflation, which tends to dissipate within a year, entails an acceleration of wage growth, which reaches a peak of 0.4 percent above baseline a year and a half after the shock, and a steady increase of the drachma's rate of depreciation, which reaches 0.6 percent above its baseline level by the end of the simulation period. At the same time, the impact of the inflation shock on output tends to be expansionary, with the output gap reaching a peak of 0.3 percentage points above baseline a year and a half after the shock; once again, this pattern is consistent with the dominance of demand over supply disturbances during the period under consideration.

84. A central finding of this section was that exchange rate shocks tend to have a strong and persistent impact on price inflation, with wages being an important transmission variable. An interesting question in this regard is to what extent the ending of a formal incomes policy in the private sector during the period under consideration may have had a bearing on this pattern. To gain some insight into this question, the VAR system was re-estimated to include an earlier period, 1981–87, when incomes policies constituted an important determinant of wage developments. It should be emphasized that exchange rate shocks over this earlier period, and hence the estimation results, are very much dominated by the 1985 drachma devaluation. In turn, in the immediate wake of this devaluation, collective bargaining agreements were suspended, base wages were frozen, and the impact of the devaluation was explicitly excluded from the then-prevailing wage indexation scheme.

85. The impulse response functions relating to an exchange rate shock, based on the estimation results over the earlier period, are presented in Figure 10. The picture emerging on the basis of the earlier sample is quite different from the estimation results based on the later (and more relevant) sample. In particular, the impact of an exchange rate change on inflation is now estimated to be much smaller, and much less persistent than the impulse responses suggested by Figure 9. A 4 percent positive shock to the innovation of the nominal effective exchange rate tends to raise price inflation initially, with the peak (at 0.8 percent above baseline), occurring two quarters after the shock. Thereafter, however, the impact of the exchange rate depreciation on inflation starts to fall sharply, and inflation returns to its baseline path some two years following the shock. Thus, including the earlier period provides a much more benign picture of the impact of exchange rate changes on inflation.

86. Inspection of the rest of Figure 10 makes the source of the difference rather clear: the very different response of price inflation mirrors the very different response of wage growth to the exchange rate. Thus, in contrast to the results of Figure 9, the 4 percent positive shock to the innovation of the exchange rate is now estimated to entail a sharp reduction in nominal wage growth: wage growth falls by over 1 percent below baseline within three quarters following the shock, and remains below its baseline path for a period of over two years. This pattern clearly reflects to a large extent the impact of the incomes policies in place at the time, and in particular the measures adopted following the 1985 drachma devaluation. It is also noteworthy that, again in contrast to the results of Figure 9, the results based on the earlier

Figure 10. Greece: Impulse-Response Functions for a Devaluation Shock in the VAR Estimated on 1981-97



Sources: Greek authorities and staff estimates.

sample now suggest a contractionary impact of an exchange rate depreciation. The 4 percent positive shock to the innovation of the exchange rate is estimated to entail a fall in the output gap, which reaches a trough at 0.2 percentage points below its baseline path some two years after the shock. This pattern would suggest that the impact of the real wage decline on domestic demand would tend to outweigh the devaluation's positive impact on competitiveness and on the supply side of the economy.

87. The results of Figure 10 suggest that, despite their potentially unappealing features in terms of labor market flexibility and wage differentiation, incomes policies can be a powerful tool to limit the impact of exchange rate depreciation on inflation. The policy-relevant question in the current context, when formal incomes policies in the private sector are not part of the authorities' policy arsenal, is what type of policy could supplant them to attain a similarly benign impact of exchange rate changes on inflation. With fiscal policy being an obvious candidate, the question is what do the results of the VAR system tell us about the amount of the necessary fiscal tightening in order to, in a sense, "replicate" the outcome under incomes policies.

88. Going back to Figure 9, and assuming that the impact of the fiscal tightening on inflation works through its impact on aggregate demand, the question boils down to determining by how much output has to fall relative to potential, so that price inflation returns to its baseline path within a period of 10 quarters.[47] In turn, this would imply a fall in inflation by just under 4 percent over the time horizon considered. On the basis of the information included in the impulse response functions, such a reduction would require a fall in the gap variable by 1.9 percent. Assuming an expenditure multiplier close to one, as in Section C, the needed adjustment (on the expenditure side) would be of the order of 1.9 percent of GDP.[48] The lag structure reflected in the impulse response functions would point to a need to front-load the adjustment in 1998–1999.

---

[47]A more direct option would be to include a fiscal variable as an additional variable of the VAR system. However, lack of reliable, high-frequency data that adequately capture the fiscal stance precludes this route.

[48]It may be noted that this estimate is appreciably larger than the size of needed fiscal consolidation calculated in Section C. This difference should not be viewed as implying that the models underlying the two sections are mutually incompatible; rather, it is mainly a reflection of differences in envisaged path of nominal wages. While calculations based on Figure 9 essentially impose a path that reflects wage setting behavior over the estimation period, Section C had adopted a more moderate wage growth assumption for the forecast period, thus resulting in a lesser need for fiscal adjustment.

E. The Drachma Devaluation in a European Context: A Cross-Country Comparison

89. This chapter has employed a variety of empirical methodologies to gain some insight into the impact of a change in the drachma's exchange rate on inflation. The results coincided in highlighting the difficulty of attaining the official inflation target for end-1999 and early 2000 without additional policy adjustment. Specifically, the results suggest that exchange rate changes have tended to entail a strong, and persistent, impact on prices. In turn, this pattern appears to reflect, in large part, a wage setting process characterized by extensive real wage rigidity.

90. A question could, however, be raised as to the relevance of such past behavioral patterns for the purpose of making predictions in Greece's current context. After all, ERM entry constitutes a fundamental policy "regime" shift, and hence inferences based on past behavior would appear to be sensitive to the Lucas (1974) critique. Indeed, following ERM entry, market indicators (including interest rate differentials and implied forward interest rates) point to strengthened credibility of the drachma's central parity, itself hinging crucially on Greece's prospects of EMU participation.[49]

91. The recent experience of a number of European countries that underwent major policy regime shifts would appear to lend support to these considerations. In particular, countries that experienced pronounced depreciations of their exchange rates at the time of the ERM crisis of 1992-93 were nonetheless eminently successful in their disinflation efforts, in apparent contrast to past patterns regarding the pass-through of exchange rate changes to prices. At the same time, concrete policy responses and the overall macroeconomic environment undoubtedly contributed to this benign outcome. A brief benchmarking of Greece against these countries could therefore provide a qualitative indication of the chances of replicating their success in disinflation.

92. The cases of Italy, Portugal, Spain, Sweden, the United Kingdom (and, to a lesser extent, Ireland) may be viewed as examples of countries that have in recent years experienced relatively large exchange rate depreciations but have nevertheless managed to reduce inflation to generally moderate levels. On average, these countries reduced their inflation rate from levels close to or above 5 percent in 1992 to 2 percent in 1997, while their effective exchange rates depreciated sharply in late 1992 and in 1993 (and, in some cases, notably Italy, also subsequently); see table below.

---

[49]For the case of Spain, Sobczak (1998) provides evidence that the decline in inflation after 1995 constitutes a break relative to past behavior, inter alia resulting from credibility gains associated with a strong commitment to early EMU participation.

Selected Indicators in Countries Experiencing Strong Depreciation
Average Values for Ireland, Italy, Portugal, Spain, Sweden, and the United Kingdom

(Growth rate unless otherwise indicated)

	1991	1992	1993	1994	1995	1996	1997
Inflation	7.2	5.0	4.1	3.5	3.7	2.7	1.9
Effective exchange rate (- : depreciation)	-0.1	0.1	-10.9	-2.2	-1.7	4.3	1.5
Output gap (percent of GDP)	1.1	-0.7	-3.5	-3.0	-1.8	-1.9	-1.6
Total domestic demand	0.6	0.8	-2.4	2.7	3.1	2.6	3.5
Exports of goods & services	2.4	6.7	6.9	13.1	13.2	6.8	10.0
Primary structural balance (percent of GDP)	0.7	1.3	1.4	1.8	2.0	3.5	5.1
Unit labor cost (business sector)	8.4	3.8	2.8	0.5	0.8	2.4	1.8
Labor productivity	0.9	3.0	2.4	3.2	2.7	1.5	2.2
Total employment	-0.2	-2.2	-2.5	0.1	1.5	1.4	1.4
Capital income share in the business sector (In percent)	31.9	32.4	33.9	35.2	36.7	35.9	35.5

Source: WEO, OECD, and Fund staff calculations.

93. A variety of factors helped to contain inflationary pressures in these countries despite the exchange rate depreciation; this section does not intend to be exhaustive of what has been a rather varied cross-country experience. Nonetheless, a broad survey of this experience highlights three main components: subdued activity, strong fiscal adjustment, and a moderation in unit labor costs in the aftermath of the devaluation (mainly as a result of high productivity gains and wage bargaining reforms). In addition, disinflation tended to be rather gradual in the countries under review, being spread over a number of years.

The output gap and the composition of growth in the recovery

94. At the time of the exchange rate depreciations of 1992–93, all of the countries under review were in the midst of one of the deepest recessions of the postwar period. Output gaps worsened rapidly from generally positive values at the beginning of the decade to fairly marked negative values by 1993. The average output gap for the group of countries deteriorated by some 4½ percent of GDP between 1991 and 1993. In the case of Italy, for example, Ford and Krueger (1995) show that the recession offset the inflationary impact of the devaluation as inflation remained contained while import prices increased strongly.

95. Significantly, the recession was driven by a marked decline in total domestic demand, particularly private consumption: in contrast to earlier recessions, the cyclical downturn was

not caused by a shock to the supply side of the economy. The fall in domestic demand served to alleviate inflationary pressures. Moreover, as could be expected after an exchange rate depreciation, the recovery was initially driven by the dynamism of net exports (with double-digit growth rates) rather than by domestic demand. This composition of growth was the result of ongoing fiscal adjustment and declining total employment.

Fiscal adjustment

96. The exchange rate depreciation was also followed by a strong adjustment in public finances. Countries committed to participation in EMU from the start needed to reduce their deficit rapidly and, in some cases, considerably to comply with the Maastricht criterion. As a result, the fiscal impulse was highly restrictive from 1993 to 1997, with an average withdrawal of fiscal stimulus of 3¾ percentage points of GDP between 1993 and 1997.

Moderate unit labor costs due to strong productivity gains and incomes policies

97. On average, unit labor costs in the business sector decelerated sharply after the devaluation, from a growth rate of almost 8½ percent in 1991, to one of only ½ percent in 1994 and 0.8 percent in 1995. Extensive labor shedding in the midst of the recession bolstered productivity gains: employment declined sharply in 1992 and 1993, and recovered only very gradually after 1994.

98. At the same time, wage bargaining reforms were introduced in several countries to reduce real wage rigidity and shift wage formation away from indexation arrangements to forward-looking incomes policy agreements. For example, in Italy, following the abolition of the *scala mobile* system of automatic wage indexing, the July 1993 wage bargaining agreement provided for wage increases based on the official inflation target.[50] In Ireland, the wage agreement for 1994–96 imposed a ceiling on annual wage increases based on the expected price rise; in addition, "Local Bargaining Clauses," which allowed employers to negotiate productivity increases in exchange for pay in previous agreements, were suspended. In Spain, the 1994 labor market reform instructed the social partners to replace the remaining rigid Labor Ordinances with collective agreements. As a result also of these changes, capital income shares in the business sector increased notably during the period, from 32 percent in 1991 to some 36–37 percent in 1995–97, alleviating pressures on price formation.

A gradual pace of disinflation

99. In the countries under review, it took almost five years for inflation to decline from 5 percent (in 1992) to below 2 percent in (1997). Notably, in the first three years following the exchange rate depreciations, average inflation remained above 3½ percent. Disinflation

---

[50]Fabiani et. al. (1988) conclude that, in the absence of the July 1993 framework, inflation would have been 2–3 percentage points higher.

thus set in only rather gradually, especially in Italy, Portugal and Spain. The output gap remained significantly negative throughout the disinflation period.

The situation in Greece

100. The current and prospective situation in Greece contrasts in several respects with the experience of the countries reviewed above.

- While estimates of the output gap differ,[51] the cyclical situation in Greece is clearly one of a gathering recovery, in contrast to the economic recession that characterized the post-depreciation situation of the other countries. Moreover, the main engine of Greece's growth since 1995 has been domestic demand, and the external contribution is not expected to be significant in the medium term.

- The fiscal stance is not set to be restrictive after 1998. In the new medium-term convergence program submitted in June, the primary structural balance is to remain unchanged at between 6.7–6.9 percent of GDP from 1998 to 2001, at a time when output growth is above potential.

- Unit labor costs are projected to grow by 3¾ percent in 1998 and 2½ percent in 1999, in contrast to the significantly more subdued increases observed in other countries in the aftermath of their exchange rate depreciations. There is no formal incomes policy framework in place that is designed to prevent the devaluation from feeding into private sector wages; on the contrary, explicit catch-up clauses will imply second-round effects.

- Finally, the time span between the devaluation and the Maastricht reference period is comparatively much more compressed: the planned reduction in inflation (from 5½ percent in 1997 to 2½ percent by end-1999) is to occur over a two-year period; as seen, disinflation of a similar magnitude took almost five years in the other countries reviewed.

F. Concluding Remarks

101. This chapter has attempted to assess the post-devaluation prospects for inflation in Greece. This question is of considerable interest, especially given the rather short time frame ahead of the target date for EMU participation, with inflation likely to constitute the most challenging hurdle in terms of meeting the Maastricht criteria. In addressing this question, a number of alternative empirical approaches were pursued, in order to assess the sensitivity of the results to different specifications and also to gain an understanding of some of the underlying factors behind the pass-through of exchange rate changes to prices.

---

[51] As seen in Chapter I, staff estimates suggest that the gap in Greece is largely closed.

102. The empirical results suggest, in a sufficiently robust way, that even transitory exchange rate shocks have tended to entail a strong and persistent impact on inflation in the case of Greece. An important factor that seems to underlie this pattern relates to wage setting behavior. The empirical tests employed in this chapter provide evidence of considerable real wage rigidity, with a tendency on the part of wage setters to target the level of the real wage and correct for past real wage surprises. Moreover, the results point to appreciable hysteresis as regards the impact of shifts in aggregate demand on price inflation. These features would imply that the impact of exchange rate changes on inflation, rather than being restricted to a direct first-round effect on import (or tradable goods) prices, can be quite protracted and spill over to the rest of the economy.

103. Post-devaluation wage arrangements and likely developments do not signal a strong enough break with the past to change this pattern. Model simulations performed in this chapter suggest that the recent national wage agreement, even under rather positive assumptions regarding lower-tier wage outcomes, could entail a wage-price dynamic that would put the Maastricht inflation target at risk. In this regard, the catch-up clauses embodied in the agreement could prove particularly detrimental.

104. The recent experience of other European countries that were successful in achieving disinflation despite large devaluations of their exchange rates also provides grounds for caution in assuming a similar outcome in Greece. Recent empirical work on these countries has tended to point to a set of circumstances that were in large part responsible for their success: these include a substantial degree of economic slack, and fundamental changes in the wage setting system, reinforced by sharp fiscal retrenchment. With these factors largely absent in the case of Greece, the task of disinflation appears consequently more demanding. Nonetheless, Greece's participation in the ERM, as well as the strong commitment to EMU, should help dampen inflation expectations to European levels. But the ERM experience of other European countries, as well as the recent experience of the "hard drachma" policy, indicate that an exchange rate commitment will not in itself suffice to achieve disinflation, and will need to be supported by wage developments that help reduce pressures on prices and a fiscal policy that acts to dampen domestic demand.

105. These considerations point to the need of policy adjustment to place inflation on a firm downward path. With changes in the wage bargaining system not currently an option, the role of fiscal policy (which also featured prominently in the success of the countries referred to above) would appear crucial. On the basis of the empirical framework employed in this chapter, it is concluded that front-loaded, expenditure-based fiscal consolidation of at least 1 percentage point of GDP may be needed to secure the Maastricht reference value within the time frame required for EMU participation by January 1, 2001.

References

Bean, C., 1994, "European Unemployment: A Survey," *Journal of Economic Literature*, Vol. 32, pp. 573–619.

Christofides, C., 1995, "An Index of Coincident Economic Indicators for Greece," in *Greece—Background Paper*, IMF Staff Country Report No. 95/95 (Washington: International Monetary Fund).

Fabiani, S., A. Locarno, G. Oneto, and P. Sestito, 1998, "Risultati e Problemi di un Quinquennio di Politica dei Redditi: Una Prima Valutazione Quantitativa," Banca d'Italia, Temi di Discussione No. 329.

Ford, R. and T. Krueger, 1995, "Exchange Rate Movements and Inflation Performance: The Case of Italy," IMF Working Paper 95/41, (Washington: International Monetary Fund).

Hall, S. G. and N. G. Zonzilos, 1996, "The Output Gap and Inflation in Greece," mimeo, Bank of Greece.

Karadeloglou, P., C. Papazoglou, and G. Zombanakis, 1997, "Is the Exchange Rate an Effective Anti-Inflationary Policy Instrument?," mimeo, Bank of Greece.

Layard, R., S. Nickell, and R. Jackman, 1991, *Unemployment* (Oxford University Press).

Litterman, R. and L. Weiss, 1985, "Money, Real Interest Rates, and Output: A Reinterpretation of Postwar U.S. Data," *Econometrica*, 53.

Lucas, R. E., Jr., 1976, "Econometric Policy Evaluation: A Critique," in *The Phillips Curve and Labor Markets*, ed. by K. Brunner and A. H. Metzler (New York: North-Holland).

Obstfeld, M., 1997, "Europe's Gamble," *Brookings Papers on Economic Activity*, 2.

OECD, 1997, "Recent Labor Market Developments and Prospects," Chapter I, *Employment Outlook*.

Oxford Economic Forecasting, 1995, "New Oxford World Model," Oxford.

Sims, C. A., 1980, "Macroeconomics and Reality," *Econometrica*, 48.

———, 1982, "Policy Analysis with Econometric Models," *Brookings Papers on Economic Activity*.

Sobczak, N. , 1998, "Disinflation in Spain: the Recent Experience," in *Spain—Selected Issues*, IMF Staff Country Report No. 98/53 (Washington: International Monetary Fund).

Table 4. Greece: Aggregate Demand

(At constant prices of the previous year)

	1992	1993	1994	1995	1996	1997 Prel.
			(Percentage changes)			
Gross domestic product at market prices	0.7	-1.6	2.0	2.1	2.7	3.5
Consumption	1.5	-0.3	1.6	3.1	2.0	2.1
Private	2.4	-0.8	2.1	2.2	2.3	2.5
Government	-3.0	2.6	-1.1	8.0	0.5	-0.1
Gross fixed capital formation	-3.2	-3.5	-2.8	7.3	9.4	10.9
Private	-6.3	-5.0	-2.3	6.0	9.0	8.3
Public	8.2	1.1	-4.2	11.0	10.3	18.2
Construction	-8.3	-6.0	-3.4	2.0	6.4	10.9
Equipment	6.7	0.6	1.8	16.0	13.8	12.4
Change in stocks (in percent of GDP)	-0.3	-0.3	0.1	-0.6	-0.2	0.5
Total domestic demand	-0.6	-0.9	1.2	3.2	3.3	3.8
Foreign balance (in percent of GDP)	-9.5	-10.3	-8.7	-8.8	-9.1	-8.7
Exports of goods and NFS	10.4	-3.3	6.5	1.0	0.2	5.2
Imports of goods and NFS	1.3	0.2	1.3	6.1	3.9	5.9
			(Contributions to growth)			
Gross domestic product at market prices	0.7	-1.6	2.0	2.1	2.7	3.5
Consumption	1.3	-0.2	1.4	2.8	1.8	1.8
Private	1.8	-0.6	1.6	1.7	1.7	1.9
Government	-0.4	0.4	-0.2	1.1	0.1	0.0
Gross fixed capital formation	-0.7	-0.7	-0.6	1.4	1.8	2.1
Private	-1.1	-0.8	-0.3	0.8	1.3	1.2
Public	0.4	0.1	-0.2	0.5	0.5	0.9
Total domestic demand	-0.7	-1.0	1.3	3.4	3.6	4.2
Foreign balance	1.4	-0.6	0.7	-1.3	-0.9	-0.6
Exports of goods and NFS	1.7	-0.6	1.0	0.2	0.0	0.8
Imports of goods and NFS	-0.4	-0.1	-0.3	-1.5	-0.9	-1.4

Sources: Ministry of National Economy; and Fund staff calculations.

Table 5. Greece: Aggregate Demand

	1992	1993	1994	1995	1996	1997 Prel.
	(In billions of drachmas; at current prices)					
Gross domestic product at market prices	18,766.1	21,135.7	23,984.0	26,895.1	29,861.0	33,026.0
Consumption	16,647.4	18,963.4	21,346.4	24,160.7	26,451.5	28,836.3
Private	14,033.5	15,900.1	18,012.1	19,995.6	22,194.5	24,000.0
Government	2,613.9	3,063.3	3,334.3	4,165.1	4,257.0	4,836.3
Gross domestic investment	3,923.4	4,192.4	4,490.8	5,008.6	5,918.6	6,833.6
Gross fixed capital formation	3,983.8	4,267.1	4,453.4	5,074.1	5,810.0	6,740.6
Private	3,033.2	3,186.8	3,335.5	3,748.0	4,268.0	4,829.1
Public	950.6	1,080.3	1,117.9	1,326.1	1,542.0	1,911.5
Change in stocks	-60.4	-74.7	37.4	-65.5	108.6	93.0
Total domestic demand	20,570.8	23,155.8	25,837.2	29,169.3	32,370.1	35,669.9
Foreign balance	-1,804.7	-2,020.1	-1,853.2	-2,274.2	-2,509.1	-2,643.9
Exports of goods and NFS	3,174.5	3,355.5	3,904.0	4,242.7	4,527.0	5,005.9
Imports of goods and NFS	4,979.2	5,375.6	5,757.2	6,516.9	7,036.1	7,649.8
Net factor income from abroad	249.8	137.8	207.8	172.1	73.4	70.0
GNP at market prices	19,015.9	21,273.5	24,191.8	27,067.2	29,934.4	33,096.0
Depreciation	1,640.0	1,847.7	1,944.8	2,206.5	2,526.9	2,840.2
NNP at market prices	17,375.9	19,425.8	22,247.0	24,860.7	27,407.5	30,255.8
Indirect taxes less subsidies	2,229.8	2,310.1	2,576.1	2,937.6	3,174.9	3,671.6
NNP at factor cost	15,146.1	17,115.7	19,670.9	21,923.1	24,232.6	26,584.2
			(In percent of GDP)			
Consumption	88.7	89.7	89.0	89.8	88.6	87.3
Private	74.8	75.2	75.1	74.3	74.3	72.7
Gross fixed capital formation	21.2	20.2	18.6	18.9	19.5	20.4
Private	16.2	15.1	13.9	13.9	14.3	14.6
Foreign balance	-9.6	-9.6	-7.7	-8.5	-8.4	-8.0
Exports of goods and NFS	16.9	15.9	16.3	15.8	15.2	15.2
Imports of goods and NFS	26.5	25.4	24.0	24.2	23.6	23.2

Source: Ministry of National Economy.

Table 6. Greece: Private Sector Income Account 1/

(In billions of drachmas; at current prices; percentage changes in parentheses)

	1992	1993	1994	1995	1996	1997 Prel.
Compensation of employees	6,024.2	6,763.4	7,708.3	8,864.5	10,078.9	11,217.9
	(12.2)	(12.3)	(14.0)	(15.0)	(13.7)	(11.3)
Nonlabor income, net	10,841.3	12,397.7	14,451.9	15,398.2	16,431.9	17,059.6
	(20.3)	(14.4)	(16.6)	(6.5)	(6.7)	(3.8)
Current transfers received	3,514.9	4,020.2	4,544.9	5,241.1	5,744.2	6,276.7
	(15.6)	(14.4)	(13.1)	(15.3)	(9.6)	(9.3)
Direct taxes	1,025.4	1,218.4	1,643.6	1,972.8	2,137.1	2,497.7
	(13.5)	(18.8)	(34.9)	(20.0)	(8.3)	(16.9)
Current transfers paid	2,085.1	2,557.3	2,948.7	3,368.7	3,758.3	4,110.5
	(14.4)	(22.6)	(15.3)	(14.2)	(11.6)	(9.4)
Disposable income	17,269.9	19,405.6	22,112.8	24,162.3	26,359.6	27,946.0
	(17.5)	(12.4)	(14.0)	(9.3)	(9.1)	(6.0)
Private consumption	14,033.5	15,900.1	18,012.1	19,995.6	22,194.5	24,000.0
Private saving	3,236.4	3,505.5	4,100.7	4,166.7	4,165.1	3,946.0
Private saving rate	18.7	18.1	18.5	17.2	15.8	14.1

Source: Ministry of National Economy.

1/ Including public enterprises.

Table 7. Greece: Saving-Investment Balance

	1992	1993	1994	1995	1996	1997 Prel.
	(In billions of drachmas; at current prices)					
Gross domestic investment	3,923.4	4,192.4	4,490.8	5,008.6	5,918.6	6,833.6
Gross fixed capital formation	3,983.8	4,267.1	4,453.4	5,074.1	5,810.0	6,740.6
Change in stocks	-60.4	-74.7	37.4	-65.5	108.6	93.0
Total saving	3,923.4	4,192.4	4,490.8	5,008.6	5,918.6	6,833.6
Gross private saving	3,236.4	3,505.5	4,100.7	4,166.7	4,165.1	3,946.0
Net government saving 1/	-1,329.7	-1,701.0	-1,733.1	-1,921.1	-1,547.5	-751.2
Depreciation	1,640.0	1,847.7	1,944.8	2,206.5	2,526.9	2,840.2
Foreign saving 2/	376.7	540.2	178.4	556.5	774.1	798.6
	(In percent of GDP)					
Gross domestic investment	20.9	19.8	18.7	18.6	19.8	20.7
Gross fixed capital formation	21.2	20.2	18.6	18.9	19.5	20.4
Change in stocks	-0.3	-0.4	0.2	-0.2	0.4	0.3
Total saving	20.9	19.8	18.7	18.6	19.8	20.7
Gross private saving	17.2	16.6	17.1	15.5	13.9	11.9
Net government saving	-7.1	-8.0	-7.2	-7.1	-5.2	-2.3
Depreciation	8.7	8.7	8.1	8.2	8.5	8.6
Foreign saving	2.0	2.6	0.7	2.1	2.6	2.4
Memorandum items:						
Government current revenue 1/	6,327.3	7,396.4	8,746.1	10,085.1	11,214.7	12,612.6
(in percent of GDP)	33.7	35.0	36.5	37.5	37.6	38.2
Government current expenditure 1/	7,657.0	9,097.4	10,479.2	12,006.2	12,762.2	13,363.8
(in percent of GDP	40.8	43.0	43.7	44.6	42.7	40.5
Gross national saving	3,796.5	3,790.0	4,520.2	4,624.2	5,217.9	6,105.0
(in percent of GDP)	20.2	17.9	18.8	17.2	17.5	18.5

Sources: Ministry of National Economy; and Fund staff calculations.

1/ On a national accounts basis; government statistics refer to the general government.
2/ Current account deficit.

Table 8. Greece: Agricultural Production

(In thousands of tons)

	1992	1993	1994	1995	1996	1997 Prov.
Soft wheat	879.0	819.0	838.0	758.0	630.0	606.0
Hard wheat	1,423.0	1,192.0	1,581.0	1,384.0	1,132.0	1,398.0
Maize	1,976.0	1,936.0	1,814.0	1,520.0	1,800.0	1,910.0
Alfalfa	1,479.0	1,489.0	1,428.0	1,396.0	1,266.0	1,265.0
Leaf tobacco 1/	187.0	136.0	129.0	120.0	126.0	121.0
Cotton (industrial)	818.0	986.0	1,180.0	1,250.0	962.0	1,100.0
Tomatoes for processing	966.0	950.0	1,100.0	1,130.0	1,162.0	1,219.0
Sugar beet	3,059.0	2,718.0	2,420.0	2,600.0	2,352.0	3,025.0
Olive oil	303.0	268.0	330.0	330.0	337.0	400.0
Lemons	176.0	137.0	141.0	140.0	161.0	152.0
Oranges	987.0	897.0	875.0	820.0	979.0	960.0
Apples	385.0	331.0	321.0	323.0	335.0	297.0
Peaches	1,122.0	1,083.0	1,173.0	745.0	897.0	300.0
Meat, total	545.0	528.0	522.0	510.0	525.0	522.0
Milk, total	1,803.0	1,828.0	1,853.0	1,834.0	1,786.0	1,864.0

Sources: Ministry of National Economy; and National Statistical Service of Greece.

1/ Oriental, burley, and Virginia varieties.

Table 9. Greece: Manufacturing Production

(Percentage changes)

	Weight in Index (1980)	1992	1993	1994	1995	1996	1997
Total	100.0	-1.3	-3.2	1.1	2.1	0.6	1.0
Consumer goods	60.5	-2.1	-1.6	2.5	0.5	0.7	-0.6
Consumer durable goods	5.5	0.6	8.5	-0.2	-1.5	2.4	6.7
Capital goods	34.0	-0.1	-8.2	-1.5	6.5	0.1	4.3
Foodstuffs	11.9	7.8	-1.1	-1.1	2.0	-0.1	..
Beverages	3.7	4.2	3.0	7.8	3.9	-6.0	...
Tobacco	2.3	-4.9	-1.1	15.7	10.9	-1.2	...
Textiles	16.1	-8.5	-6.5	-0.5	-5.4	-4.6	...
Clothing and footwear	6.1	-4.3	3.2	-11.8	-9.8	-11.9	..
Wood and cork	2.2	-3.1	-8.2	-9.0	17.0	-2.0	...
Furniture	1.2	-2.9	-0.9	2.4	-4.7	-1.0	...
Paper	1.9	2.1	-7.0	6.9	3.7	-5.1	...
Printing and publishing	2.6	-2.9	-5.6	-2.4	-0.7	8.5	...
Leather products	0.8	2.7	-5.6	-4.3	-8.3	-7.0	...
Rubber and plastics	3.9	-10.3	3.7	9.4	-12.6	1.1	...
Chemicals	7.8	-3.7	4.0	2.0	10.8	7.9	...
Petroleum and coal production	2.8	14.3	-9.4	12.3	4.3	6.9	...
Nonmetallic minerals	8.6	-4.2	0.3	3.0	1.8	7.1	...
Basic metallurgy	6.5	2.0	-5.0	4.9	4.8	-3.7	...
Manufactured metal goods	6.4	1.3	-8.2	-2.1	4.6	-1.4	...
Nonelectrical machinery and appliances	1.9	-0.6	-10.8	1.1	20.5	2.9	...
Electrical machinery and appliances	4.7	1.7	9.1	-1.5	3.0	6.7	...
Transport equipment	8.0	-0.3	-20.4	-8.7	4.6	-1.3	...
Other	0.6	-53.5	-36.5	-11.1	14.2	79.7	...
Memorandum item:							
Capacity utilization in manufacturing 1/	n.a.	77.9	74.9	74.9	76.6	75.6	74.4

Sources: National Statistical Service of Greece, *Monthly Statistical Bulletin*; Ministry of National Economy; and IOBE.

1/ Estimate by IOBE.

Table 10. Greece: Price Developments

(Average percentage changes over preceding period, except as indicated)

	Weights 1/		1992	1993	1994	1995	1996	1997
Wholesale prices	100	n.a.	11.3	11.9	8.7	7.8	6.1	3.6
Final products for home consumption	82	n.a.	12.2	12.0	8.7	7.4	6.2	3.5/fs
Domestic industrial products	54	n.a.	14.7	13.5	7.4	8.1	7.1	4.8
Domestic primary products	12	n.a.	1.7	5.4	13.6	5.1	8.9	-0.2
Imported final products	15	n.a.	12.6	12.2	9.2	7.0	1.6	1.8
Exported products	18	n.a.	6.4	11.3	8.7	10.2	5.6	4.6
Consumer prices	100	100	15.9	14.4	10.9	8.9	8.2	5.5
Food and nonalcoholic beverages	33	21	11.8	10.5	13.7	8.4	7.0	4.1
Housing	11	14	17.3	15.8	10.5	9.6	9.2	2.8
Clothing and footwear	14	11	14.0	11.0	10.1	9.5	9.3	6.9
Durable goods and household supplies	8	8	12.3	8.8	8.9	8.9	6.6	6.2
Transport and communication	14	15	20.3	18.8	5.6	5.3	6.1	5.2
Other goods and services 2/	20	31	18.1	17.4	12.5	10.5	9.5	7.1
GDP deflator, at market prices	n.a.	n.a.	14.8	14.5	11.3	9.8	8.1	6.9
Import prices 3/	n.a.	n.a.	12.1	7.7	5.7	6.7	3.9	2.7
Private consumption deflator	n.a.	n.a.	15.6	14.2	11.0	8.6	8.5	5.5
Memorandum items:								
End-year increase								
Wholesale prices	n.a.	n.a.	12.8	9.1	10.2	6.7	3.9	3.1
Consumer prices	n.a.	n.a.	14.4	12.1	10.8	7.9	7.3	4.7

Source: Bank of Greece, *Monthly Statistical Bulletin*, and *Bulletin of Conjunctural Indicators*.

1/ Weights are based on 1980 for the wholesale price index and 1988 for the consumer price index prior to 1995, and based on 1994 for data for 1995–97.

2/ This category includes alcoholic beverages, tobacco, health and personal care, and education and recreation, along with other goods and services.

3/ Implicit import deflator for goods and services.

Table 11. Greece: Implicit Price Deflators

(Percentage changes)

	1992	1993	1994	1995	1996	1997 Prel.
Gross domestic product (at market prices)	14.8	14.5	11.3	9.8	8.1	6.9
Consumption	15.6	14.2	10.8	9.8	7.3	6.8
Private	15.6	14.2	11.0	8.6	8.5	5.5
Government	15.3	14.2	10.1	15.7	1.7	13.8
Gross fixed capital formation	12.7	11.0	7.4	6.2	4.7	4.6
Private	12.8	10.5	7.1	6.0	4.4	4.5
Public	12.4	12.4	8.1	6.8	5.4	4.9
Exports of goods and nonfactor services	9.7	9.3	9.2	7.6	6.5	5.1
Imports of goods and nonfactor services	12.1	7.7	5.7	6.7	3.9	2.7
Terms of trade	-2.1	1.5	3.3	0.8	2.5	2.3

Source: Ministry of National Economy.

Table 12. Greece: Cost-Push Indicators of Inflation

(Percentage changes)

	1992	1993	1994	1995	1996	1997
Unit labor costs	12.9	12.7	12.1	11.6	10.0	6.5
Gross operating surplus 1/	15.8	16.6	11.3	7.9	7.1	5.5
Net indirect taxes 1/	22.1	5.3	9.3	11.7	5.2	11.7
Import prices	12.1	7.7	5.6	6.7	3.9	2.7
Deflator of total expenditure	14.8	12.9	10.3	9.0	7.1	5.8
Contributions to changes in the deflator of total expenditure						
Unit labor costs	3.3	3.2	3.1	3.1	2.7	1.8
Gross operating surplus 1/	7.2	7.6	5.3	3.6	3.2	2.5
Net indirect taxes 1/	1.8	0.4	0.7	1.0	0.4	1.0
Import prices	2.5	1.6	1.1	1.3	0.7	0.5
Deflator of total expenditure	14.8	12.9	10.3	9.0	7.1	5.8
Memorandum items:						
Implicit GDP deflator	14.6	14.5	11.3	9.8	8.1	6.9
Implicit demand deflator	14.2	13.6	10.3	9.4	7.4	6.2

Source: Ministry of National Economy.

1/ Per unit of output.

Table 13. Greece: Labor Force, Employment, and Unemployment

(In thousands, unless otherwise noted)

	1992	1993	1994	1995	1996	1997
Labor force	4,034	4,118	4,193	4,248	4,318	4,294
In urban and semi-urban areas	2,978	3,073	3,151	3,218	3,277	3,277
In rural areas	1,057	1,045	1,043	1,031	1,041	1,018
Employment	3,684	3,720	3,790	3,824	3,872	3,854
By region:						
In urban and semi- urban areas	2,674	2,728	2,791	2,844	2,885	2,950
In rural areas	1,011	992	998	980	987	967
By gender:						
Female	1,281	1,301	1,337	1,372	1,402	1,415
Male	2,403	2,419	2,452	2,452	2,470	2,439
Unemployment	350	398	404	425	446	440
Female	212	234	233	249	279	367
Male	138	165	170	176	167	173
Youth (under 25 years)	146	162	155	157	168	162
Long-term	172	199	210	223	260	251
Unemployment rates 1/						
(In percent)						
Total 2/	8.7	9.7	9.6	10.0	10.3	10.3
Youth unemployment 2/	26.9	28.9	29.1	29.8	32.2	32.3
Registered unemployment 3/	7.6	7.1	7.2	7.1	7.5	7.9
Memorandum items:						
Labor force participation rate 4/	48.3	48.5	48.7	48.9	49.2	48.5
Male	63.5	63.6	63.7	63.6	63.3	62.1
Female	34.2	34.7	34.9	35.6	36.5	36.2

Source: National Statistical Service of Greece.

1/ Period average.
2/ Based on the annual labor force survey by the National Statistical Service of Greece.
3/ By the Labor Force Employment Organization (OAED).
4/ 14+ age group.

Table 14. Greece: Employment in Selected Sectors

(In thousands)

	1992	1993	1994	1995	1996	1997
Manufacturing	698.8	579.5 1/	577.8	577.7	576.1	559 2/
Construction	246.3	261.4	261.2	252.3	251.8	249.0 2/
Public sector enterprises and organizations	152.0	154.2	160.3	161.7	...	...
Banks	53.0	53.0	55.8	58.1	59.7	60.3
Government 3/	299.8	312.8	306.4	313.1	320.2	323.4

Sources: Ministry of National Economy; National Statistical Service of Greece; and Union of Banks.

1/ Seventy thousand persons employed in the repair of vehicles and home appliances have been reclassified into the service sector.

2/ End-June.

3/ Permanent and temporary employees of the central administration, and other budgetary organizations.

Table 15. Greece: Wages and Salaries in the Nonagricultural Sector

(Percentage changes over previous period)

	1992	1993	1994	1995	1996	1997 Est.
Nominal wages and salaries:						
All sectors						
Wage bill 1/	12.2	12.3	14.0	15.0	13.7	11.3
Average earnings 2/	11.8	12.5	13.0	11.9	11.5	10.7
Manufacturing 3/						
Wages (per hour)	13.7	10.5	13.1	13.2	8.6	9.4 4/
Salaries (per month)	14.6	13.1	13.0	13.2	9.4	10.5 4/
Retail trade salaries (per month)	16.4	12.0	13.3	12.8	9.7	11.2 4/
Civil service average earnings	11.7	13.2	9.4	12.3	14.9	13.5 4/
Business sector average earnings 5/	13.0	12.1	12.9	11.2	8.8	8.9 4/
Minimum wages and salaries						
Wages (per day)	11.3	12.0	12.6	9.4	7.8	8.0
Salaries (per month)	11.3	12.0	12.6	9.3	7.8	8.0
Memorandum items:						
Consumer prices (average)	15.8	14.4	10.9	8.9	8.2	5.5
Real wages and salaries						
All sectors						
Wage bill 1/	-3.1	-1.8	2.8	5.6	5.1	5.5
Average earnings	-3.5	-1.7	1.9	2.8	3.0	4.9

Sources: Bank of Greece; and National Statistical Service of Greece.

1/ National accounts basis (ESA).

2/ Bank of Greece estimates; differences in rates of change between wage bill and average earnings are due not only to changes in employment, but also to statistical discrepancies.

3/ Gross remuneration (including overtime) in establishments with ten or more employees.

4/ Preliminary estimates (Bank of Greece).

5/ All sectors excluding the civil service, public enterprises, and banking.

Table 16. Greece: Employment, Productivity, and Unit Labor Costs in Manufacturing

(Annual percentage changes)

	1992	1993	1994	1995	1996	1997
Production	-1.3	-3.2	1.1	2.1	0.6	1.0
Employment	-5.0	-5.9	-3.0	0.1	-0.6	-3.3
Hours worked per employee 2/	0.0	0.0	0.1	0.1	0.2	-0.2
Productivity 3/	3.9	2.9	3.9	2.0	1.1	4.6
Hourly wages	13.7	10.5	13.1	13.2	8.6	9.4
Unit labor costs	9.5	7.4	8.7	11.0	7.5	4.6
Including impact of social security contributions 4/	10.0	10.1	8.7	11.3	7.7	4.6

Sources: Bank of Greece; and National Statistical Service of Greece.

1/ Preliminary estimates.
2/ For wage earners.
3/ Production per man-hour.
4/ Estimate (Bank of Greece).

Table 17. Greece: Collective Labor Agreements, Compulsory Arbitration and Impact of Labor Disputes

	Number of collective agreements	Number of arbitration decisions	Number of man-hours lost to labor disputes (In millions)		
			Total	Private sector	Public enterprises and banks
1980	220	299	20.5	...	...
1981	233	330	5.3	...	...
1982	284	232	7.9	...	...
1983	57	80	3.0	...	...
1984	252	264	2.7	...	...
1985	175	167	7.7	5.5	2.2
1986	44	82	8.8	5.6	3.2
1987	76	84	16.4	10.8	5.5
1988	210	83	5.6	3.4	2.2
1989	276	111	8.9	5.5	3.4
1990	195	106	20.4	10.4	10.1
1991	287	87	5.8	3.8	2.1
1992	171	32 1/	7.1	2.7	4.3
1993	280	30	3.5	2.3	1.2
1994	287	37	1.9	1.0	0.8
1995	239	33	0.7	0.6	0.1
1996	385	43	1.6	1.3	0.3
1997	286	52	1.0	0.6	0.3

Sources: Bank of Greece; and Ministry of Labor.

1/ Starting in 1992, arbitration decisions are not issued by courts, but by the newly-established (under Law 1876/90) Organization for Medication and Arbitration.

Table 18. Greece: Summary of Central Government Finances 1/

	1992	1993	1994	1995	1996	1997 Budget	1997 Est.	1998 Budget
				(In billions of drachmas)				
Central government revenue	5,329	5,970	6,940	7,786	8,833	10,416	10,089	11,224
Tax revenue	4,116	4,545	5,235	5,968	6,616	7,804	7,590	8,508
Direct	1,192	1,355	1,773	2,133	2,316	2,790	2,762	3,111
Indirect	2,924	3,189	3,462	3,835	4,300	5,014	4,828	5,397
Nontax revenue	1,213	1,425	1,705	1,818	2,217	2,607	2,500	2,716
Investment budget	212	290	310	345	567	817	750	890
Of which: EU	183	272	288	322	548	700	700	840
SAGAP 2/	529	709	768	713	881	884	884	958
Other	472	426	627	760	768	911	866	868
Central government expenditure	6,629	8,295	9,827	10,555	11,454	12,775	12,170	13,387
Ordinary budget	5,374	6,857	8,251	8,880	9,747	10,225	10,086	10,424
Of which: Interest paid	1,559	2,334	3,340	3,356	3,501	3,468	3,216	3,220
Investment budget	726	728	807	962	827	1,661	1,200	2,005
SAGAP 2/	529	709	768	713	881	884	884	958
Central government primary expenditure	5,070	5,961	6,487	7,199	7,953	8,958	8,954	10,167
Of which: Current primary expenditure	4,344	5,233	5,680	6,237	7,127	7,641	7,754	8,162
Central government balance (budget presentation)	-1,300	-2,325	-2,887	-2,769	-2,622	-2,010	-1,973	-1,560
Of which: Central government primary balance	259	9	453	587	879	1,458	1,135	1,660
Capitalized interest	483	353	250	84	179	33	33	0
Central government balance (Fund presentation)	-1,783	-2,678	-3,137	-2,853	-2,801	-2,043	-2,114	-1,560
Of which: Central government primary balance	259	9	453	587	879	1,458	1,135	1,660
Memorandum item:								
GDP	18,766	21,136	23,934	26,590	29,595	32,723	32,723	35,672
				(In percent of GDP)				
Central government revenue	28.4	28.2	29.0	29.3	29.8	31.9	30.5	31.7
Tax revenue	21.9	21.5	21.9	22.4	22.4	23.9	23.0	24.0
Direct	6.4	6.4	7.4	8.0	7.8	8.5	8.4	8.8
Indirect	15.6	15.1	14.5	14.4	14.5	15.4	14.6	15.2
Nontax revenue	6.5	6.7	7.1	6.8	7.5	8.0	7.6	7.7
Investment budget	1.1	1.4	1.3	1.3	1.9	2.5	2.3	2.5
Of which: EU	1.0	1.3	1.2	1.2	1.9	2.1	2.1	2.4
SAGAP 2/	2.8	3.4	3.2	2.7	3.0	2.7	2.7	2.7
Other	2.5	2.0	2.6	2.9	2.6	2.8	2.6	2.4
Central government expenditure	35.3	39.2	41.1	39.7	38.7	39.1	36.8	37.8
Ordinary budget	28.6	32.4	34.5	33.4	32.9	31.3	30.5	29.4
Of which: Interest paid	8.3	11.0	14.0	12.6	11.8	10.6	9.7	9.1
Investment budget	3.9	3.4	3.4	3.6	2.8	5.1	3.6	5.7
SAGAP 2/	2.8	3.4	3.2	2.7	3.0	2.7	2.7	2.7
Central government primary expenditure	27.0	28.2	27.1	27.1	26.9	27.4	27.1	28.7
Of which: Current primary expenditure	23.1	24.8	23.7	23.5	24.1	23.4	23.5	23.0
Central government balance (budget presentation)	-6.9	-11.0	-12.1	-10.4	-8.9	-6.2	-6.0	-4.4
Of which: Central government primary balance	1.4	0.0	1.9	2.2	3.0	4.5	3.4	4.7
Capitalized interest	2.6	1.7	1.0	0.3	0.6	0.1	0.1	0.0
Central government balance 2/ (Fund presentation)	-9.5	-12.7	-13.1	-10.7	-9.5	-6.3	-6.4	-4.4
Of which: Central goverment primary balance	1.4	0.0	1.9	2.2	3.0	4.5	3.4	4.7

Sources: Ministry of Finance; and Bank of Greece.

1/ Data not directly comparable to those on a national accounts basis in Tables 22 and 23.

2/ Special Account for Guarantees of Agricultural Products.

Table 19. Greece: Ordinary Budget Revenue

(In billions of Drachmas)

	1992	1993	1994	1995	1996	1997		1998
						Budget	Prov.	Budget
Total Ordinary Budget revenue	4,587.9	4,971.0	5,861.8	6,727.8	7,384.1	8,715.0	8,455.0	9,376.0
Tax revenue	4,115.8	4,544.7	5,234.9	5,967.5	6,616.0	7,804.0	7,589.5	8,508.0
Direct taxes	1,192.3	1,355.4	1,773.4	2,132.7	2,316.1	2,790.0	2,761.7	3,111.0
Personal income tax	504.4	528.5	671.8	861.1	1,018.9	1,233.0	1,295.0	1,377.0
Corporate income tax	237.9	287.4	365.5	459.7	522.1	630.4	641.7	801.0
Property tax	58.6	70.2	76.5	80.0	78.9	127.0	124.0	139.5
Interest tax and other special income taxes	194.4	257.2	333.6	335.1	345.4	408.0	357.5	423.5
In favor of third parties	35.9	5.9	3.4	2.1	2.1	1.2	1.5	1.4
Other	161.1	206.2	322.7	394.7	348.6	390.3	342.0	368.6
Direct tax arrears	74.9	107.4	178.2	224.2	151.4	170.0	121.5	110.0
Extraordinary direct taxes (incl. on property)	40.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	45.4	98.8	144.5	170.5	197.2	220.3	220.5	258.6
Indirect taxes	2,923.5	3,189.3	3,461.5	3,834.9	4,299.9	5,014.0	4,827.8	5,397.0
Consumption taxes	1,070.9	1,213.1	1,310.9	1,460.0	1,637.0	1,907.0	1,766.5	1,932.6
On imports (non-EU after 1993)	154.4	82.1	72.8	43.5	44.9	49.0	68.4	75.6
Cars	114.9	35.7	28.1	18.6	25.3	29.4	35.7	42.7
Other imports	39.5	46.4	44.7	24.9	19.6	19.6	32.7	32.9
On domestic goods	916.5	1,131.0	1,238.0	1,416.5	1,592.1	1,858.0	1,698.1	1,857.1
Hydrocarbon fuels	572.2	674.0	688.0	739.4	820.8	940.0	822.4	865.2
Tobacco	199.5	239.8	333.6	371.8	405.4	465.0	458.0	512.0
Alcohol, etc.	20.3	35.2	39.7	43.3	59.0	75.0	75.0	83.0
Road duties	46.8	51.0	39.3	76.0	80.4	84.0	97.8	107.5
Other	77.7	131.0	137.3	186.0	226.5	294.0	244.9	289.4
Turnover tax (FKE)	23.1	23.9	27.3	31.6	39.3	45.0	40.0	50.0
Other	54.6	107.1	110.1	154.5	187.3	249.0	204.9	239.4
Transaction taxes	1,748.8	1,866.4	2,034.4	2,262.2	2,545.0	2,970.0	2,918.0	3,307.0
VAT	1,439.3	1,543.7	1,717.7	1,933.0	2,154.0	2,520.0	2,448.3	2,770.0
On imports (non-EU after 1993)	580.0	289.9	236.4	222.1	239.4	278.0	302.0	335.5
On domestic goods	859.3	1,253.8	1,481.3	1,710.9	1,914.6	2,242.0	2,146.3	2,434.0
Other	309.5	322.7	316.7	329.1	391.0	450.0	469.7	537.0
Capital transfers	79.2	82.6	93.7	93.7	107.2	118.0	158.0	156.0
Special banking transactions tax	89.7	80.0	47.5	41.2	49.2	57.0	47.8	49.0
Stamp duty	140.4	160.0	175.3	193.7	217.5	255.0	257.1	300.0
Other	0.2	0.1	0.2	0.6	17.1	20.0	6.8	32.0
Other indirect taxes	103.8	109.8	116.2	112.7	117.9	137.0	143.3	157.4
Indirect tax arrears	23.8	28.7	39.0	30.0	28.1	37.0	43.0	46.0
For EU	51.9	51.5	47.6	52.0	50.4	57.0	57.5	65.0
Other	28.1	29.6	29.6	30.7	39.4	43.5	42.8	46.4
Nontax revenue	472.1	426.3	626.9	760.2	768.1	911.0	865.5	868.0
Capital receipts	139.6	152.7	243.9	422.9	375.8	481.0		
Receipts from EU	84.6	104.8	141.7	86.0	88.1	67.4	44.5	
Other	247.9	168.8	241.2	251.3	335.2	362.6		

Source: Ministry of Finance.

Table 20. Greece: Ordinary Budget Revenue

(In percent of GDP)

	1992	1993	1994	1995	1996	1997		1998
						Budget	Prov.	Budget
Total ordinary budget revenue	24.4	23.5	24.4	25.0	24.7	26.7	25.6	26.4
Tax revenue	21.9	21.5	21.8	22.2	22.2	23.9	23.0	24.0
Direct taxes	6.4	6.4	7.4	7.9	7.8	8.5	8.4	8.8
Personal income tax	2.7	2.5	2.8	3.2	3.4	3.8	3.9	3.9
Corporate income tax	1.3	1.4	1.5	1.7	1.7	1.9	1.9	2.3
Property tax	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
Interest tax and other special income taxes	1.0	1.2	1.4	1.2	1.2	1.2	1.1	1.2
In favor of third parties	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.9	1.0	1.3	1.5	1.2	1.2	1.0	1.0
Direct tax arrears	0.4	0.5	0.7	0.8	0.5	0.5	0.4	0.3
Extraordinary direct taxes (incl. on property)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.2	0.5	0.6	0.6	0.7	0.7	0.7	0.7
Indirect taxes	15.6	15.1	14.4	14.3	14.4	15.3	14.6	15.2
Consumption taxes	5.7	5.7	5.5	5.4	5.5	5.8	5.3	5.4
On imports (non-EU after 1993)	0.8	0.4	0.3	0.2	0.2	0.1	0.2	0.2
Cars	0.6	0.4	0.3	0.2	0.2	0.1	0.2	0.1
Other imports	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1
On domestic goods	4.9	5.4	5.2	5.3	5.3	5.7	5.1	5.2
Hydrocarbon fuels	3.0	3.2	2.9	2.7	2.7	2.9	2.5	2.4
Tobacco	1.1	1.1	1.4	1.4	1.4	1.4	1.4	1.4
Alcohol, etc.	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Road duties	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Other	0.4	0.6	0.6	0.7	0.8	0.9	0.7	0.8
Turnover tax (FKE)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other	0.3	0.5	0.5	0.6	0.6	0.8	0.6	0.7
Transaction taxes	9.3	8.8	8.5	8.4	8.5	9.1	8.8	9.3
VAT	7.7	7.3	7.2	7.2	7.2	7.7	7.4	7.8
On imports (non-EU after 1993)	3.1	1.4	1.0	0.8	0.8	0.9	0.9	0.9
On domestic goods	4.6	5.9	6.2	6.4	6.4	6.9	6.5	6.9
Other	1.6	1.5	1.3	1.2	1.3	1.4	1.4	1.5
Capital transfers	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.4
Special banking transactions tax	0.5	0.4	0.2	0.2	0.2	0.2	0.1	0.1
Stamp duty	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.8
Other	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1
Other indirect taxes	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4
Indirect tax arrears	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
For EU	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nontax revenue	2.5	2.0	2.6	2.8	2.6	2.8	2.6	2.4

Source: Ministry of Finance.

Table 21. Greece: Ordinary Budget Expenditures

	1992	1993	1994	1995	1996	1997		1998
						Budget	Prov.	Budget
				(In billions of drachmas)				
Total Ordinary Budget expenditure (budget presentation)	5,374	6,857	8,251	8,880	9,747	10,225	10,086	10,424
Personnel outlays	1,858	2,039	2,319	2,614	2,974	3,377	3,519	3,652
Wages, salaries and allowances	1,339	1,434	1,600	1,819	2,218	2,494	2,621	2,724
Of which: allowances paid from off-budget account	...	...	...	50	74	...	...	...
Pensions	446	498	546	604	676	724	734	770
Medical care	73	107	123	141	161	160	164	158
Interest payments (budget presentation) 1/	1,559	2,334	3,340	3,356	3,501	3,468	3,216	3,220
Central government (incl. charges)	1,429	2,168	3,162	3,205	3,400	3,358	3,120	...
On military debt	130	166	177	151	101	110	110	...
Restitution of revenue to third parties	257	295	345	456	470	504	516	545
Payments to EU	198	273	309	312	355	397	438	438
Tax refunds	253	279	213	236	306	289	294	283
Rebates on export financing and interest subsidies	3	1	6	19	20	21	21	5
Agricultural subsidies	135	143	28	73	93	104	101	105
Grants	761	960	1,085	1,171	1,320	1,320	1,350	1,438
Social security funds	378	506	616	648	695	729	724	765
Transport	68	91	54	61	60	62	51	51
Other	315	362	415	462	565	529	575	621
Other	351	534	513	536	528	558	607	643
Guarantees	26	115	76	39	2	2	2	2
Other consumer expenditures	325	418	438	497	526	556	669	641
Reserve	0	0	0	0	0	276	0	50
Investment expenditures	0	0	144	158	179	34	93	0
				(In percent of GDP)				
Total Ordinary Budget expenditure (budget presentation)	28.6	32.4	34.4	33.0	32.6	31.3	30.5	29.4
Personnel outlays	9.9	9.6	9.7	9.7	10.0	10.3	10.7	10.3
Wages, salaries, and allowances	7.1	6.8	6.7	6.8	7.4	7.6	7.9	7.7
Pensions	2.4	2.4	2.3	2.2	2.3	2.2	2.2	2.2
Medical care	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4
Interest payments (budget presentation) 1/	8.3	11.0	13.9	12.5	11.7	10.6	9.7	9.1
Central government (incl. charges)	7.6	10.3	13.2	11.9	11.4	10.3	9.4	...
On military debt	0.7	0.8	0.7	0.6	0.3	0.3	0.3	...
Restitution of revenue to third parties	1.4	1.4	1.4	1.7	1.6	1.5	1.6	1.5
Payments to EU	1.1	1.3	1.3	1.2	1.2	1.2	1.3	1.2
Tax refunds	1.3	1.3	0.9	0.9	1.0	0.9	0.9	0.8
Rebates on export financing and interest subsidies	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0
Agricultural subsidies	0.7	0.7	0.1	0.3	0.3	0.3	0.3	0.3
Grants	4.1	4.5	4.5	4.4	4.4	4.0	4.1	4.1
Social security funds	2.0	2.7	2.9	2.8	2.7	2.2	2.2	2.2
Transport	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.1
Other	1.7	1.5	1.5	1.6	1.4	1.6	1.7	1.8
Other	1.9	2.5	2.1	2.0	1.8	1.7	1.8	1.8
Guarantees	0.1	0.5	0.3	0.1	0.0	0.0	0.0	0.0
Other consumer expenditures	1.7	2.0	1.8	1.8	1.8	1.7	2.0	1.8
Reserve	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.1
Investment expenditures	0.0	0.0	0.0	0.6	0.6	0.1	0.3	0.0
Memorandum items:								
Capitalized and accrued interest (in billions of drachma) 2/	483.0	353.0	250.0	84.0	179.0	33.0	33.0	0.0
Capitalized and accrued interest (in percent of GDP) 2/	2.6	1.7	1.0	0.3	0.6	0.1	0.1	0.0

Source: Ministry of Finance.

1/ Does not include capitalized and accrued interest.

2/ Bank of Greece data.

Table 22. Greece: Investment Budget Expenditure by Sector

(In billions of drachmas)

	1992	1993	1994	1995	1996	1997		1998
						Budget	Prov.	Budget
Public investment program								
Communications	0.0	0.0	0.0	0.5	0.0	6.9	6.5	8.5
Agriculture	8.7	11.1	8.5	7.0	11.9	88.4	75.8	88.6
Forestry, fishing	19.5	24.7	20.0	16.0	16.1	23.8	21.4	28.6
Land reclamation	49.7	58.4	47.2	32.0	26.9	42.2	47.0	50.4
Industry, energy, handicrafts	118.0	60.2	75.8	78.1	131.6	193.7	223.4	285.1
Transportation (excluding railways)	93.3	146.3	141.5	175.8	209.0	298.3	257.4	374.4
Railways	21.8	10.2	24.4	23.3	32.4	121.8	121.8	173.7
Tourism, museums, monuments	31.0	13.7	18.5	31.3	24.3	49.2	56.3	56.4
Education	54.6	72.5	100.8	106.3	92.4	183.7	158.6	167.1
Housing	3.2	3.8	7.8	27.3	17.9	65.9	72.6	107.9
Health, welfare	26.6	19.3	27.1	20.4	25.6	48.0	42.0	72.4
Water supply, sewerage	44.8	60.8	57.5	45.1	36.4	49.5	43.0	57.5
Public administration	7.0	15.0	10.7	14.5	16.6	27.0	26.5	44.7
Research, technology, technical cooperation	8.7	6.1	6.1	22.8	10.5	15.4	22.0	32.6
Prefectural and border-aid projects	191.3	186.4	205.0	270.5	275.0	289.9	302.3	276.2
Special projects in Athens and Thessaloniki	12.9	13.1	22.5	65.2	128.2	102.5	94.6	103.1
Miscellaneous (including amortization and interest payments)	34.8	26.7	33.9	25.9	40.3	48.8	72.7	69.7
Reserve	0.0	0.0	0.0	0.0	0.0	11.0	0.0	15.0
Total 1/	725.9	728.3	807.3	962.0	1,095.2	1,666.0	1,644.0	2,005.0
(In percent of GDP)	(3.9)	(3.5)	(3.4)	(3.6)	(3.8)	(5.1)	(5.0)	(5.7)

Source: Ministry of Finance.

1/ Does not include Dr 48.5 billion paid to the Greek Telecommunication Organization against loan from the European Investment Bank, and Dr 19 billion for increase of Olympic Airways share capital in 1995.

Table 23. Greece: Budget Transfers from and to the European Union

(In billions of drachmas)

	1992	1993	1994	1995	1996	1997		1998
						Budget	Prov.	Budget
Receipts	1,013.8	1,326.7	1,419.4	1,387.1	1,762.7	1,926.4	1,879.7	2,027.9
Ordinary budget	84.1	104.3	141.3	86.0	87.5	67.4	49.0	65.0
Investment budget	182.5	272.1	288.3	321.8	552.0	700.0	700.0	840.0
Special account for Agricultural Guarantees	528.6	709.1	768.2	712.6	858.6	884.1	884.1	900.0
Budget of other tiers of Government	218.6	241.2	221.6	266.7	264.6	274.9	246.6	222.9
Payments	198.1	273.1	306.7	310.0	355.1	396.7	401.5	437.6
Custom duties, etc.	44.2	44.2	37.7	43.8	44.6	54.0	48.1	45.0
GDP or VAT-based contributions	142.9	172.4	221.2	233.7	279.5	313.2	322.1	356.4
Other	11.0	56.5	47.8	32.5	31.0	29.5	31.3	36.2
Net receipts	815.7	1,053.6	1,112.7	1,077.1	1,407.6	1,529.7	1,478.2	1,590.3
(as percent of GDP)	4.3	5.0	4.6	4.1	4.8	4.7	4.5	4.5

Source: Ministry of Finance.

Table 24. Greece: Central Government Expenditure, Functional Classification

(Accrual basis)

	1992	1993	1994	1995	1996	1997		1998	1992	1993	1994	1995	1996	1997		1998
						Budget	Prov.	Budget						Budget	Prov.	Budget
	(In billions of drachmas)								(In percent of total)							
Defense	505	599	694	781	792	912	860	901.1	5.5	5.4	5.8	5.6	5.1	5.8	5.6	5.8
Of which: External debt servicing 1/	130	166	221	230	174	215	110	100	0.7	1.4	1.6	1.8	1.1	1.4	0.7	0.6
Education	573	654	748	862	978	1159	1,164	1248.8	6.8	6.1	6.3	6	6.3	7.3	7.5	8.1
Health, social welfare and insurance	1055	1172	1420	1558	1711	2001	2,026	2211.3	13	11.2	11.3	11.4	11	12.7	13.1	14.3
Agriculture	809	1029	1030	994	1240	1274	419	410.7	10.3	8.6	9.9	8.3	8	8.1	2.7	2.6
Debt service	4167	4236	5766	6110	7156	6248	6,827	6192.1	36.5	44.4	40.9	46.2	45.9	39.6	44.2	39.9
Interest payments 1/ 2/	1926	2528	3239	3337	3470	3286	3,230	3220	22.2	20.5	24.4	26	22.3	20.8	20.9	20.8
Domestic 1/ 2/	1708	2283	2953	2974	3091	2881			19.5	18.2	22	23.7	19.8	18.3		
External	218	245	286	363	379	405			2.7	2.3	2.4	2.3	2.4	2.6		
Amortization	2241	1708	2527	2773	3686	2962	3,597	2972.1	14.2	23.9	16.5	20.3	23.6	18.8	23.3	19.2
Domestic	1658	1127	1897	2039	2892	1788			9.5	17.7	10.9	15.2	18.5	11.3		
External	525	477	517	585	517	867			3.5	5.6	4.6	4.1	3.3	5.5		
Military Dept.	58	104	113	149	277	307			1.2	0.6	1	0.9	1.8	1.9		
Other expenditures	2270	2673	2817	3233	3716	4177	4,153	4537	27.9	24.2	25.8	22.6	23.8	26.5	26.9	29.3
Total expenditures	9379	10363	12474	13539	15593	15770	15,449	15501	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum item:																
Total, excluding amortization	7138	8655	9947	10766	11907	12808	11,852	12,529	85.8	76.1	83.5	79.7	76.4	81.2	76.7	80.8

Source: Ministry of Finance.

1/ Including military debt service.
2/ Including capitalized interest.

Table 25. Greece: Summary of General Government Finances 1/

(In billions of drachmas)

	1992	1993	1994	1995	1996	1997
Central government						
Current revenue	4,340.0	4,819.7	5,805.0	6,748.7	7,445.8	8,530.1
Of which: Tax revenue	3,655.3	4,050.3	4,766.6	5,438.2	5,985.5	6,868.7
Current expenditure	5,832.6	6,977.4	8,239.7	9,405.4	9,805.2	10,162.0
Public consumption	1,796.8	2,096.4	2,324.7	2,939.9	2,889.3	3,401.2
Interest	2,159.0	2,647.9	3,360.7	3,462.1	3,564.9	3,134.6
Net current transfers	1,876.8	2,233.1	2,554.3	3,003.4	3,351.0	3,626.2
Net capital spending	1,205.4	1,148.2	720.0	749.7	687.8	479.0
Of which: Debt assumptions	808.3	740.9	280.6	210.1	113.0	-231.0
Overall balance	-2,698.0	-3,305.9	-3,154.8	-3,406.4	-3,047.2	-2,110.9
without debt assumptions	-2,024.6	-2,624.7	-2,843.7	-3,369.0	-2,987.2	-1,989.8
Primary balance	-539.0	-657.9	205.9	55.7	517.7	1,023.8
without debt assumptions	134.4	23.2	517.0	93.1	577.7	1,144.8
Social security funds						
Current revenue (including state transfers)	2,419.7	3,065.6	3,608.4	4,078.4	4,591.4	4,939.4
Of which: Contributions	1,601.7	1,990.7	2,320.1	2,669.5	2,983.5	3,264.5
Current expenditure	2,321.1	2,769.9	3,103.5	3,524.7	3,924.8	4,359.6
Of which: Interest	5.7	38.4	8.7	0.0	2.0	2.0
Net capital spending	-256.1	-45.4	-158.3	5.3	-53.7	-34.4
Overall balance	354.8	341.2	663.3	548.4	720.3	614.2
Primary balance	360.5	379.6	672.0	548.4	722.3	616.2
Local authorities						
Current revenue (including state transfers)	209.6	240.0	274.3	336.0	387.7	426.4
Current expenditure	166.4	191.7	223.2	254.7	289.4	358.6
Of which: Interest	2.8	7.0	6.0	7.5	8.6	9.7
Net capital spending	58.8	45.8	49.1	66.5	93.2	52.8
Overall balance	-15.6	2.4	2.0	14.9	5.1	15.1
Primary balance	-12.8	9.3	8.1	22.4	13.7	24.7
Hospitals						
Current revenue (including state transfers)	400.0	410.0	460.5	539.3	586.8	708.1
Current expenditure	388.3	405.1	448.4	589.7	707.2	660.5
Of which: Interest	0.3	0.8	0.1	0.2	0.2	0.2
Net capital spending	4.7	8.4	3.5	-51.2	-107.6	10.1
Overall balance	7.0	-3.4	8.5	0.8	-12.7	37.5
Primary balance	7.3	-2.7	8.6	1.0	-12.6	37.7
Other public entities						
Current revenue (including state transfers)	155.7	294.2	299.2	329.2	320.2	429.8
Current expenditure	146.3	186.5	154.8	178.2	218.2	244.4
Of which: Interest	23.0	7.8	5.6	0.0	0.0	0.0
Net capital spending	55.6	51.4	64.6	78.0	75.4	71.3
Overall balance	-46.2	56.3	79.7	73.0	92.1	114.1
Primary balance	-23.2	64.1	85.3	73.0	92.1	114.1
Consolidated general government						
Current revenue	6,327.4	7,396.3	8,767.9	10,085.1	11,214.7	12,612.5
Current expenditure	7,657.0	9,097.4	10,490.2	12,006.2	12,726.1	13,353.7
Primary	5,466.2	6,395.5	7,105.2	8,536.4	9,186.5	10,217.3
Interest	2,190.8	2,701.9	3,381.1	3,469.8	3,557.7	3,146.5
Net capital spending	1,068.4	1,208.4	679.0	848.3	595.1	578.7
General government saving	-1,329.6	-1,701.1	-1,722.3	-1,921.0	-1,547.4	-751.3
Overall balance	-2,398.0	-2,909.4	-2,401.3	-2,769.3	-2,242.5	-1,329.9
Primary balance	-207.2	-207.5	979.8	700.5	1,333.2	1,815.5
Without debt assumptions						
Overall balance	-1,724.6	-2,228.3	-2,090.2	-2,731.9	-2,182.5	-1,208.9
Primary balance	466.2	473.6	1,290.8	739.9	1,393.2	1,937.6

Source: Ministry of National Economy.

1/ Data on a national accounts basis; central government accounts not directly comparable to those compiled by the Ministry of Finance.

Table 26. Greece: Summary of General Government Finances 1/

(In percent of GDP)

	1992	1993	1994	1995	1996	1997	1998
Central government							
Current revenue	23.1	22.8	24.2	25.1	24.9	26.0	25.8
Of which: Tax revenue	19.5	19.2	19.9	20.2	20.0	20.8	...
Current expenditure	31.1	33.0	34.4	35.0	32.8	30.8	29.9
Public consumption	9.6	9.9	9.7	10.9	9.7	10.3	10.1
Interest	11.5	12.5	14.0	12.9	11.9	9.5	9.4
Net current transfers	10.0	10.6	10.6	11.2	11.2	11.0	10.4
Net capital spending	6.4	5.4	3.0	2.8	2.3	1.5	1.6
Of which: Debt assumptions	3.6	3.2	1.3	0.1	0.2	0.4	0.9
Overall balance	-14.4	-15.6	-13.2	-12.7	-10.2	-6.4	-5.0
without debt assumptions	-10.8	-12.4	-11.9	-12.5	-10.0	-6.0	-4.0
Primary balance	-2.9	-3.1	0.9	0.2	1.7	3.1	4.5
without debt assumptions	0.7	0.1	2.2	0.3	1.9	3.5	5.4
Social security funds							
Current revenue (including state transfers)	12.9	14.5	15.0	15.2	15.4	15.0	15.5
Of which: Contributions	8.5	9.4	9.7	9.9	10.0	9.9	9.8
Current expenditure	12.4	13.1	12.9	13.1	13.1	13.2	13.1
Of which: Interest	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Net capital spending	-1.4	-0.2	-0.7	0.0	-0.2	-0.1	0.0
Overall balance	1.9	1.6	2.8	2.0	2.4	1.9	3.3
Primary balance	1.9	1.8	2.8	2.0	2.4	1.9	2.3
Local authorities							
Current revenue (including state transfers)	1.1	1.1	1.1	1.2	1.3	1.3	1.2
Current expenditure	0.9	0.9	0.9	0.9	1.0	1.1	0.9
Of which: Interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net capital spending	0.3	0.2	0.2	0.3	0.2	0.2	0.3
Overall balance	-0.1	0.0	0.0	0.1	0.0	0.0	0.0
Primary balance	-0.1	0.0	0.0	0.1	0.0	0.0	0.1
Hospitals							
Current revenue (including state transfers)	2.1	1.9	1.9	2.0	2.0	2.1	2.1
Current expenditure	2.1	1.9	1.9	2.2	2.4	2.0	1.9
Of which: Interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net capital spending	0.0	0.0	0.0	-0.2	-0.4	0.0	0.0
Overall balance	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Primary balance	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Other public entities							
Current revenue (including state transfers)	0.8	1.4	1.2	1.2	1.3	1.3	0.8
Current expenditure	0.8	0.9	0.6	0.7	0.7	0.7	0.5
Of which: Interest	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Net capital spending	0.3	0.2	0.3	0.3	0.3	0.2	0.3
Overall balance	-0.2	0.3	0.3	0.3	0.3	0.3	0.0
Primary balance	-0.1	0.3	0.4	0.3	0.3	0.4	0.0
Consolidated general government							
Current revenue	33.7	35.0	36.6	37.5	37.6	38.2	38.7
Current expenditure	40.8	43.0	43.7	44.6	42.7	40.5	38.9
Primary	29.1	30.3	29.6	31.7	30.8	30.9	29.4
Interest	11.7	12.8	14.1	12.9	12.0	9.5	9.5
Net capital spending	5.7	5.7	2.8	3.2	2.3	1.8	2.2
General government saving	-7.1	-8.0	-7.2	-7.1	-5.2	-2.3	-0.2
Overall balance	-12.8	-13.8	-10.0	-10.3	-7.5	-4.0	-2.4
Primary balance	-1.1	-1.0	4.1	2.6	4.5	5.5	7.1

Source: Ministry of National Economy.

1/ Data on a national accounts basis; central government accounts not directly comparable to those compiled by the Ministry of Finance.

Table 27. Greece: Public Entities Balance 1/

(In billions of drachmas)

	1992	1993	1994	1995	1996		1997		1998
					Budget	Act.	Budget	Act.	Budget
Operating income	1,049.5	1,285.5	1,497.4	1,714.5	1,964.9	1,905.4	2,179.0	2,208	2,403
Operating expenses	1,640.8	1,861.1	2,163.7	2,427.1	2,788.6	2,707.0	3,149.4	3,228	3,429
Operating deficit	591.3	575.6	666.3	712.6	823.7	801.6	970.4	1,020	1,026
(In percent of GDP)	3.2	2.8	2.9	2.8	2.9	2.9	3.0	3.1	2.9
Workers' Housing Organization (OEK)	-26.8	-38.8	-51.1	-64.0	-80.5	-67.7	-94.1	-83.0	-98.3
Social Insurance Organization (IKA)	350.5	251.4	292.3	332.0	347.0	385.1	489.3	490.3	549.2
Workers' Fund (EE)	-3.8	2.6	-1.6	-1.2	-1.3	-1.3	-2.7	-2.5	-3.2
Labor Force Employment Organization (OAED)	32.0	36.5	28.2	30.2	52.9	11.0	51.0	61.9	59.8
Farmers' Social Insurance Organization (OGA)	145.6	225.9	303.0	314.8	397.4	360.9	400.9	418.9	380.0
National Welfare Organization (EOP)	8.2	8.3	8.3	9.5	10.7	9.8	12.0	12.3	13.5
Seaman's Insurance Fund (NAT-KAAN)	85.6	89.7	87.2	91.4	97.5	104.8	114.0	121.7	125.2
Investment expenditures 2/	26.3	33.4	41.7	46.8	78.2	47.1	96.1	81.2	80.8
Other expenditures	15.7	51.0	39.0	44.0	49.0	49.0	54.0	54.5	58.6
Operating and investment deficit	633.3	660.0	747.0	803.4	950.8	897.7	1,020.5	1,155.7	1,165.4
(In percent of GDP)	3.5	3.2	3.2	3.1	3.4	3.3	3.4	3.5	3.3
Less:									
State contributions									
Ordinary budget	388.0	523.9	632.6	641.6	692.8	720.5	752.0	754.6	784.1
Investment budget	45.4	48.2	92.0	89.0	121.6	80.2	122.6	125.2	136.0
Depreciation and special resources	8.9	29.5	31.0	46.9	42.2	47.1	43.9	45.4	45.4
Net borrowing requirement	191.0	58.4	-8.5	25.9	94.2	49.9	202.0	321.3	199.9
Workers' Housing Organization (OEK)	0.1	-2.5	-22.1	-38.8	-30.6	-41.2	-30.4	-30.0	-48.7
Social Insurance Organization (IKA)	171.9	48.7	30.8	78.2	60.1	120.1	202.3	213.0	292.3
Workers' Fund (EE)	-3.3	2.9	-1.3	-0.7	-0.5	-0.5	-1.8	-1.6	-1.0
Labor Force Employment Organization (OAED)	-10.7	-45.4	-47.3	-41.9	-34.2	-64.7	-45.2	-50.1	-56.6
Farmers' Social Insurance Organization (OGA)	-22.7	-5.2	-17.1	-24.0	37.3	-22.2	-0.2	-30.0	-51.4
National Welfare Organization (EOP)	0.0	-0.2	0.0	1.5	3.6	1.4	1.9	0.6	1.9
Seaman's Insurance Fund (NAT-KAAN)	55.9	60.2	48.4	51.6	58.5	56.9	75.5	83.1	63.7
Memorandum item:									
Interest payments	123.8	67.2	59.6	52.8	32.4	32.4	35.0		
Of which: Social Insurance Organization (IKA)	94.9	45.0	50.0	50.0	30.0	30.0	33.0		

Source: Ministry of Finance.

1/ Covers seven major public entities.
2/ Excluding amortization payments.

Table 28. Greece: Public Enterprise Balance 1/

(In billions of drachmas)

	1992	1993	1994	1995	1996		1997		1998
					Budget	Outturn	Budget	Prov.	Budget
Operating revenue	2,049.7	2,416.4	2,728.3	2,971.0	3,292.5	3,368.6	3,576.0	3,609.8	3,980.1
Operating expenditures 2/	1,940.1	2,291.5	2,630.9	2,757.6	2,965.0	3,098.9	3,212.1	3,367.4	3,563.3
Of which:									
Wages and salaries	550.9	606.3	770.7	839.2	897.9	942.5	1,015.0	1,034.1	1,060.3
Fuel	136.4	155.0	160.9	174.1	196.8	213.0	223.0	221.6	242.2
Interest payments	183.8	159.3	186.5	179.5	178.2	179.9	180.3	183.1	182.1
Depreciation	214.2	300.5	322.7	296.4	354.9	318.7	336.7	377.7	368.4
Other	854.8	1,070.4	1,190.1	1,268.4	1,337.1	1,444.7	1,457.1	1,550.9	1,710.3
Operating balance 3/	109.6	180.2	97.4	213.4	327.6	269.7	363.9	242.4	416.9
(In percent of GDP)	0.6	0.6	0.4	0.8	1.1	0.9	1.1	0.7	1.2
Investment expenditures 4/	608.4	787.0	720.1	855.7	1,227.7	1,052.1	1,299.3	1,261.0	1,611.5
Other need of funds	73.8	93.2	308.7	287.7	291.2	166.9	242.8	304.7	267.1
Operating and investment deficit	572.6	700.0	931.4	930.0	1,191.3	949.3	1,178.2	1,323.3	1,461.7
(In percent of GDP)	3.1	3.3	3.9	3.5	4.0	3.2	3.6	4.0	4.1
Less:									
State contributions:									
Ordinary budget	-33.0	3.2	24.4	34.0	22.8	38.1	35.3	-17.6	-14.7
Investment budget, etc.	233.2	288.3	310.5	360.2	523.2	470.5	537.5	492.9	624.8
Depreciation and special resources	324.1	392.3	581.7	432.7	587.5	562.5	530.4	936.6	884.3
Net borrowing requirement 3/ 4/	48.3	71.5	14.7	103.1	57.7	-121.8	75.1	-88.6	-32.6
Of which:									
Public Power Corporation	-27.0	5.7	-23.8	-16.4	6.5	58.8	15.0	56.7	64.4
Hellenic Telecommunications Organization	-1.2	-16.4	37.5	36.9	-84.9	-264.6	-79.6	-221.1	-174.8
Greek Railways	29.5	62.4	33.1	75.6	56.2	58.0	73.3	73.8	54.6
Olympic Airways	27.8	19.7	-14.6	-34.9	-57.7	-25.8	-30.7	-48.8	-48.9
Athens Urban Transport Organization	19.6	14.2	33.6	20.7	48.1	44.8	56.3	59.7	58.5
Hellenic Aerospace Industry	3.7	9.1	11.1	10.1	5.6	0.1	3.6	6.6	3.3
Greek Post Office	-0.6	4.8	16.5	41.9	47.4	53.8	25.8	34.7	50.6
Athens Water and Sewerage	14.8	-11.7	-10.0	-10.5	0.0	-10.3	-1.7	-9.1	2.6
Other	-18.3	-16.3	-68.7	-20.3	36.5	-36.6	13.1	-41.1	-42.7

Source: Ministry of National Economy.

1/ Covers 46 major public enterprises.
2/ Breakdown into components are estimates.
3/ Surplus (+) or deficit (-).
4/ Excluding amortization payments.

Table 29. Greece: Operating Balance of Selected Public Enterprises

(In billions of drachmas)

	1992	1993	1994	1995	1996	1997		1998
						Budget	Prov.	Budget
Public Enterprises								
Public Power Corporation	29.7	-2.7	9.3	59.1	80.3	99.0	20.5	45.0
State Oil Refinery	13.0	11.9	10.0	7.4	17.2	11.0	19.8	18.8
State Petroleum Industry	4.0	8.2	19.2	6.7	12.0	12.0	11.0	14.1
Institute for Geological and Mining Research	0.1	0.2	-5.4	-6.2	-7.0	-7.1	-7.5	-7.9
National Organization of Greek Handicrafts	-1.9	-7.5	-2.8	0.4	-3.0	0.9	-3.4	-3.6
Hellenic Telecommunications Organization	101.9	140.6	176.1	203.7	250.3	304.4	303.0	368.0
Greek State Railways	-52.3	-70.7	-80.6	-84.1	-110.6	-103.9	-116.9	-97.7
Olympic Airways	-21.5	-15.7	0.9	6.5	11.2	13.5	28.1	30.4
Greek Post Office	-17.0	-10.7	-16.9	-18.6	-14.0	-11.3	-21.0	-15.7
Athens Urban Transport Organization 1/	-22.9	-23.5	-53.0	-66.1	-78.9	-69.3	-88.9	-82.8
National Broadcasting Corporation	-2.3	-14.5	-14.5	-4.3	-5.6	-8.9	-9.5	3.2
National Tourism Organization	-2.6	-3.5	-4.7	-5.4	-4.2	-3.2	-3.4	-5.0
Piraeus Port Authority	9.2	2.3	3.2	6.2	3.9	0.6	-0.6	-0.3
Athens Water and Sewerage	-24.6	5.2	-1.0	-1.2	9.3	6.7	5.4	6.0
Hellenic Aerospace Industry	-0.9	2.6	1.0	0.5	-3.6	0.4	-2.4	0.7
Other public enterprises 2/	97.7	102.7	56.6	108.9	112.3	119.1	108.2	143.5
Total public enterprises	109.6	124.9	97.4	213.4	269.7	363.9	242.4	416.9

Sources: Ministry of Finance and Ministry of National Economy.

1/ Including Thermic Buses Corporation (since June 1994), Athens Piraeus Trolley Buses, and Athens Piraeus Electric Railways.

2/ Thirty-one additional public enterprises.

Table 30. Greece: Financing of the PSBR

(In billions of drachmas)

	1992	1993	1994	1995	1996	1997 Prov.
Central government balance (cash basis)	-1,965	-2,941	-2,976	-2,994	-3,856	-2,556
Petroleum and other account balance	-89	-128	-45	-55	-14	-25
Public entity balance	159	295	516	546	674	511
General government balance	-1,895	-2,774	-2,505	-2,503	-3,223	-2,070
Public enterprise balance	35	6	-205	1	-83	75
Public sector borrowing requirement	-1,860	-2,768	-2,710	-2,502	-3,306	-1,995
Financing						
Domestic	1,708	2,004	2,420	1,038	3,013	766
Bank	738	972	798	-50	-100	116
Bank of Greece 1/	213	-20	14	-438	-152	204
Treasury bills and bonds purchased by banks and specialized credit institutions	-242	395	451	327	-166	38
Loans and advances from banks and specialized credit institutions	271	238	74	-23	39	-161
Capitalized interest	497	360	259	84	179	35
Nonbank	970	1,032	1,622	2,088	3,113	650
Foreign	152	765	290	464	293	1,229
Net foreign borrowing by central governme	135	554	184	298	181	1,332
Net foreign borrowing by public entities and enterprises	30	-46	2	-44	-39	-134
Net foreign borrowing for oil imports	0	0	0	0	0	0
Net investment in government paper by noı	-13	257	60	-118	-209	31
Net investment in government paper by domestic banks (in foreign exchange)	0	0	44	328	360	0
Memorandum items:						
Percent of PSBR (cash basis) financed by						
Banking system	40	35	30	-2	-3	6
Of which: Bank of Greece	12	-1	1	-18	-5	10
Nonbank public	52	37	60	84	94	32
External financing	8	28	11	19	9	62

Source: Bank of Greece.

1/ Including treasury bills and bonds held by the Bank of Greece, as well as changes in the balance of the petroleum account through 1992.

Table 31. Greece: Gross General Government Debt

(In billions of drachmas; end of period)

	1992	1993	1994	1995	1996	1997 Prov.
Central administration	16,443	23,431	27,168	30,970	35,291	38,057
Drachma-denominated	12,128	15,017	17,646	21,189	27,315	28,917
Treasury bills	5,601	5,766	7,533	8,422	10,012	6,784
Bonds	821	2,452	3,380	5,939	9,772	15,236
Bonds for debt consolidation and restructuring, share capital increases, etc.	4,220	5,397	5,179	5,291	4,736	4,171
Bank of Greece	1,347	1,402	1,367	1,331	1,295	1,259
Short-term 1/	886	977	977	977	977	977
Long-term	461	425	390	354	318	282
Other	139	188	187	206	205	208
Of which: Participation in international institutions	134	182	182	201	201	203
Foreign currency-denominated	4,315	8,226	9,522	9,781	9,271	10,399
Foreign currency-linked bonds	976	1,702	1,879	1,574	239	151
External	3,339	4,482	5,388	5,672	6,377	7,453
Bank of Greece 2/	0	2,042	2,255	2,535	2,655	2,795
Armed forces	660	829	924	1,012	955	983
Drachma-denominated	59	74	82	92	99	105
Foreign currency-denominated	601	755	842	920	856	878
Of which: External	601	755	842	920	856	878
Central government (1 + 2)	17,103	24,260	28,092	31,982	36,246	39,040
In percent of GDP	92	115	118	121	121	118
Drachma-denominated	12,187	15,279	17,728	21,281	26,119	27,783
Foreign currency-denominated	4,916	8,981	10,364	10,701	10,127	11,277
Foreign currency-linked bonds	976	1,702	1,879	1,574	239	151
External	3,940	5,237	6,230	6,592	7,233	8,331
Bank of Greece 2/	0	2,042	2,255	2,535	2,655	2,795
Local authorities	71	80	87	93	121	123
Drachma-denominated	61	71	79	83	114	123
Foreign currency-denominated	10	9	8	7	7	0
Of which: External	10	9	8	7	7	0
Social security funds	343	369	221	242	191	193
Drachma-denominated	343	369	221	242	191	193
Foreign currency denominated	0	0	0	0	0	0
Other	118	76	96	93	90	82
Inter-governmental debt	794	1,031	2,091	2,608	3,123	3,367
8. General government (Maastricht definition)						
(3 + 4 + 5 + 6 - 7 - 1.A)	16,707	23,592	26,223	29,603	33,324	35,868
In percent of GDP)	89.4	111.8	110.4	111.8	111.6	108.6
Drachma-denominated	11,797	14,688	15,937	18,998	23,190	24,584
Foreign currency-denominated	4,926	8,990	10,372	10,708	10,134	11,284
Foreign currency-linked bonds	976	1,702	1,879	1,574	239	151
External	3,950	5,246	6,238	6,599	7,240	8,338
Bank of Greece	0	2,042	2,255	2,535	2,655	2,795

Sources: Ministry of Finance; and Bank of Greece.

1/ Replaced by long-term bonds at end-1993.
2/ Bonds issued in 1993 to cover valuation differences.

Table 32. Greece: Monetary Program and Outturn 1/

(End of period)

	1993		1994		1995		1996		1997	
	Program	Outturn	Program	Outturn	Program	Outturn	Program	Outturn	Program	Outturn
					(Annual percentage changes)					
Broad money (M3)	9-12	15.0	8-11	8.8	7-9	10.3	6-9	9.3	6-9	9.5
Of which:										
Currency in circulation	...	7.2	...	11.6	...	10.5	...	4.2	...	11.1
Private sector deposits	...	8.8	...	24.6	...	15.0	...	13.9	...	
M4	...	15.3	...	13.9	11-13	8.2 3/	9-12	12.0	8-11	-1.6
Domestic credit (net) 2/	5-7	11.5	6-8	8.9	6-8	8.1	5-7	5.3	4-6	9.3
Private sector	13-15	12.3	11.0	13.5	...	21.5	...	14.2	...	14.9
Public sector 2/	...	11.2	...	7.0	...	2.4 4/	...	1.0	...	6.4
Drachma/ECU	...	6.6	...	5.6	3.0	3.0	broadly stable	1.0	stable	1.7
Nominal GDP	14.6	12.6	12.3	13.2	9.5	11.1	9.9	11.3	10.4	10.6
CPI	10.0	12.1	less than 10	10.7	7.0	7.9	5.0	7.3	4.5	4.7
					(In billions of drachmas)					
Broad money (M3) 2/	1,140-1,520	1,886.3	1,200-1,600	1,280.7	1,200-1,400	1,625.0	1,040-1,540	1,625.0	1,150-1,700	1,802.0
Domestic credit (net)	970-1,150	2,157.1	1,400-1,600	1,915.0	...	1,917.0	...	1,607.0	...	2,921.00
Private sector	780-900	780.5	700	827.0	...	1,503.0	...	1,414.0	...	1,576.0
Public sector	70-370	1,376.6	700-900	1,088.0	...	414.0	...	193.0	...	1,345.0
Sales of government debt to the nonbank public	900-1,200	1,031.5	1,300-1,500	1,621.6	...	2,088.0	...	3,113.0	...	650.0

Source: Bank of Greece.

1/ The definition of net domestic credit and credit to the public sector in the monetary program is different from that in the monetary survey; it includes borrowing by the public sector directly from abroad, as well as capitalized interest. Also, for all credit aggregates the data do not reflect the exchange of government-guaranteed credit for government bonds.

2/ Percentage changes in credit to the public sector and net domestic credit are calculated as the flows during the year excluding valuation adjustments over the stock of debt outstanding at the end of the previous year.

3/ M4 was revised to include secondary market transactions from 1995 on.

4/ NDC to the public sector in 1995 is affected by the inclusion of secondary-market sales of government paper from bank portfolios to the nonbank public.

Table 33. Greece: Monetary Survey 1/

(In billions of drachmas; end of period)

	1992	1993	1994	1995	1996	1997 Prov.
Net domestic credit	16,087.0	18,386.4	20,121.7	22,414.0	24,140.6	26,138.3
Private sector 2/	6,360.3	6,648.7	7,536.4	9,157.0	10,391.0	12,011.8
Net public sector 3/	9,726.7	11,737.7	12,585.3	13,257.0	13,749.6	14,126.4
Central government 4/	9,821.9	11,843.0	12,131.5	12,783.4	13,414.8	13,990.2
Public enterprises	242.6	282.5	405.6	449.8	498.0	557.7
Public entities	-337.9	-387.8	48.2	23.8	-164.0	-421.4
Net foreign assets (short-term)	-687.8	205.4	1,499.7	1,479.2	3,138.7	-17.1
Foreign deposits	3,445.0	4,117.4	4,439.0	4,999.1	5,258.9	8,263.3
Foreign assets	2,757.2	4,322.8	5,938.7	6,478.3	8,397.6	8,246.2
Other items (net assets)	-2,810.6	-4,117.0	-5,866.0	-6,512.8	-8,274.0	-5,313.7
Of which:						
Long-term foreign currency liabilities	3,756.7	5,058.1	6,211.0	7,272.6	7,931.4	6,319.3
Long-term foreign currency claims on government	2,440.9	3,596.3	3,294.5	2,750.2	2,129.6	1,578.8
Broad money (M3) 5/	12,588.5	14,474.8	15,755.5	17,380.4	19,005.2	20,807.4
Narrow money (M1) 5/	1,968.2	2,223.7	2,793.5	3,149.0	3,548.0	4,002.6
Currency in circulation	1,410.1	1,512.0	1,687.7	1,863.6	1,941.4	2,185.5
Private sight deposits	558.2	711.7	1,105.8	1,285.4	1,606.6	1,817.1
Quasi money	8,967.9	9,653.7	11,805.7	13,564.6	15,308.3	16,641.7
Private savings deposits	6,915.4	7,709.7	8,811.5	10,445.4	12,201.7	13,301.6
Private time deposits	2,052.6	1,943.9	2,994.2	3,119.2	3,106.6	3,330.1
Bank bonds	673.7	703.5	838.4	570.8	59.8	121.3
Repos	978.6	1,893.9	317.8	96.0	89.2	41.3
Memorandum items: 5/						
M1 plus public sector sight deposits	2,357.1	2,687.6	3,299.4	3,718.1	4,295.8	4,940.9
M3 plus public sector deposits	13,682.0	15,846.7	16,665.0	18,746.6	20,515.0	22,354.9
M3 plus foreign exchange deposits	16,033.5	18,592.2	20,194.4	22,379.5	24,264.1	29,070.7
M4, total drachma financial assets	16,101.5	18,566.9	21,149.4	22,889.6	25,636.4	25,213.7

Source: Bank of Greece.

1/ Revised data not comparable to previous years, due to a change in the reporting system. Data reflect the exchange of government-guaranteed credit for government bonds. Also, net credit to the central government in 1991–95 includes capitalized interest on government bonds held by commercial banks.

2/ Includes securities and loans in foreign currency.

3/ Excluding long-term loans in foreign currency by the Bank of Greece.

4/ Net domestic credit to the central government now includes Bank of Greece foreign exchange differences.

5/ The monetary aggregates are defined as follows: narrow money (M1) is currency plus private sight deposits (excluding blocked deposits); broad money (M3) is M1 plus time and savings deposits, bank bonds and repurchase agreements; total drachma financia assets (M4) is M3 plus private sector holdings of T-bills and government bonds of maturity up to one year.

Table 34. Greece: Growth of Money and Credit Aggregates 1/

(In percent per annum; end of period)

	1992	1993	1994	1995	1996	1997
Money						
Currency in circulation	12.3	7.2	11.6	10.4	4.2	12.6
M1, narrow money	12.9	13.0	25.6	12.7	12.7	12.8
M3, broad money	14.4	15.0	8.8	10.3	9.3	9.5
M3 plus foreign exchange deposits	17.0	16.0	8.6	10.8	8.4	19.8
Foreign currency deposits	27.5	19.5	7.8	12.6	5.2	57.1
M4, total drachma financial assets	19.2	15.3	13.9	8.2	12.0	-1.6
Credit 2/						
Net domestic credit	17.1	13.5	8.9	8.1	5.3	9.3
Credit to private sector 3/	14.2	12.3	13.5	21.5	14.2	14.9
Net credit to public sector	19.6	14.1	7.0	2.4	1.0	6.4
Of which: Credit to central government	25.6	22.6	2.4	5.4	0.5	4.3

Sources: Bank of Greece; and Fund staff calculations.

1/ Figures include capitalized interest on government bonds held by commercial banks. Data also reflect the exchange of government-guaranteed credit for government bonds.

2/ Excluding long-term loans to government in foreign currency by the Bank of Greece.

3/ Including securities and loans in foreign currency.

Table 35. Greece: Distribution of Bank Credit to the Private Sector 1/
(End of period)

	1992	1993	1994	1995	1996	1997	1997	
	Annual percentage change						In blns of Dr	In percent
Total private sector	17.1	17.3	17.1	30.1	22.4	19.5	7,482	100.0
Agriculture	18.1	6.1	7.0	14.6	5.5	...	...	...
Manufacturing and mining	12.1	10.4	12.8	21.9	17.6	4.1	1,806	24.1
Of which:								
Industry and mining	13.3	5.3	12.2	13.8	12.7	...	...	...
Short- and medium-term	17.7	7.4	14.5	19.5	16.9	...	...	...
Long-term	4.6	0.5	7.2	0.4	1.1	...	...	..
Small-scale industries	8.0	2.4	10.4	17.9	8.5	10.5	712	9.5
Trade	32.6	25.9	17.5	28.1	19.8	23.6	2,219	29.7
Housing	10.3	11.9	11.5	19.4	83.8	56.9	470	6.3
Other	23.6	22.0	21.6	38.0	25.0	...	...	...
Of which: Consumer credit	32.1	32.9	77.0	78.7	34.4	27.9	688	9.2

Source: Bank of Greece.

1/ Without taking into account the reduction in outstanding bank credit caused by the conversion of loans guaranteed by the government into government bonds. These conversions were: 1991 Dr 54.3 billion; 1992 Dr 185.0 billion; 1993 Dr 492.1 billion; and 1994 Dr 31.9 billion.

Table 36. Greece: Short-term Interest Rates

(In percent)

	Interbank rates		Deposit rates		Short-term bank lending rate	Inflation
	(End of month)	(Monthly average) (Overnight)	One month term deposits (End of month)	on 12 month term deposits (End of month)	(Monthly average)	(12 month change in CPI)
1995						
January	17.7	16.9	16.4	18.4	25.6	10.7
February	17.0	16.8	16.1	18.4	25.6	10.0
March	16.8	17.0	16.1	18.1	25.3	9.9
April	16.1	16.6	15.8	18.1	23.9	9.4
May	16.4	16.0	15.6	17.1	23.5	9.6
June	15.5	15.9	14.8	16.9	23.1	9.5
July	15.5	15.5	14.7	15.8	21.9	8.5
August	15.9	15.3	14.5	15.7	21.8	8.3
September	15.8	15.6	14.3	15.4	21.7	8.1
October	15.2	15.0	14.3	15.2	21.6	7.8
November	14.7	14.9	14.4	15.0	21.5	7.8
December	14.1	14.4	14.1	14.5	21.1	7.9
1996						
January	13.8	13.9	13.3	14.7	21.4	8.4
February	13.8	13.8	13.1	14.6	21.2	8.4
March	13.8	13.8	13.0	14.6	21.2	8.9
April	13.4	13.6	12.9	14.5	21.2	8.8
May	13.4	13.4	12.9	13.9	21.2	8.7
June	14.1	13.6	13.1	13.9	21.2	8.4
July	13.3	13.3	12.7	14.4	21.2	8.1
August	12.4	12.8	12.4	13.2	21.1	8.0
September	13.8	12.6	12.3	12.6	20.6	7.9
October	13.4	12.8	12.0	12.5	20.5	8.0
November	13.4	13.3	12.0	12.3	20.5	7.5
December	12.6	12.8	12.0	11.9	20.2	7.3
1997						
January	12.4	12.4	11.2	11.3	19.9	6.8
February	11.9	12.1	10.8	10.3	19.6	6.5
March	10.4	11.7	10.1	10.1	19.3	6.0
April	10.5	10.8	9.7	9.7	19.0	5.9
May	10.9	10.6	9.5	9.6	18.7	5.4
June	11.0	11.7	10.0	9.6	18.3	5.6
July	11.5	11.7	10.3	9.6	18.2	5.4
August	11.4	11.6	10.2	9.6	18.2	5.6
September	11.0	11.0	10.0	9.5	18.4	4.9
October	131.7	16.9	17.1	9.5	18.2	4.7
November	11.1	23.7	12.7	11.3	20.1	5.2
December	11.0	11.0	11.2	11.2	19.8	4.7

Source: Bank of Greece.

Table 37. Greece: Official Interest Rates

(In percent)

Date of Change	Discount Rate	Lombard Rate	Overdraft Rate on Banks' Current Account with the Bank of Greece
1992			
1/1	19.0	...	26.0-30.0 1/
9/18	19.0	...	40.0
10/21	19.0	...	35.0
1993			
6/16	21.5	25.5	29.0
8/13	21.0	24.5	29.0
10/1	22.0	26.5	32.0
10/26	21.5	25.5	30.0
1994			
5/16	22.5	26.5	33.0 2/
5/31	22.5	26.5	33.0 3/
6/21	22.5	26.5	33.0 4/
7/11	22.5	26.5	33.0
9/28	21.5	25.0	30.0
11/21	20.5	24.0	30.0
1995			
3/31	20.5	24.0	28.0
7/27	19.5	23.0	27.0
8/25	18.5	22.0	27.0
12/18	18.0	21.5	27.0
1996			
4/22	17.5	21.0	26.0
12/18	16.5	21.0	25.0
1997			
2/17	15.5	20.0	25.0
3/28	15.5	20.0	25.0
5/13	14.5	19.0	24.0
7/25	14.5	19.0	24.0
8/18	14.5	19.0	24.0
10/8	14.5	19.0	24.0
10/31	14.5	19.0	24.0
1998			
1/9	14.5	23.0	24.0
3/31	14.5	19.0	22.0

Source: Bank of Greece.

1/ According to the size of the overdraft.
2/ In addition, a penalty surcharge of 0.4 percent per day was imposed on bank overdrafts.
3/ In addition, a penalty surcharge of 0.3 percent per day was imposed on bank overdrafts.
4/ In addition, a penalty surcharge of 0.1 percent per day was imposed on bank overdrafts.

Table 38. Greece: Bank Interest Rates

(End of period; in percent per annum)

	1992	1993	1994	1995				1996				1997				1998
				I	II	III	IV	I	II	III	IV	I	II	III	IV	I
Lending rates																
Bank of Greece																
Rediscount rate	19.0	21.5	20.5	20.5	20.5	18.5	18.0	18.0	17.5	17.5	16.5	15.5	14.5	14.5	14.5	14.5
Lombard facility 1/	...	25.5	24.0	24.0	24.0	22.0	21.5	21.5	21.0	21.0	21.0	20.0	19.0	19.0	19.0	19.0
Maximum penalty rate	35.0	30.0	30.0	28.0	28.0	27.0	27.0	27.0	26.0	26.0	25.0	25.0	24.0	24.0	24.0	22.0
Commercial banks																
Short-term		28.4	26.4	...	...	21.7	21.1	21.2	21.2	20.6	20.2	19.3	18.3	18.4	19.1	19.3
Long-term		26.9	25.4	...	...	19.6	19.2	19.5	18.8	18.8	18.7	17.2	16.0	16.3	17.5	16.6
Deposit rates																
Time deposits																
- 1 month	20.1	19.6	16.7	16.1	14.8	14.3	14.2	13.0	13.1	12.2	12.1	10.1	10.0	10.0	11.2	11.4
- 3 months	20.5	18.5	17.7	16.8	15.5	14.5	14.3	13.7	13.9	12.8	12.6	10.6	10.3	10.4	13.2	12.3
- 12 months	20.2	20.0	18.6	18.1	16.9	15.4	14.9	14.7	14.4	13.3	12.9	10.1	9.6	9.5	11.2	11.1
Interbank rates (overnight)	31.3	20.1	17.0	16.8	15.5	15.8	14.1	13.8	14.1	13.8	12.6	10.4	11.0	11.3	10.8	10.3

Source: Bank of Greece.

1/ The Lombard facility was introduced on June 16, 1993.

Table 39. Greece: Interest Rates on Government Paper

(End of period, in percent per annum)

	Treasury Bill Yield			Government Drachma Bonds					Inflation
	3-month	6-month	12-month	2-year zero coupon	3-year 1/	5-year 1/	7-year 1/	10-year 1/	(12 month change in CPI)
1995									
January	15.8	16.5	17.5	...	18.5	19.0	19.5	...	10.7
February	15.5	16.2	17.0	...	18.0	18.5	19.0	...	10.0
March	15.2	16.0	16.8	...	17.8	18.2	18.8	...	9.9
April	15.0	15.8	16.5	...	17.5	18.0	18.5	...	9.4
May	14.8	15.5	16.0	...	17.0	17.5	18.0	...	9.6
June	14.5	15.2	15.8	...	16.8	17.2	17.8	...	9.5
July	14.3	14.8	15.3	...	...	...	...	...	8.5
August	13.8	14.3	14.8	...	...	16.2	16.8	...	8.3
September	13.4	13.8	14.2	...	15.2	15.8	16.2	...	8.1
October	13.1	13.5	14.0	...	...	...	...	...	7.8
November	13.1	13.5	13.9	...	14.9	15.4	15.9	...	7.8
December	...	...	14.2	...	...	...	...	...	7.9
1996									
January	12.9	13.1	13.8	...	...	...	...	...	8.4
February	12.5	12.7	13.4	...	14.3	14.8	15.3	...	8.4
March	12.4	12.6	13.3	...	...	...	14.9	...	8.9
April	12.4	12.6	13.3	...	...	...	14.8	...	8.8
May	12.4	12.6	13.3	...	...	...	14.8	...	8.7
June	12.4	12.6	13.3	...	...	...	14.8	...	8.4
July	12.0	12.2	12.8	...	...	...	14.5	...	8.1
August	11.9	12.1	12.7	...	...	...	14.3	...	8.0
September	11.9	12.1	12.7	...	...	...	...	...	7.9
October	11.5	11.7	12.3	...	...	...	14.0	...	8.0
November	10.5	10.8	11.5	...	11.0	...	13.4	...	7.5
December	10.2	10.5	11.2	...	10.7	...	12.6	...	7.3
1997									
January	9.8	10.1	10.9	10.3	10.2	...	...	...	6.8
February	9.4	9.7	10.5	10.1	...	...	...	...	6.5
March	9.2	9.5	10.3	10.1	10.1	9.6	9.1	...	6.0
April	9.2	...	10.3	9.9	...	...	...	...	5.9
May	8.5	8.8	9.6	...	...	...	...	...	5.4
June	...	...	9.6	...	9.6	9.2	9.0	8.9	5.6
July	...	...	9.6	...	...	9.6	9.5	9.3	5.4
August	8.4	8.7	9.5	...	...	...	...	...	5.6
September	...	...	9.5	...	...	9.7	9.7	9.1	4.9
October	...	...	11.3	...	10.0	10.1	9.7	9.2	4.7
November	13.3	...	11.7	...	...	...	...	...	5.2
December	12.9	12.7	11.4	...	...	...	...	...	4.7

Sources: Bank of Greece; and IMF, *International Financial Statistics*.

1/ Tender rate at issue, which may vary from the coupon rate

Table 40. Greece: Exchange Rates
(Percentage changes) 1/

	1991	1992	1993	1994	1995	1996	1997
Rate of Greek drachma against:							
U.S. Dollar, period average	-13.0	-4.4	-16.8	-5.5	4.7	-3.8	-11.8
End of period	-10.1	-18.3	-13.9	3.8	1.3	-4.0	-12.6
ECU, period average	-10.6	-8.7	-8.0	-6.7	-4.1	-0.6	-2.3
End of period	-8.9	-9.7	-6.5	-5.6	-3.0	-1.0	-1.7 2/
DM, period average	-10.7	-10.0	-12.0	-7.2	-7.5	1.1	1.6
End of period	-8.7	-13.0	-7.9	-6.9	-6.2	4.1	.7
Nominal effective exchange rate							
Bank of Greece index 3/	-11.2	-8.3	-9.2	-7.1	-3.5	-1.1	-1.9
IFS	-11.1	-7.9	-7.8	-6.8	-3.0	-1.7	-2.0
Real effective exchange rate							
Manufacturing unit labor costs (BoG)	-6.1	-3.3	-4.9	3.8	6.9	4.9	2.4
Relative unit labor costs 2/	-8.6	-1.3	1.1	3.7			
Relative normalized unit labor costs (IMF)	-3.2	-1.3	-3.2	1.7	6.0	5.7	4.0
Relative producer prices (BoG)	1.2	1.9	0.3	0.8	0.9	3.7	0.6
Relative consumer prices (BoG)	0.5	2.5	1.3	0.4	2.7	4.8	1.8
EU countries	2.2	1.4	3.4	0.7	1.9	4.1	2.5
Relative consumer prices (IFS)	1.2	3.1	0.5	1.1	3.3	4.3	0.9
Memorandum items:							
Drachma per U.S. dollar							
End of period	175.3	214.6	249.2	240.1	237.0	247.0	282.6
Period average	182.3	190.6	229.2	242.6	231.7	240.7	273.1
Drachma per DM							
End of period	115.6	132.9	144.4	155.0	165.4	158.9	157.7
Period average	109.8	122.1	138.7	149.5	161.6	160.0	157.5

Sources: Bank of Greece; IMF, *International Financial Statistics*; and Fund staff calculations.

1/ Foreign currency per drachma; a negative sign denotes a depreciation.
2/ Based on OECD data. Unit Labor Costs in the business sector relative to a group of 18 industrial countries weighted by their share in Greece's trade in 1992. The countries include all the EU countries, excluding all the EU countries, excluding Luxembourg, the United States, Japan, and the EFTA counties excluding Ireland.
3/ Non-oil trade weighted vis-a-vis 15 competitor countries (1981--84 weights).

Table 41. Greece: Official Reserves

(In millions of U.S. dollars; end of period)

	1992	1993	1994	1995	1996	1997	1996				1997				1998
							Mar.	Jun.	Sep.	Dec.	Mar.	Jun.	Sep.	Dec.	Mar.
Gold	746.5	856.3	850.9	871.7	833.2	684.5	872.1	872.5	873.0	833.2	833.5	833.7	834.3	684.5	679.5
SDRs	0.0	0.2	0.3	0.0	0.6	0.3	1.0	0.4	0.5	0.6	0.2	0.5	0.1	0.3	0.6
Reserve Position in the Fund	160.7	156.2	166.0	169.0	163.5	153.4	166.1	164.1	163.6	163.5	157.7	157.8	155.2	153.4	151.7
Foreign Exchange	4,632.9	7,634.0	14,321.6	14,611.0	17,337.3	12,441.1	15,053.7	11,918.1	15,696.2	17,337.3	18,292.1	15,227.8	11,714.5	12,441.1	19,522.2
Total	5,540.1	8,646.6	15,338.8	15,651.7	18,334.6	13,279.3	16,092.9	12,955.1	16,733.3	18,334.6	19,283.5	16,219.8	12,704.1	13,279.3	20,353.4
Memorandum Items:															
Official reserves in months of current year imports	3.6	5.9	9.8	8.2	9.5	6.7	8.4	6.6	8.5	9.5	9.8	8.2	6.4	6.7	10.3

Sources: IMF, *International Financial Statistics*; and Bank of Greece.

Table 42. Greece: Balance of Payments

(In millions of U.S. dollars; on a settlement basis)

	1992	1993	1994	1995	1996	1997
Imports, c.i.f.	19,902	17,616	18,742	22,929	24,136	23,643
Of which: Petroleum products	2,276	1,947	1,943	2,230	2,880	2,784
Exports, f.o.b.	6,009	5,034	5,219	5,783	5,770	5,372
Of which: Petroleum products	627	534	606	491	652	592
Trade balance	-13,893	-12,582	-13,523	-17,146	-18,366	-18,271
Of which: Non-oil	-12,244	-11,169	-12,186	-15,407	-16,138	-16,079
Oil	-1,649	-1,413	-1,337	-1,739	-2,228	-2,193
Invisible receipts	17,265	17,023	18,767	20,770	20,444	19,966
Travel	3,272	3,335	3,905	4,136	3,723	3,771
Transportation	1,983	1,920	1,957	2,190	2,264	2,104
Convertible drachma accounts	3,012	2,290	2,640	2,810	3,006	3,060
Private transfers	2,432	2,431	2,657	3,071	2,996	2,924
EU transfers (net)	4,068	4,085	4,307	4,968	5,057	4,622
Other	2,498	2,962	3,301	3,596	3,399	3,484
Invisible payments	5,451	5,158	5,366	6,475	6,618	6,528
Of which: Interest and dividends	2,370	2,086	2,101	2,683	3,003	2,482
Invisibles balance	11,814	11,865	13,401	14,296	13,826	13,438
Current account balance	-2,079	-717	-122	-2,850	-4,539	-4,833
As percent of GDP	-2.1	-0.8	-0.1	-2.5	-3.7	-4.0
Capital account balance 1/	2,809	4,400	6,902	3,162	8,658	112
Private capital	2,894	1,616	3,787	2,342	7,216	-4,370
Long-term	2,487	1,983	3,439	3,930	7,560	-1,500
Entrepreneurial 2/	1,672	1,637	2,125	3,731	4,844	2,625
Real estate	1,082	946	956	1,040	1,044	960
Banks	22	32	29	6	6	-7
Suppliers' credits 3/	-2	-14	-19	0	0	0
Other	-287	-618	348	-847	1,666	-5,078
Short-term	407	-367	348	-1,590	-344	-2,869
Banks	-24	46	60	-2,116	-603	-3,338
Of which: Foreign exchange deposits	-24	46	60	-2,173	-686	-3,400
Suppliers' credits 3/	431	-413	288	527	259	469
Official capital	-85	2,787	3,116	820	1,441	2,877
Long-term	-15	2,341	2,337	-25	4,431	1,652
Bank of Greece	1,463	2,587	-1,791	-2,385	-2,194	-2,570
Central government	-1,492	-145	3,830	2,596	6,519	5,245
Public enterprises	64	-39	103	-190	-154	-979
Other 4/	-50	-62	195	-46	259	-44
Short-term	-70	446	779	845	-2,990	1,225
Bank of Greece	186	-420	0	0	0	974
Central government	-281	1,028	873	845	-2,990	251
Other	25	-162	-94	0	0	0
Errors and omissions	-922	-663	-415	-342	78	177
Overall balance	-192	3,020	6,367	-30	4,196	-4,544
Financing items:						
Use of IMF credit	0	0	0	0	0	0
Change in clearing accounts	3	-4	0	0	0	-6
Change in reserves (+: decrease/-: increase)	456	-3,106	-6,738	-304	-3,442	-5,840
Allocation of SDRs	0	0	0	0	0	0
Changes in the valuation of official gold (+:decrease)	-264	88	372	334	-754	-1,302
Stock of reserves (IFS)	5,540	8,647	15,432	15,736	19,177	13,777

Sources: Bank of Greece, *Monthly Statistical Bulletin*; data provided by the authorities; and *International Financial Statistics.*

1/ Private and official capital, excluding errors and omissions.

2/ Includes direct investment and enterprise borrowing abroad.

3/ Includes official suppliers' credits.

4/ Borrowing by the Hellenic Industrial Development Bank, the Agricultural Bank of Greece, and the National Mortgage Bank of Greece.

Table 43. Greece: External Services and Transfers

(In millions of U.S. dollars)

	1994			1995			1996			1997		
	Receipts	Payments	Balance	Receipts	Payments	Balance	Receipts	Payments	Balance	Receipts	Payments	Balance
Services	11,804	5,338	6,466	12,731	6,445	6,286	12,391	6,586	5,805	12,419	6,500	5,919
Transportation	1,957	314	1,643	2,190	422	1,768	2,204	431	1,833	2,104	392	1,712
Travel	3,905	1,125	2,780	4,136	1,323	2,813	3,723	1,210	2,513	3,771	1,325	2,446
Investment income	789	2,101	-1,312	1,008	2,683	-1,675	971	3,003	-2,032	962	2,482	-1,520
Interest	744	1,985	-1,241	986	2,489	-1,503	909	2,818	-1,909	929	2,371	-1,442
Dividends and profits	45	116	-71	22	194	-172	62	185	-123	33	111	-78
Convertible drachma account	2,640	0	2,640	2,810	0	2,810	3,000	0	-3,006	3,060	0	3,060
Other, including government	2,513	1,826	715	2,587	2,049	570	2,427	1,943	484	2,522	2,301	221
Unrequited transfers	6,964	28	6,936	8,038	31	8,007	8,053	31	8,022	7,546	27	7,519
Private	2,657	28	2,629	3,071	31	3,039	2,996	31	2,965	2,924	27	2,897
Emigrant remittances	2,576	0	2,576	2,982	0	2,982	2,894	0	2,894	2,824	0	2,824
Other	81	28	53	89	31	58	102	31	71	100	27	73
Public 1/	4,307	0	4,307	4,968	0	4,968	5,057	0	5,057	4,622	0	4,622
Total services and transfers	18,768	5,366	13,402	20,769	6,476	14,293	20,444	6,618	13,826	19,965	6,527	13,438

Source: Bank of Greece.

1/ Receipts reflect net EU transfers.

Table 44. Greece: External Current Account Deficit and Financing

(In percent of GDP, settlement basis)

	1992	1993	1994	1995	1996	1997
Trade balance	-14.2	-13.7	-13.8	-14.9	-14.9	-15.1
Non-oil balance	-12.5	-12.1	-12.4	-13.5	-13.2	-13.3
Exports, f.o.b.	5.5	4.9	4.7	4.6	4.1	3.9
Imports, c.i.f.	18.0	17.0	17.2	18.1	17.3	17.2
Oil balance	-1.7	-1.5	-1.4	-1.5	-1.8	-1.8
Invisible balance	12.1	12.9	13.7	12.5	11.3	11.1
Invisible receipts	17.6	18.5	19.2	18.2	16.6	16.5
Travel	3.3	3.6	4.0	3.6	3.0	3.1
EU transfers (net)	4.2	4.4	4.4	4.3	4.1	3.8
Other	10.1	10.4	10.8	10.2	9.5	9.6
Invisible payments	5.6	5.6	5.5	5.7	5.4	5.4
Of which: Interest and dividends	2.4	2.3	2.1	2.3	2.4	2.0
Current account balance	-2.1	-0.8	-0.1	-2.5	-3.7	-4.0
Financing:						
Non-debt capital	2.5	2.2	3.6	1.6	5.7	-4.0
Decrease in reserves	0.5	-3.4	-6.9	-0.3	-2.8	4.8
Debt financing, net 1/	-0.8	2.0	3.4	1.2	0.9	3.2
Memorandum items:						
GDP (drachma)	18,678.0	21,106.0	23,984.0	26,895.0	29,861.0	33,026.0
Dr/US$ exchange rate (period average)	190.6	229.3	242.6	231.7	240.7	273.1
GDP(millions of US$)	97,986.0	92,066.0	98,862.3	116,096.9	124,053.8	120,930.1

Sources: Bank of Greece; and IMF, *International Financial Statistics.*

1/ Including residual items.

Table 45. Greece: Current Account of the Balance of Payments 1/

(In millions of U.S. dollars)

	1992	1993	1994	1995	1996	1997
Exports of goods 2/	11,055.5	9,186.0	9,816.6	11,455.6	11,572.9	11,119.6
Imports of goods 2/	24,152.8	21,558.2	21,596.9	25,723.1	26,729.5	25,470.4
Trade balance	-13,097.3	-12,372.2	-11,780.3	-14,267.5	-15,156.6	-14,350.8
Percent of GDP	-13.4	-13.4	-11.9	-12.3	-12.2	-11.9
Exports of nonfactor services	5,598.0	5,450.0	6,275.8	6,864.3	7,234.7	7,213.1
Imports of nonfactor services	1,968.3	1,890.5	2,134.4	2,416.8	2,502.3	2,544.9
Balance of nonfactor services	3,629.7	3,559.5	4,141.4	4,447.5	4,732.4	4,668.2
Percent of GDP	3.7	3.9	4.2	3.8	3.8	3.9
Net factor income from abroad	1,310.5	601.1	856.6	743.1	304.9	256.4
Net private transfers	3,509.6	3,145.5	3,189.2	4,064.1	4,063.1	3,845.3
Net official transfers	2,671.3	2,708.8	2,858.2	2,610.2	2,840.0	2,656.2
Of which: EU transfers 3/	2,193.4	2,383.4	2,427.5	2,429.3	2,940.2	2,636.8
Balance of factor income and transfers	7,491.4	6,455.4	6,904.0	7,417.4	7,208.0	6,757.9
Percent of GDP	7.6	7.0	7.0	6.4	5.8	5.6
Current account balance	-1,976.2	-2,357.3	-734.9	-2,402.6	-3,216.2	-2,924.7
Percent of GDP	-2.0	-2.6	-0.7	-2.1	-2.6	-2.4
Balance of factor income and transfers (including all PIP transfers) 4/	8,448.8	7,642.3	8,092.2	8,807.0	9,484.9	9,321.5
Percent of GDP	8.6	8.3	8.2	7.6	7.6	7.7
Current account balance (including all PIP transfers)	-1,018.8	-1,170.4	453.3	-1,013.0	-939.3	-361.1
Percent of GDP	-1.0	-1.3	0.5	-0.9	-0.8	-0.3
Memorandum items:						
Current account excluding EU transfers	-4,169.6	-4,740.7	-3,162.4	-4,831.9	-6,156.4	-5,561.5
Percent of GDP	-4.3	-5.1	-3.2	-4.2	-5.0	-4.6
Total EU transfers (BoG)	4,058.0	4,085.0	4,307.0	4,968.0	5,057.0	4,622.0
Percent of GDP	4.1	4.4	4.4	4.3	4.1	3.8
Total EU transfers (Budget)	4,277.0	4,594.0	4,586.0	4,649.0	5,877.0	4,701.0
Percent of GDP	4.4	5.0	4.6	4.0	4.7	3.9
Total transfers to PIP 4/	957.4	1,186.9	1,188.2	1,389.6	2,276.9	2,563.6
Percent of GDP	1.0	1.3	1.2	1.2	1.8	2.1

Source: Ministry of National Economy.

1/ National accounts presentation. Converted into U.S. dollars using the annual average exchange rate.
2/ Figures for 1996 are estimates based on January to October customs data.
3/ Excludes official EU transfers to the public investment program.
4/ PIP: Public Investment Program.

Table 46. Greece: Selected Indicators for Trading Partners 1/

(Annual changes, in percent)

	1992	1993	1994	1995	1996	1997
Output and demand in partner countries (Export-weighted market growth) 2/						
Real GDP 3/	0.6	0.4	2.5	2.9	2.0 #	1.9
Real total domestic demand 4/	1.5	-1.3	2.8	2.4	1.5	2.3
Volume of merchandise imports 3/						
Total	12.6	1.8	5.9	10.9	4.6	7.5
Non-oil	13.8	2.5	6.3	11.6	5.6	7.9
Costs and prices of partner suppliers (Import-weighted) 5/						
Unadjusted for exchange rate changes 6/						
GDP deflators 4/	4.1	3.5	2.6	2.9	2.5	1.8
Consumer prices 4/	4.2	3.6	3.0	3.0	2.6	1.9
In U.S. dollar terms						
GDP deflators 4/	7.5	-7.4	3.5	10.3	1.1	-8.1
Consumer prices 4/	7.6	-7.3	3.9	10.5	1.2	-8.0
Export unit values 3/						
Total	3.0	-7.5	2.6	10.9	0.5	-8.1
Non-oil	3.7	-7.0	3.4	11.0	-0.8	-7.9
Costs and prices of industrial trading partners (Export weighted, in U.S. dollar terms) 2/ 4/						
Export unit values	3.2	-8.2	2.0	11.7	-0.7	-9.4
Unit labor costs	6.5	-8.9	-3.0	7.1	0.6	-10.2
World market prices for non-fuel commodities 7/ (in U.S. dollar terms)						
Weighted by:						
Commodity composition of Greek exports	-5.0	-7.4	16.4	11.5	-5.4	4.2
Commodity composition of Greek imports	-3.0	5.1	4.1	-0.3	-0.8	-1.1

Source: IMF, *International Financial Statistics*.

1/ Except for non-fuel commodity prices (see footnote 7 below), these composites are averages of percentage changes of data for each trading partner (as specified in footnotes 3 and 4 below) weighted by their share in exports or imports, as appropriate, of Greece

2/ Weights are proportional to 1992 exports of Greece to partner countries as specified in footnotes 3 and 4 below.

3/ Based on data for partner countries that together account for at least 95 percent of exports or imports, as appropriate, of Greece.

4/ Based on data for industrial partner countries only.

5/ Weights are proportional to 1992 imports of Greece from partner countries as specified in footnotes 3 and 4 above.

6/ That is, weighted averages of percentage changes in indices expressed in national currencies of industrial partner countries.

7/ Based on averages of world market prices for component non-fuel commodities weighted by the 1979–1 composition of commodity trade (exports and imports) of Greece.

Table 47. Greece: Capital Account

(In millions of U.S. dollars)

	1992	1993	1994	1995	1996	1997
Nondebt capital flows	2,443	2,011	3,489	1,808	6,952	-4,832
Enterpreneurial capital 1/	1,672	1,637	2,125	3,731	4,844	2,625
Real estate investment	1,082	946	956	1,040	1,044	960
Deposits with credit institutions	-24	46	60	-2,117	-603	-3,338
Other private capital flows	-287	-618	348	-847	1,666	-5,078
Debt financing	365	2,389	3,415	1,353	1,706	4,946
Medium- and long-term	-276	3,386	3,221	726	4,437	3,253
Bank of Greece, net	1,463	2,587	-1,791	-2,384	-2,194	-2,570
Disbursements	2,912	3,915	0	0	0	0
Amortization	1,449	1,328	1,791	2,384	2,194	2,570
Central government, net	-1,773	883	4,703	3,440	6,519	6,850
Disbursements	1,437	3,446	7,930	7,713	9,755	9,517
Amortization	3,210	2,563	3,227	4,273	3,236	2,667
Public enterprises, net	64	-40	102	-109	-153	-979
Disbursements	622	625	795	623	554	308
Amortization	558	665	693	813	708	1,286
State credit institutions, net 2/	-50	-62	195	-46	259	-44
Disbursements	31	7	258	0	318	0
Amortization	81	69	63	46	59	44
Commercial banks, net	22	32	31	6	6	-5
Disbursements	71	66	46	28	26	15
Amortization	49	34	15	23	21	20
Suppliers' credit	-2	-14	-19	0	0	0
Short-term	360	33	1,067	1,372	-2,731	1,693
Bank of Greece	186	-420	0	0	0	974
Central government	-281	1,028	873	845	-2,990	251
Suppliers' credit	430	-413	288	527	259	469
Public enterprises	25	-163	-94	0	0	0
Errors and omissions	-922	-663	-415	-342	78	177
Memorandum items:						
Current account balance	-2,078	-716	-122	-2,850	-4,539	-4,834
Public sector gross borrowing 3/	4,090	5,765	5,795	4,732	10,627	9,824
Public sector net borrowing 3/	-23	329	2,339	-25	4,431	3,258

Source: Bank of Greece.

1/ Includes some debt-creating capital flows in the form of enterprise borrowing abroad.

2/ Borrowing by the Helenic Industrial Development Bank, the Agricultural Bank of Greece, and the National Bank of Greece.

3/ Medium- and long-term only.

Table 48. Greece: General Government External Debt 1/

(In millions of U.S. dollars; end of period)

	1992	1993	1994	1995	1996	1997
Portfolio investment	7,474.9	11,755.7	16,131.8	18,063.4	19,736.1	21,832.2
Bonds	7,191.7	10,469.0	14,020.2	15,073.6	19,736.1	21,581.9
Of which: domestic market issues	703.8	679.9	612.4	320.2	2,515.0	2,210.0
Money market instruments 2/	283.2	1,286.7	2,111.6	2,989.8	0.0	250.3
Loans	9,574.1	8,162.8	8,638.1	8,644.5	7,603.9	6,688.6
Long-term	9,402.9	8,003.8	8,478.1	8,484.5	7,443.9	6,528.6
Central government	9,356.4	7,967.4	8,446.3	8,457.0	7,431.2	6,528.6
Local government	46.5	36.4	31.8	27.5	12.7	0.0
Suppliers' credits	171.2	159.0	160.0	160.0	160.0	160.0
Military debt	2,799.4	3,029.3	3,504.7	3,880.8	3,440.0	3,106.6
Total debt	19,848.4	22,947.8	28,274.6	30,588.7	30,780.0	31,627.4
(in percent of GDP)	20.2	24.9	28.6	26.3	24.8	26.1
Distribution by creditor						
Official creditors	4,363.2	3,553.8	4,127.7	4,722.1	3,865.8	3,589.7
International institutions	3,233.3	2,077.0	2,766.9	2,478.4	1,677.1	1,372.7
Governments	84.0	102.5	89.7	78.7	43.2	35.2
European Investment Bank	1,045.9	1,374.3	1,271.1	2,165.0	2,145.5	2,181.8
Private creditors	12,685.8	16,364.7	20,642.2	21,985.8	23,474.2	24,931.1
Bank loans	4,887.7	4,350.0	4,350.4	3,762.4	3,578.1	2,938.9
Bonds	7,474.9	11,755.7	16,131.8	18,063.4	19,736.1	21,832.2
Other	323.2	259.0	160.0	160.0	160.0	160.0
Total debt	17,049.0	19,918.5	24,769.9	26,707.9	27,340.0	28,520.8
Memorandum item:						
Private/total debt	74.4	82.2	83.3	82.3	85.9	87.4

Sources: Bank of Greece; and Ministry of Finance.

1/ Including external borrowing by the Bank of Greece on behalf of the Central government prior to 1994.
2/ Bonds with maturities of one year or less and treasury bills issued in the domestic market held by residents.
3/ Excluding military debt.

Table 49. Greece: External Debt Service 1/

(In millions of U.S. dollars)

	1992	1993	1994	1995	1996	1997
A Interest payments	2,261.9	1,983.8	1,985.3	2,489.2	2,818.0	2,370.7
Public sector	2,158.5	1,803.3	1,856.5	2,232.7	2,516.6	282.9
Private sector	103.4	180.5	128.8	256.5	301.4	2,087.8
B Amortization	4,528.4	3,815.2	4,102.2	4,756.4	6,195.9	6,566.4
Private nonguaranteed	415.0	378.5	646.7	0.0	0.0	0.0
Public and publicly-guaranteed	4,113.4	3,436.7	3,455.5	4,756.4	6,195.9	6,566.4
C Suppliers' credit 2/	75.7	24.0	22.6	0.3	0.2	0.0
Total (A + B + C)	**6,866.0**	**5,823.0**	**6,110.1**	**8,933.2**	**9,014.1**	**8,937.1**
Memorandum items:						
Debt service ratio 3/	29.5	26.4	25.5	33.7	34.4	35.3
Current account receipts	23,274.2	22,057.4	23,986.1	26,533.2	26,214.0	25,337.7

Source: Bank of Greece.

1/ Excludes private nonguaranteed amortization after 1994.
2/ Medium- and long-term only. Includes both interest and amortization payments.
3/ Debt service (total: A + B + C) in percent of current account receipts.