BANK OF GREECE

Economic Bulletin

BANK OF GREECE

Economic Bulletin

Number 25, August 2005

Contents

Adjusting to the single monetary policy of the ECB*

Nicholas C. Garganas

It is indeed an honour and a pleasure to address such a distinguished audience of academics and practitioners specialised in the field of European economic policies and broader issues linked to the euro.

This meeting is an important event. It takes place at a time of tensions about the impact of the single monetary policy on the euro area and even as some commentators have raised doubts about the sustainability of monetary union.

Europe's single-currency undertaking is perhaps the boldest attempt ever in which a large and diverse group of sovereign states has attempted to reap the efficiency gains of using a common currency. For 300 million Europeans, the euro has created a new monetary reality that few would have thought possible a generation ago. Like most bold undertakings, however, the single currency has had its share of ups and downs. When it was launched in 1999, sceptics were doubtful whether it would be possible to make the euro a stable currency. Yet, the euro —probably the most visible and tangible symbol of this integration process— is now in its seventh year and has been firmly and credibly established as a stable currency.

Today, I want to address a controversial issue — namely, whether a single monetary policy can fit all parties in a supposedly heterogeneous currency area. Since the start of EMU, this question has generated extensive debate, which has recently intensified, reflecting concerns about the increased divergence of growth rates over the past few quarters and uncertainties deriving from the French

and Dutch rejections of the Constitutional Treaty. Before I discuss this matter, allow me to offer the following qualification: my perspective is that of someone from Greece, a small, open economy with a history of very high inflation and enormous fiscal deficits in the 1980s and the first half of the 1990s. The perspectives of other countries might well be focused on features other than those that I am about to discuss.

EMU from an optimum-currency-area perspective

EMU brought unique challenges for monetary policy. Critical observers took the view that a single monetary policy was doomed to failure. This scepticism was supported by arguments of the traditional theory of optimum currency areas, which recommended monetary unification only among economies with flexible markets, free mobility of labour, a centralised fiscal policy, and a limited incidence of asymmetric shocks. Clearly, these conditions did not —and do not— hold for the euro area, which, after all, is characterised by significant rigidities in labour and product markets, the absence of a significant centralised fiscal transfer mechanism, and national economies with unique institutional and economic features, i.e. a set of circumstances that results in a high incidence and impact of asymmetric shocks.

In these circumstances, so the argument goes, such shocks are likely to lead to widening price differentials, so that a common nominal interest rate in the monetary union results in different real interest rates among countries. For member countries with relatively strong domestic demand and a higher-than-average inflation rate, the lower real interest rate fuels domestic demand and national inflation. Conversely, for countries with relatively

weak domestic demand and a lower-than-average inflation rate, the high real interest rates put further downward pressures on domestic demand and inflation. In other words, a one-size monetary policy does not match the needs of all members.

Yet, the foregoing, traditional view of optimum currency areas neglects several important factors. It seeks to identify the characteristics that a country should have prior to joining a monetary union – that is, *ex ante*. We now know, however, that participation in a monetary union may itself induce changes in economic structure and performance, *ex post*, through at least two channels: on the one hand through enhanced credibility and on the other hand through trade and financial integration.

How does the credibility channel work? Especially for countries that have had recent histories of relatively high inflation rates —such as Greece, Italy, Portugal and Spain— a major benefit of participating in EMU has been the credibility gain derived from eliminating the inflation bias of discretionary monetary policy. With low and stable inflation and inflation expectations, nominal interest-rate differentials between these countries and countries with histories of relatively low inflation rates, such as Germany, have almost been eliminated. At the same time, among the countries participating in the monetary union, neither the risk of currency devaluations nor the corresponding rate premium exist any more. With lower nominal interest rates in traditionally high-inflation countries, the cost of servicing public-sector debt is reduced, facilitating fiscal adjustment and freeing resources for other uses. Moreover, with low and stable inflation, economic horizons lengthen, encouraging a transformation of the financial sector. The lengthening of horizons and the reduc-

tion of interest rates stimulate private investment and risk taking, fostering faster growth.

For Greece, entering the euro area has meant not only the loss of an independent monetary policy, the fruits of which were amply demonstrated in the 1980s and the early 1990s, but also the credibility gains associated with a stable, low-inflation monetary regime. In the 15 years until 1994 —the year in which Greece's efforts to qualify for euro-area entry began in earnest— inflation averaged almost 20%, while real growth averaged less than 1%. In contrast, during the past 6 years, real growth has averaged more than 4%, while inflation has been slightly above 3%. Another way to infer the credibility gains is by looking at interest-rate spreads. In 1997, the year in which a 10-year government bond was first issued in the Greek financial market, the yield differential between that bond and the comparable German bond was 412 basis points. Today, this spread stands at only 24 basis points. I suggest, therefore, that giving up a nationally-tailored monetary policy has not, in fact, been a cost, but a benefit.

Now let me turn to the second channel through which an economy benefits from participating in a monetary union: that of trade. Recent empirical work has shown that a common currency can promote trade and growth over and above any effect produced by separate currencies tied together with fixed exchange rates. For the euro area, the evidence suggests that the adoption of the euro has already increased trade among EMU members by between 4% and 16% compared with trade among European countries that have not adopted the euro. Increased trade integration leads to more-highly-correlated business cycles because of common demand shocks and greater

intra-industry trade, reducing the need for country-specific monetary policies.

There are additional reasons for which a monetary union reduces the incidence of country-specific shocks. One of the principal causes of asymmetric shocks —the effects of divergent monetary policies— no longer exists. Furthermore, it is to be expected that the deepening of financial-market integration will also entail a convergence in the transmission mechanism of monetary impulses. Finally, the common currency helps to increase price transparency and, therefore, competition in goods, services and factor markets, leading to a further alignment of economic cycles.

Inflation differentials

However, the fact remains that there are inflation differentials among the members of the euro area, and a question arises as to how significant they are and how concerned we should be. Recent evidence provided by the ECB shows that, over the period 1990-1999, the 12 countries now comprising the euro area experienced a downward trend in the degree of inflation dispersion —measured as the standard deviation of this dispersion— from about 6 percentage points in the early 1990s to a low of less than one percentage point in the second half of 1999. Since that time, inflation dispersion has changed very little – that is, it remains less than one percentage point. To provide a basis of comparison, since 1999 inflation dispersion across the euro area has fluctuated close to the level observed across the 14 Metropolitan Statistical Areas of the United States. Remarkably, the process of nominal convergence in the euro area was not accompanied by greater dispersion of real GDP growth rates, which has remained close to its

historical average (of around 2 percentage points) following the adoption of the euro.

Inflation differentials in a monetary union provide useful evidence regarding supply and demand conditions in individual areas, facilitating the required adjustments of potential imbalances. Thus, inflation differentials are an important factor for planning the adjustment mechanism. However, between inflation differentials in the euro area and those in the United States there is one notable difference: Although inflation differentials in the euro area have not widened, they have exhibited a relatively high degree of persistence, higher than that experienced across the 14 Metropolitan Statistical Areas of the United States. Seven of the 12 euro area economies have recorded annual inflation rates that have remained either persistently above or persistently below the euro area average since 1999. One of these countries is Greece, where inflation has persistently exceeded the euro area average by about 1.5 percentage points since Greece became a member of the euro area in 2001.

Several factors have contributed to the persistence of inflation differentials across euro area economies. In relatively low-income countries, such as Greece, one factor is the so called Balassa-Samuelson effect, according to which long-term differentials in regional inflation are attributable to differences in the rate at which productivity increases in the various regions' tradable and non-tradable goods sectors. Apart from being difficult to quantify with precision, this effect provides only a partial explanation for the persistent inflation differentials that exist in the euro area. In any case, this effect is a transitory one and part of what I have called "the adjustment mechanism" – in this case, adjustment to a higher standard of living.

But there are other factors contributing to the inflation differentials within the euro area, not so benign as the Balassa-Samuelson effect, including misaligned fiscal policies, wage dynamics not linked to productivity developments, and structural inefficiencies such as rigidities in product and factor markets. Redressing these problems, as you know, is not within the domain of monetary policy. National economic policies are the relevant instruments to enhance the ability of individual countries to respond to economic shocks and to national divergences. I believe that EMU has helped stimulate reforms in the euro area. Major reforms are already undoing the rigidities accumulated over decades, preparing social institutions for the looming demographic changes and making the euro area increasingly competitive internationally. It is crucial to continue strengthening competition in labour and product markets, for example, through liberalisation and deregulation, to improve the efficiency of price signals. National fiscal policies also provide important instruments. They can react to shocks in such a way as to counteract the emergence of differentials. However, sound public finances are an essential element of price stability and are necessary if automatic stabilisers are to work fully without the risk of excessively high deficits. In this respect it is important that governments strive to achieve balanced budgets or surpluses in periods of favourable economic activity.

What difference would such changes make? I previously referred to the relatively low dispersion of real growth rates in the euro area, which is, in fact, of an order of magnitude near that existing among regions of the United States. The dispersion among US regions, however, is centred around a higher average growth rate. Since 1999,

the US economy —which is more flexible than that of the euro area— has grown at an average rate of about 3.1%, compared with about 1.9% on average in the euro area.

Although a number of reforms have been implemented since the start of EMU, clearly the euro area is anything but an optimum currency area, in the traditional sense of the term – i.e. judging by factor mobility, market flexibility and fiscal policy centralisation. It is therefore important that national labour market policies enhance flexibility at the national and regional levels. Structural policies should also aim at improving the efficiency of the wage and price setting mechanism to reduce the persistence of inflation divergence. In this connection, I should note that in some countries, such as Greece, wage behaviour has not fully adapted to the new regime.

Conclusions

Let me conclude with the following thoughts. Recent events have given rise to some populist rhetoric about the wisdom of a single currency within Europe. A few commentators have posed the question: Why have a monetary union in Europe? My perspective is very different. I share the sentiment of my colleagues on the Governing Council who have dismissed as "absurd" the speculation that the euro area's future has been thrown into doubt. Thus far, our single-size monetary policy has worked extremely well, delivering price stability so that changes in prices convey more effective information about demand and supply conditions.

The credibility of the ECB's monetary policy has delivered to all member countries of the euro area interest rates that are at historically low levels. Yet, price stability and low interest rates are not enough to raise growth and improve living standards. They provide the fabric upon which a more dynamic Europe can be woven. Recent events, in my view, only confirm that a currency union requires more flexibility and a higher level of competition than independent monetary areas do. Flexible markets and strict fiscal rules are not a luxury for members of a monetary union, but necessities that will make monetary union work. In response to those who are asking "Why have a single currency?" allow me to cite some wise words penned by the late Irish playwright, George Bernard Shaw: "Some people," he wrote, "look at things as they are, and ask 'Why?'; I look at things as they might be, and ask 'Why not?'" This, Ladies and Gentlemen, is the way I look at the future of Europe. Why not, indeed?

Indebtedness of Greek households: evidence from a survey*

Theodore M. Mitrakos
Economic Research Department

Georgios Th. Simigiannis
Statistics Department

Panagiota G. Tzamourani
Statistics Department

1. Introduction

During the last five years (2000-2004), the outstanding balance of bank loans to Greek households has been increasing at an average annual rate greater than 30.0% and, although its rates of growth are decelerating, they are still high (2001: 40.4%, 2002: 32.2%, 2003: 27.6%, 2004: 28.5%, May 2005: 27.9%). This development is directly associated with the fact that, when Greece entered EMU in 2001, the key interest rates and required reserve ratios of the Bank of Greece were adjusted to the relevant Eurosystem rates and ratios. These adjustments led to a fall in bank lending rates and a gradual release of considerable liquidity from the country's central bank. This high credit expansion to households also reflects the particularly increased competition among banks in consumer and housing credit.

The sharp rise in bank credit to households has contributed to the high rates of economic growth experienced over the same period, by strengthening consumption and housing investment. On the other hand, however, it has raised concerns about households' ability to service their debts properly. The case of over-indebted households is of primary importance for policy makers, as a spread of this phenomenon would not only have serious consequences for the households in question but could also pose a threat for the soundness and stability of the whole banking system.

The financial position of a particular household cannot be assessed using aggregate statistics. Only data

at household level can reveal how financial pressure is distributed across households and the types of household which are most indebted. In assessing financial pressure, the main concern is households whose indebtedness has reached levels likely to prove a heavy burden. Accordingly, in 2002, the Bank of Greece commissioned a survey to investigate the level of household indebtedness and its relationship to households' income and wealth.

The initial findings of this survey were published in a Bank of Greece report, in March 2003.[1] This article draws a lot on those results but —in contrast to that report— the analysis now takes non-response into account and the data have been weighted accordingly. In addition, it attempts to explore further the relationship between indebtedness status and households' economic and demographic data using logistic regression analysis.

The following section presents the survey, while the third section focuses on the level of indebtedness and the distribution of loans across Greek households. The fourth section investigates how the level of indebtedness is distributed relative to the income and the assets of households and discusses how certain indicators of household financial pressure vary across income and age groups. The fifth section examines the relationship between household indebtedness and certain economic and demographic characteristics. Finally, the sixth section concludes.

2. Statistical data

The survey was carried out between late September 2002 and late January 2003 on a large nationwide sample of 6,007 households —all

respondents were the members of these households aged 25 and over— from all urban and semi-urban areas, together representing about 80% of the country's population.[2] A random sampling technique, stratified by geographical district, was used to ensure that the sample is representative of the surveyed populations, while the relevant questionnaire attempted to shed light on the principal economic and social parameters of household borrowing.

Through the survey, 2,303 "full" household responses were collected ("full" meaning that all eligible members of a particular household completed the relevant questionnaires) giving 6,750 members in total. It should be noted that the response rate varies across geographical areas, with the lowest rate recorded in Athens and the highest in semi-urban areas. As a result, the representation of geographical areas in the sample of "fully" responding households is not exactly proportional to their respective population.[3] To some extent, this affects the representativeness of the total surveyed population in the sample, a crucial factor when assessing the results. Therefore, appropriate weights were applied to the data in order to account for the different response rates among geographical areas and to balance out the effects of overall non-response. The relevant weights were estimated so that the sample distri-

---

1 See Bank of Greece, *Monetary Policy 2002-2003*, March 2003, pp. 88-96.
2 Rural areas (villages or towns with less than 2,000 inhabitants) and islands (other than Crete) were not covered in the sample, since recourse to credit was expected to be low and it would not have been cost-effective to include these areas in the sample.
3 Differences in the response rates were observed between the two large cities, other urban and semi-urban areas: "other" urban and semi-urban areas are over-represented at the expense of Athens, while the share of Thessaloniki (the second largest Greek city) is exactly proportional to its population.

butions of responses by geographical area and household size matched those of the latest population census (2001). Additionally, the results of the survey were compared with information available from macroeconomic data in order to test their consistency and reliability.

3. The level of household indebtedness and the distribution of loans

Table 1 presents[4] the number of indebted households and their average debt across different loan categories. Out of the 2,303 households responding in the survey, 51.6%[5] reported that they do not have any outstanding debt from any bank or non-bank loan. Thus, Greek households' recourse to borrowing for financing their needs seems to be less widespread than might be suggested by the rapid growth of bank loans to households and the well advertised instalment payment schemes offered by retail firms, particularly since the late 1990s. The remaining 48.4% of the households have outstanding loan debts. On average, each of them owes €14,850. This is equivalent to an average outstanding debt of about €7,200 per household in the sample. This outcome is not too far from the estimate of €7,700,[6] which is derived from macroeconomic data (i.e. the aggregate outstanding balance of bank loans to households is divided by the total number of households).[7] However, the distribution of this balance is very asymmetric (positive asymmetry), since 74.2% of indebted households have an aggregate outstanding debt of less than the total mean.[8]

The most widespread form of household borrowing is through credit cards, as around half (53.1%) of the households with outstanding loan debts

reported borrowing through credit cards (see Table 1, third column). On average, the outstanding amount owed per household is €1,701. The second most widespread form of borrowing is housing-related loans, which include loans for house purchase, house repair and land acquisition. Specifically, 37.2% of the indebted households have such housing loans,[9] each of them owing about €29,557 on average. "Other" —typically unsecured— bank loans follow (29.4%), and then come loans for car purchase (20.9%), for which the average outstanding amount per household stands at €2,979 and €5,815 respectively. Finally, 16.3% of the indebted households report a debt obligation to retail firms.

Indebtedness by regional and demographic characteristics

The level of indebtedness differs considerably between geographical areas, as shown in Table 2. Athens exhibits the highest percentage of house-

---

4 The data source for all the tables and charts of this article are own calculations based on the initial results of the household indebtedness survey commissioned by the Bank of Greece and conducted by TNS-ICAP S.A. between September 2002 and January 2003.

5 Figures are slightly different from those appearing in the Bank of Greece *Monetary Policy 2002-2003* Report, because of the revision of the survey weights. More specifically, as the weighting of households with only one member has increased, the percentage of households in debt (48.4%) is now somewhat lower than the percentage presented in the above report (50.2%).

6 The difference between the two figures stems mainly from the fact that the survey gives a lower average for non-housing loans as compared to the one derived using aggregate (macroeconomic) data, whereas the housing loan averages estimated from the survey and from aggregate data are very close.

7 At the end of the third quarter of 2002, the outstanding balance of total bank loans to households was €29.2 billion, while the total number of households nationwide is estimated to be 3.8 million.

8 The median of the outstanding debt distribution is 3.7 times less than the mean value, while the value of skewness is 4.5. These values indicate a departure from symmetry with a long right tail.

9 Throughout this article, housing loans refer to loans for house purchase, house repair and land acquisition.

Table 1

Households and average debt by loan category

Loan category	Households (%) in the sample*	Indebted households (%)*	Average debt (in euro)
Housing-related loans	18.0	37.2	29,557
Loans for house purchase	13.3	27.5	33,187
Loans for house repair	5.2	10.7	16,877
Loans for land acquisition	0.5	1.0	7,430
Other loans	41.3	85.3	4,246
Loans for car purchase	10.1	20.9	5,815
Unsecured bank loans	14.2	29.4	2,979
Credit card debt	25.7	53.1	1,701
Credit from retailers	7.9	16.3	1,294
Loans from individuals	1.3	2.8	12,447
With some debt obligations	48.4	100.0	14,850
Number of households (N)	2,303		

* The percentages do not add up to 100% because some households have more than one debt obligation (e.g. they may have taken both a mortgage and a consumer loan).

Table 2

Indebted households across geographical areas

(Percentages)*

Loan category	Athens	Thessaloniki	Other urban areas	Semi-urban areas
Housing-related loans	19.2	17.5	19.6	12.7
Loans for house purchase	14.2	14.1	15.0	7.8
Loans for house repair	5.8	4.1	4.6	5.0
Loans for land acquisition	0.6	0.0	0.8	0.2
Other loans	47.9	41.5	38.6	28.3
Loans for car purchase	11.1	13.2	9.3	6.7
Unsecured bank loans	15.5	15.0	15.1	9.0
Credit card debt	34.1	22.2	21.3	13.2
Credit from retailers	8.9	7.2	7.0	7.3
Loans from individuals	1.5	2.0	1.0	1.2
With some debt obligations	54.5	50.2	46.7	34.1

* The percentages do not add up to 100% because some households have more than one debt obligation (e.g. they may have taken both a mortgage and a consumer loan).

holds with some kind of debt (54.5%); this falls to 50.2% for Thessaloniki and drops further to 46.7% for "other" towns and to 34.1% for semi-urban areas.

The distribution of loans within each geographical area, i.e. the "popularity" of each type of loan, is quite similar across geographical areas. In semi-urban areas though, the percentage of households

Chart 1
Indebted households (%) by age group
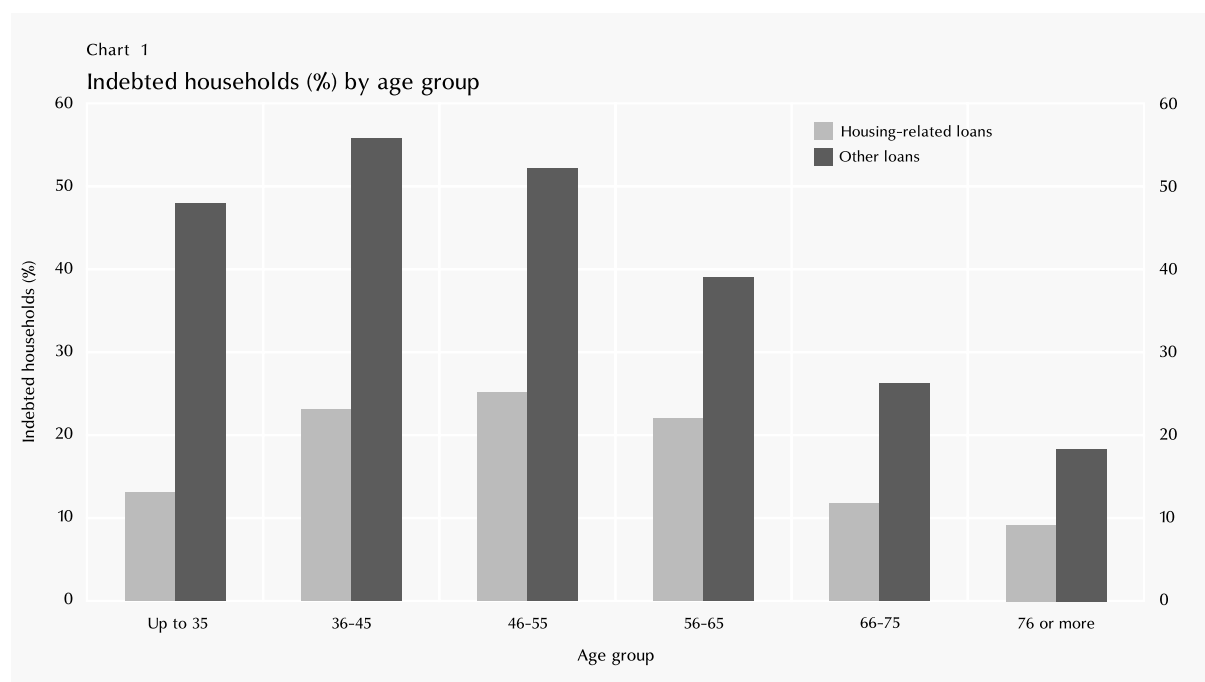
that have recourse to various types of borrowing —excluding loans for house repair— is roughly half that in other areas, especially in Athens and Thessaloniki. This finding may imply a relatively low degree of penetration of the banking system in these areas, in particular as far as the use of credit cards is concerned. On the other hand, the relatively small proportion of households with housing loans in semi-urban areas is consistent with other survey findings pointing to a substantially higher percentage of owner-occupancy in these areas relative to urban areas (Athens in particular). In this case, therefore, it may be mostly due to the relatively weak demand for new dwellings in semi-urban areas rather than the low degree of penetration of the banking system in these areas.

Demographic factors seem to affect the distribution of indebted households and their outstanding debt. Regarding the age of the household head, the percentage of indebted households initially increases with age but soon falls back for households with heads aged over 45 (see Chart 1). In the case of housing-related loans, the distribution peaks at 25.3% for the middle age group ("46-55"), while it is the immediately younger age group ("36-45") that more often has non-housing —usually unsecured— loans. Moreover, for the lowest age group, the difference between housing and non-housing loans is more pronounced and declines with age. Increasing age is usually accompanied by a decrease in borrowing requirements, either because income is sufficient to cover household expenses and/or because people are more conservative towards borrowing.

The increase in housing-related loans for households with children is obvious in Chart 2, which depicts the percentage of these households across different family types. About 33.0%

Chart 2

Chart 2

Indebted households (%) by household composition

Chart 3

Chart 3

Indebted households (%) by education group
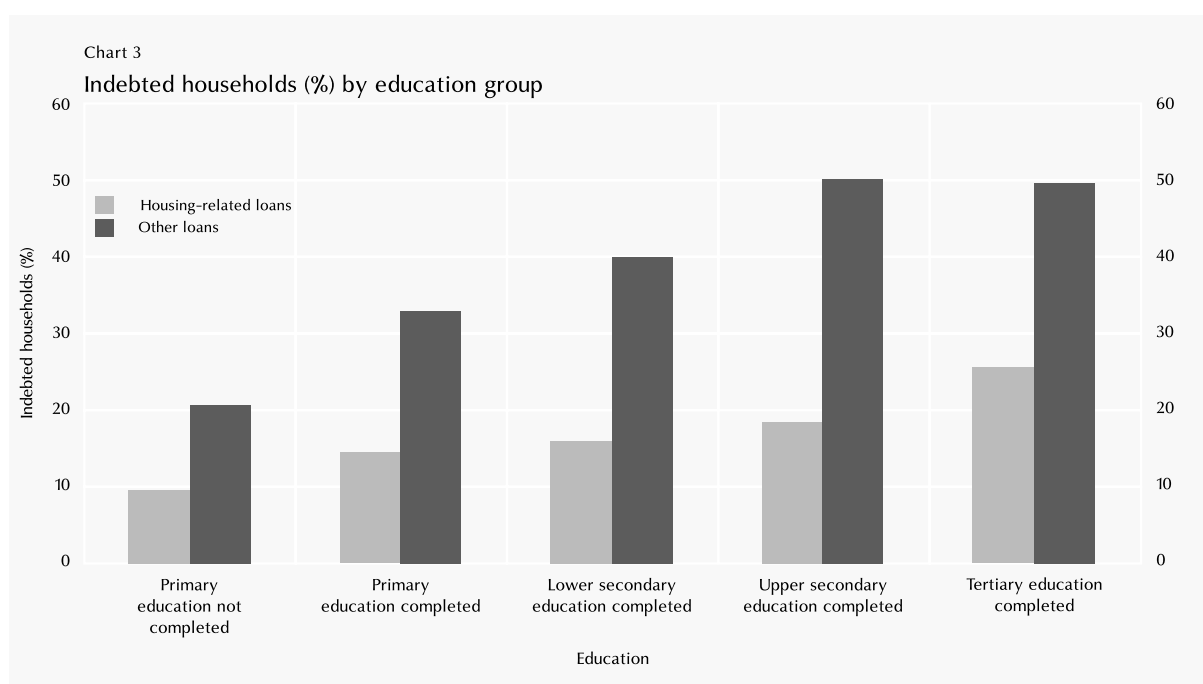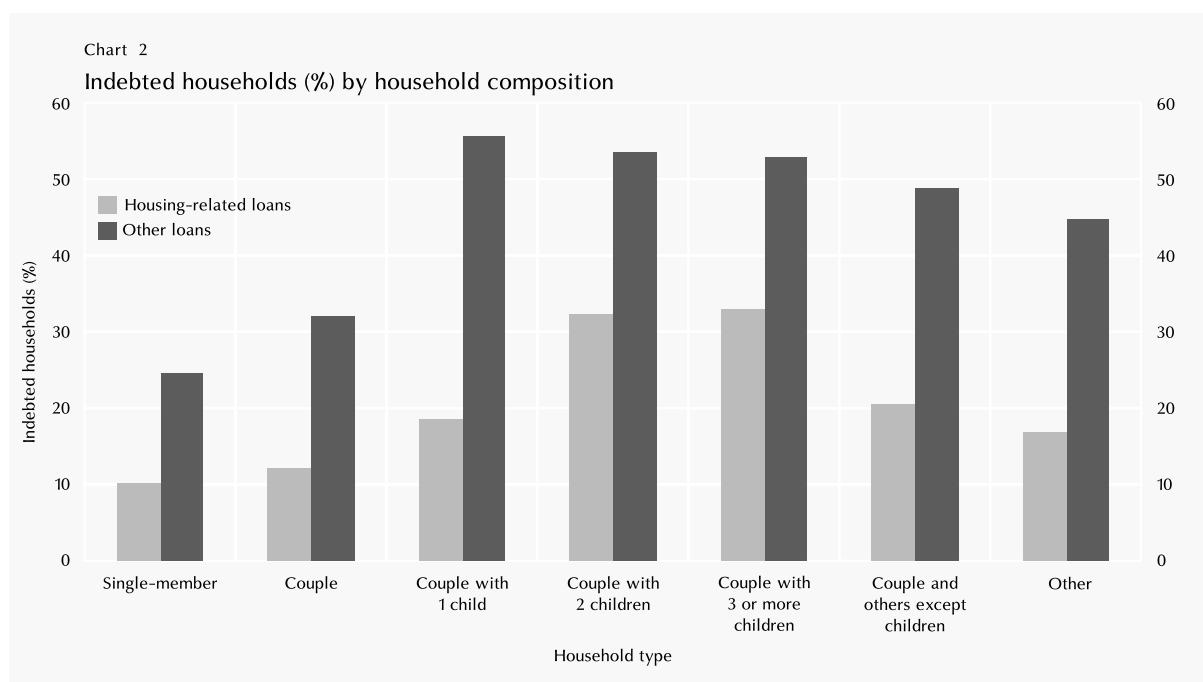
of couples with two or three (or more) children have a housing-related loan, while only 10.2% of single-member households or 12.3% of couples without children have such a loan. By con-

trast, non-housing loans are popular with households with more than two members (couple and others) as much as with couples with children.

Chart 4

Indebted households (%) by employment status
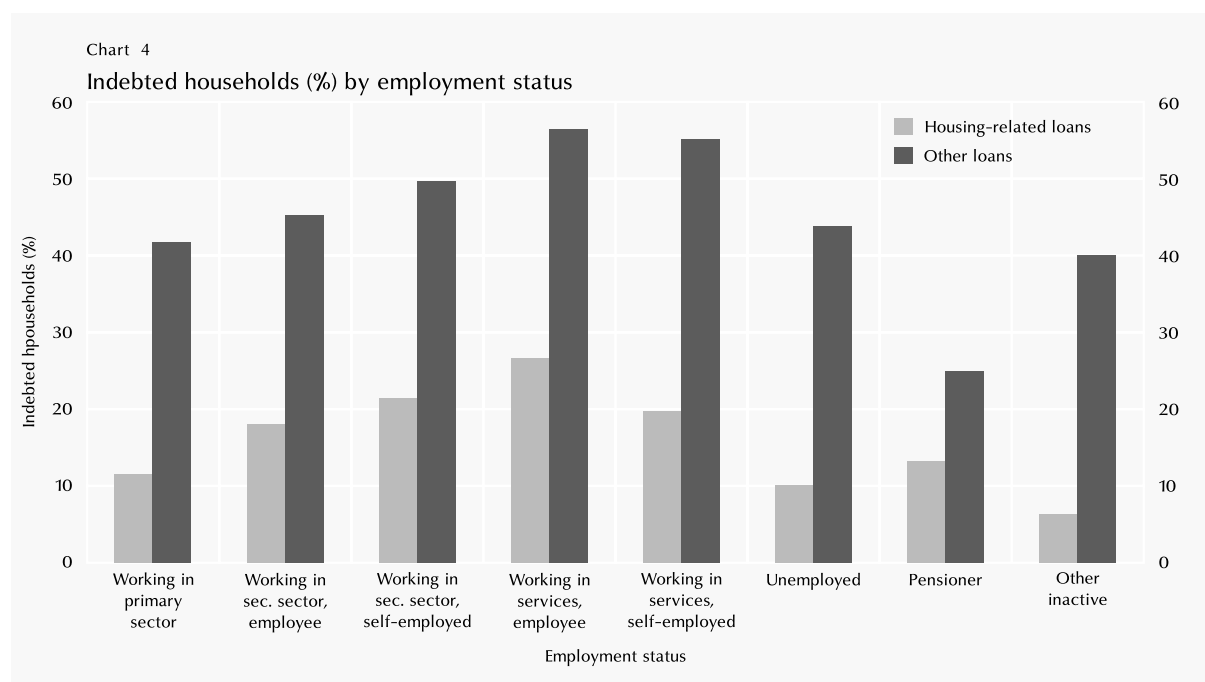
The educational level of the household head seems to play an important role in the household's indebtedness. As Chart 3 shows, there is a positive relation between the rate of indebted households and educational level, particularly for non-housing loans. The rates for housing-related loans range from 9.5%, where the head has not completed primary education, to 25.5% for households where the head is a university graduate (or higher). For non-housing loans the rates range from 20.7% for the lowest education category and reach about 50.0% for both high-school and university graduates. A similar positive relation exists between educational level and the average amount outstanding per household —mainly for housing-related loans— as this outstanding amount stands at €8,165 for the lowest education group and increases continuously to reach €18,587 for the highest education group. The previous findings could be simply reflecting the identified positive correlation between edu-

cation and income level of household (see below), but it may also be the case that higher-educated household heads are better informed and thus perhaps more "open" to the option of taking a loan.

Finally, the employment status of the household head appears to influence the household's indebtedness. As shown in Chart 4, households with an economically inactive (e.g. pensioner) or unemployed head resort more seldom to borrowing, and their average borrowing is relatively low. This is probably due to their rational decisions, but it may also be reflecting the rather narrow possibilities open to these households to get a loan given the rationing and the credit scoring criteria applied by banks. Thus, only 10.1% or 6.4% of households headed by an unemployed or other economically inactive person have some type of housing-related loan, as against about 21.0% of the households with the head in employment.

Similarly, only 23.9% of pensioners resort to some "other" (than housing) type of loan, in contrast to the twice as large percentage of households whose head is in employment. Pensioners may be more risk averse than people in employment. Among indebted households with the head in employment, the percentage of households with the head working in services is larger than in any other sector, particularly the primary sector. This result may reflect the lower degree of bank penetration into the semi-urban regions and the relative uncertainty characterising income prospects in the primary sector, though the level of income is in any case an important factor in determining access to bank lending.[10]

4. Distribution of financial pressure

To assess the financial pressure on households, a comparison of their debt obligations with their income, property and other characteristics is essential. For this purpose, various financial ratios (gross annual debt payments-to-disposable income ratio, outstanding debt-to-income ratio, liquidity ratio, assets-to-liabilities ratio, etc.) have been commonly used by studies in this area, particularly in the last two decades.[11] In this section we first consider the distribution of debt in relation to income and wealth over the sample of households, and then examine how financial ratios like debt-income and debt-service cost vary across different population groups.

4.1 Distribution of indebtedness across income and wealth groups

The proportion of households with outstanding loan debts varies significantly depending on their

(net) income and wealth position. Table 3 shows that 23.6% of low-income households (defined as those with an annual income of up to €7,500) have contracted some kind of loan. The corresponding figure for the second income class (households with annual income in the €7,501-15,000 range) reaches 39.5%, and further increases to 61.1% and 76.5% for households with annual income that is high (in the €15,001-30,000 range) or very high (more than €30,000), respectively. A positive relation also exists between income groups and average outstanding amount of debt per household.

A similar picture emerges if household net property is taken into account (see Table 4).[12] Only 36.0% of households near the bottom end of the wealth distribution have contracted some kind of loans. This percentage increases as wealth builds up and reaches around 64.0% for households owning more than €200,000. These figures imply that recourse to borrowing becomes greater as households' income and wealth increase. Moreover, given that only 1.3% of the sample households reported that they have borrowed from other individuals (usually relatives or friends), it can be inferred that recourse to

---

10 Kohler, Connolly and Smith (2004) have found similar results for Australian households as regards the age, education level and current work status of the household head.

11 Financial ratios, traditionally used in business and industry, were defined for household finances to give an objective picture of the household's financial situation and to help planners, counsellors, etc., to make recommendations to households. Financial ratios have been suggested among others by Griffith (1985), Prather and Hanna (1987), whereas Lytton *et al.* (1991) recommended the use of guidelines with financial ratios. For a discussion of the usefulness of financial ratios as predictors of household insolvency, see DeVaney (1994).

12 Household net property is defined as the total value of household property minus the value of the housing-related loans.

Table 3
Indebted households by income group
(Percentages)*

Loan category	Annual household income (in euro)			
	Up to 7,500	7,501 to 15,000	15,001 to 30,000	Over 30,000
Housing-related loans	5.8	12.3	22.5	39.6
Loans for house purchase	3.6	8.4	17.8	29.2
Loans for house repair	2.2	3.6	6.0	11.7
Loans for land acquisition	0.1	0.4	0.5	1.4
Other loans	19.4	34.1	52.6	64.0
Loans for car purchase	3.0	8.3	13.2	17.3
Unsecured bank loans	6.2	13.2	17.2	21.3
Credit card debt	6.5	18.6	35.1	48.4
Credit from retailers	5.3	6.9	9.4	10.4
Loans from individuals	2.2	1.1	1.3	0.9
With some debt obligations	23.6	39.5	61.1	76.5

* The percentages do not add up to 100% because some households have more than one debt obligation (e.g. they may have both a mortgage and a consumer loan).

Table 4
Indebted households by net property group
(Percentages)*

Loan category	Net household wealth (in euro)			
	Up to 10,000	10,001 to 100,000	100,001 to 200,000	Over 200,000
Housing-related loans	8.2	20.1	20.9	27.3
Loans for house purchase	6.3	15.6	14.8	18.8
Loans for house repair	1.9	5.2	6.7	9.5
Loans for land acquisition	0.3	0.3	0.4	1.0
Other loans	33.0	40.8	46.6	52.8
Loans for car purchase	7.0	11.6	11.1	11.4
Unsecured bank loans	12.4	14.6	15.7	15.7
Credit card debt	18.3	23.6	29.3	40.9
Credit from retailers	8.2	7.8	8.1	7.7
Loans from individuals	1.5	1.6	1.2	0.8
With some debt obligations	36.0	48.9	54.5	64.3

* The percentages do not add up to 100% because some households have more than one debt obligation (e.g. they may have both a mortgage and a consumer loan).

bank borrowing also rises along with income and wealth. Disaggregated data reveal that households with very low income (up to €5,000) and/ or wealth (up to €10,000) have limited —if at all— recourse to bank borrowing, as might be expected.

Table 5
Distribution of debt-to-income ratio by deciles of indebted households

Deciles	All debt-to-income	Housing-related debt-to-income	Other debt-to-income
1st	1.3	1.1	0.9
2nd	3.5	8.1	2.4
3rd	7.3	18.6	4.7
4th	12.4	42.9	7.6
5th	22.8	79.6	11.2
6th	36.1	116.7	18.0
7th	57.5	171.0	25.5
8th	106.1	261.0	37.1
9th	224.0	374.9	61.4
Sample of households	All with debt	All with housing-related debt	All with non-housing debt

4.2 Debt-to-income ratios

The outstanding debt-to-income ratio is a common measure to assess the level of household indebtedness. It is often calculated from aggregate data at country level to compare the levels of household indebtedness between countries. Computed with household level data and for indebted households, this ratio can illuminate the percentage of households possibly at risk of not being able to service properly —and consequently to pay off— their loans. Outstanding debt-to-income may be large for some households without necessarily meaning that these households will have difficulty in servicing their loans, since these may be long-term loans. But it may suggest that these households are more vulnerable to adverse economic and/or financial developments, for example, if a household member falls into unemployment or if the cost of debt servicing rises because of an increase in interest rates.

Table 5 gives the distribution of debt as a percentage of income in the population. The total debt-to-income ratio for the median household owing some kind of debt is 22.8. This is of course higher for housing loan borrowers, for which the median housing loan to income ratio is 79.6. For the households owing other than housing-related loans, the median ratio of "other" loans to income is only 11.2. However, there is a lot of variation in the ratios in the population, as the deciles in Table 5 show. The overall debt-to-income ratio for debt borrowers may exceed 224.0 for households in the most indebted 10% of the sample.[13]

Compared to the UK, Greek households seem to have lower housing-related loan obligations but relatively high "other" debt. Cox, Whitely and Brierley (2002) report the debt-to-income ratio (all debt) for mortgage holders and the unsecured debt-to-income ratio for households with unsecured debt. For mortgage holders, in 2002 the

---

13 These extreme values affect greatly the means of these debt-to-income ratios, making them a lot larger than the medians. In the following analysis the article concentrates on the medians, as they are robust to extreme values. At the same time though, the variability of these ratios is also considered.

Table 6
Indebted households and the debt-to-income ratio by income group

Income group (in euro)	Distribution of indebted households (%)	Contribution to the total sample debt (%)	Average debt (in euro)	Average debt-to-income ratio (%)	Median debt-to-income ratio (%)
a. All households with debt					
Up to 6,000	5.7	2.7	6.965	192.8	48.1
6,001-12,000	16.7	7.6	6,730	72.0	26.5
12,001-18,000	26.0	22.2	12,689	84.1	28.2
18,001-24,000	18.7	20.4	16,162	75.4	22.4
24,001-30,000	13.1	16.3	18,452	67.3	16.4
30,001-45,000	13.0	18.4	20,987	57.7	15.4
45,001-60,000	3.4	6.4	28,078	55.4	19.9
60,001 and over	3.3	6.0	27,107	34.4	8.0
Total	100.0	100.0	14,850	77.7	22.8
b. All households with housing-related loans					
Up to 6,000	4.4	2.3	15,549	424.6	386.0
6,001-12,000	11.5	5.6	14,392	155.8	63.9
12,001-18,000	24.4	21.6	26,233	173.2	123.9
18,001-24,000	19.3	21.1	32,235	149.1	64.6
24,001-30,000	12.7	17.0	39,684	144.5	108.6
30,001-45,000	18.6	20.6	32,546	89.0	60.0
45,001-60,000	5.4	7.3	39,332	77.5	53.9
60,001 and over	3.7	4.6	36,678	49.3	22.8
Total	100.0	100.0	29,557	147.4	79.6
c. All households with other loans (irrespective of whether they also have housing loans)					
Up to 6,000	5.6	3.9	2,978	79.9	47.2
6,001-12,000	17.4	13.9	3,387	35.6	24.1
12,001-18,000	26.2	24.2	3,920	26.2	15.6
18,001-24,000	18.8	18.3	4,127	19.8	9.6
24,001-30,000	12.9	14.1	4,620	16.9	8.5
30,001-45,000	12.1	11.4	3,995	11.3	6.6
45,001-60,000	3.5	3.6	4,448	8.8	4.7
60,001 and over	3.4	10.5	13,337	15.6	2.1
Total	100.0	100.0	4,246	25.5	11.2

median debt-to-income ratio was 142.4 for the UK and only 93.9 for Greece. However, the Greek median other-than-housing debt as a percentage of income is slightly above the equivalent figure for the UK (Greece: 11.2%, UK: 9.8%), though in both cases the medians correspond to relatively small income percentages.

Debt-to-income ratios and income

The survey allows the investigation of the distribution of debt-to-income ratios across income and age groups and the results for income groups are presented in Table 6. In general, all debt-to-income ratios (total, housing and non-

housing debt) are higher for the lower income groups. However, even for the lowest income group (with annual income less than €6,000), the median overall debt-to-income ratio does not exceed 50% of their annual disposable income. Housing debt-to-income ratios are of course higher, but these are secured loans and typically have a long pay-off period. "Other" loans may be more worrisome, as they are usually short-term unsecured loans and, in general, exhibit higher sensitivity to economic volatility. But the corresponding ratios are also low and only those for the lowest income group (median value 47.2) might cause some concern.[14]

Overall, the distribution of debt-to-income ratios indicates that the low-income groups may be more vulnerable to adverse financial conditions. On the other hand, the average debt of the lowest income groups is smaller than the average debt of the higher income groups, and also, the lowest income groups account for a smaller percentage of debt than their contribution to the sample of debt borrowers. For example, the "€6,001-12,000" income group accounts for 7.6% of the total overall debt, whereas the households in this group form 16.7% of the households owing debt. This means that although some households face the grim consequences of not being able to pay off their loans, the consequences for the banks granting these loans will be relatively small. Hence, it may be inferred that households' debt in Greece is limited in relation to their annual income and wealth. This is also in line with the fact that the total Greek household bank borrowing-to-GDP ratio[15] stood at 22.6% in 2002, while the corresponding ratio for the euro area was 46.9%.

Debt-to-income ratios and age

Table 7 presents the distribution of households and debt from different types of loans as a percentage of total income by age group. Average and median debt-to-income ratios are higher for the three youngest groups than for the three oldest groups. The "36-45" age group has the largest mean debt, which falls constantly for the next age groups. The age groups "36-45" and "46-55" are the only ones that contribute more to overall debt than their weight in the sample – particularly true of the "36-45" group, which also has the largest average debt. This seems to be consistent with the life-cycle hypothesis of consumption, i.e. that younger households borrow more in lieu of anticipated future income.[16]

The picture is more clearly defined if we look at housing-related loans alone. The youngest groups have the highest mean and median debt-to-income ratios. Indeed, the two youngest groups are those with the largest mean debt and, furthermore, contribute to the overall housing debt more than their contribution to the population of those who have housing loans. This probably arises from the fact that the youngest households have taken on their loans more recently and so their outstanding debt is much larger than for the older households. Regarding the households that have "other" (than housing) loans (irrespective of whether they also have housing

---

14 A positive relationship between the levels of debt and income is also found by Cox *et al*. (2002) using information from the British Household Panel Surveys (BHPS, 1995 and 2000), which suggests that households with the highest absolute levels of debts (both mortgage and unsecured) also tend to have the highest incomes and net wealth.

15 The balance of bank loans to Greek households is calculated on the basis of data submitted by banks to the Bank of Greece.

16 This relation is also confirmed by the BHPS data used in Cox *et al*. (2002). Total debt-to-income ratios of mortgage-holding households and unsecured debt-to-income ratios were both inversely correlated with the age of the household head in both 1995 and 2000.

Table 7

Indebted households and the debt-to-income ratio by age group

Age group	Distribution of indebted households (%)	Contribution to the total sample debt (%)	Average debt (in euro)	Average debt-to-income ratio (%)	Median debt-to-income ratio (%)
a. All households with debt					
Below 35	15.8	14.2	13,338	79.6	22.8
36-45	26.8	34.8	19,300	101.2	27.3
46-55	22.2	22.8	15,235	85.5	24.2
56-65	17.1	14.4	12,433	63.3	19.3
66-75	11.9	8.7	10,881	46.4	15.0
76 and over	6.2	5.2	12,403	44.1	12.2
Total	100.0	100.0	14,850	77.7	22.8
b. All households with housing-related loans					
Below 35	11.0	13.9	37,050	213.2	170.0
36-45	26.9	37.2	41,049	205.5	128.5
46-55	24.2	22.7	27,788	142.4	82.6
56-65	19.8	13.9	20,805	101.8	30.5
66-75	11.7	6.9	17,366	78.8	34.0
76 and over	6.6	5.4	24,457	73.7	25.7
Total	100.0	100.0	29,557	147.4	79.6
c. All households with other loans (irrespective of whether they also have housing loans)					
Below 35	17.7	15.1	3,622	23.6	12.0
36-45	27.9	27.0	4,111	25.6	12.6
46-55	21.8	23.0	4,464	31.3	10.8
56-65	15.3	16.0	4,428	25.0	12.1
66-75	11.6	14.5	5,316	20.9	7.3
76 and over	5.6	4.4	3,320	19.0	8.5
Total	100.0	100.0	4,246	25.5	11.2

loans), it is the three middle-age groups that have the largest debt levels, i.e. households for which the age of the household head varies between 46 and 75. In addition, the contribution of these households to "other" debt is larger than their contribution to the population of "other debt" holders. Here, the distribution of ("other") debt-to-income ratios against age is rather flat, i.e. it does not indicate significant concentration in any particular age group.

Overall, young households tend to borrow a lot with respect to their income to finance housing needs. The high debt-to-income ratios for these households make them potentially vulnerable if their financial situation changes unexpectedly. As regards "other" loans, households with heads aged 46 years or more tend to borrow more than younger ones to cover other living expenses or to raise their living standards.

4.3 Debt-service costs

Even high debt-to-income ratios may not necessarily mean high financial pressure to service outstand-

Chart 5

Debt service cost to income ratio

Cumulative percentage of indebted households
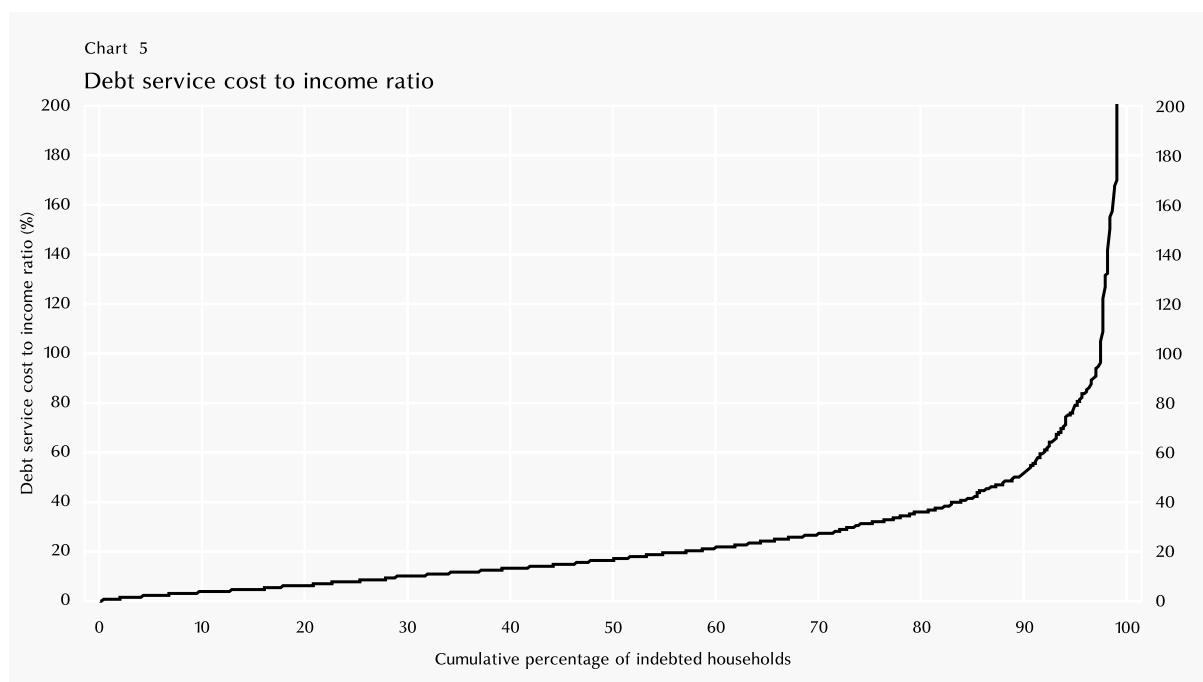
ing debt. The debt service ratio, as defined by the ratio of monthly instalment to monthly income, is more indicative of the extent of immediate financial pressure that debt imposes on a household. Indeed, as a rule, commercial banks use this ratio as a criterion when deciding whether to grant a new loan and it is generally assumed that the debt service ratio should not be much higher than one third.[17]

As Chart 5 shows, for half the sample the monthly debt service payments by households absorb only about 17% of their monthly income. For 77.4% of households the debt service cost is less than one third of their income. For about 10.0% of the households though, the debt service cost exceeds half of their income, while only for 2.6% of the households the monthly payment for servicing their debts is higher than their monthly income. On the whole, these figures indicate that in general the servicing of loans is well within the capacity of households.[18]

The distribution of debt service ratios across income groups shows that the monthly instalment-to-income ratio is —not unexpectedly— high for the lowest income groups (see Chart 6). For the median household in the lowest income category (up to €500 per month) the monthly instalment reaches 48.3% of its income. This is higher than the one third (or 33%) threshold, beyond which it is suggested that debt servicing imposes financial pressure on households of this income group. The mean is higher than the median, as for all income groups, since it is influenced by the large individual values that lie at the

---

[17] According to Garman and Forgue (1991) the ratio of gross annual debt payments (housing and consumer debt) to disposable income should not exceed 40%. Lytton *et al.* (1991) suggest a value between 30% and 35%.

[18] The relation between debt service cost and income is particularly important for renters. The distribution of this ratio for households paying rent is not much different than that for the total of households, but for 20% of those for which the cost exceeds one third of their income the need to pay rent makes the servicing of their debt even more difficult.

Chart 6

Distribution of the debt service ratio across income groups

Chart 7

Distribution of the debt service ratio across age groups
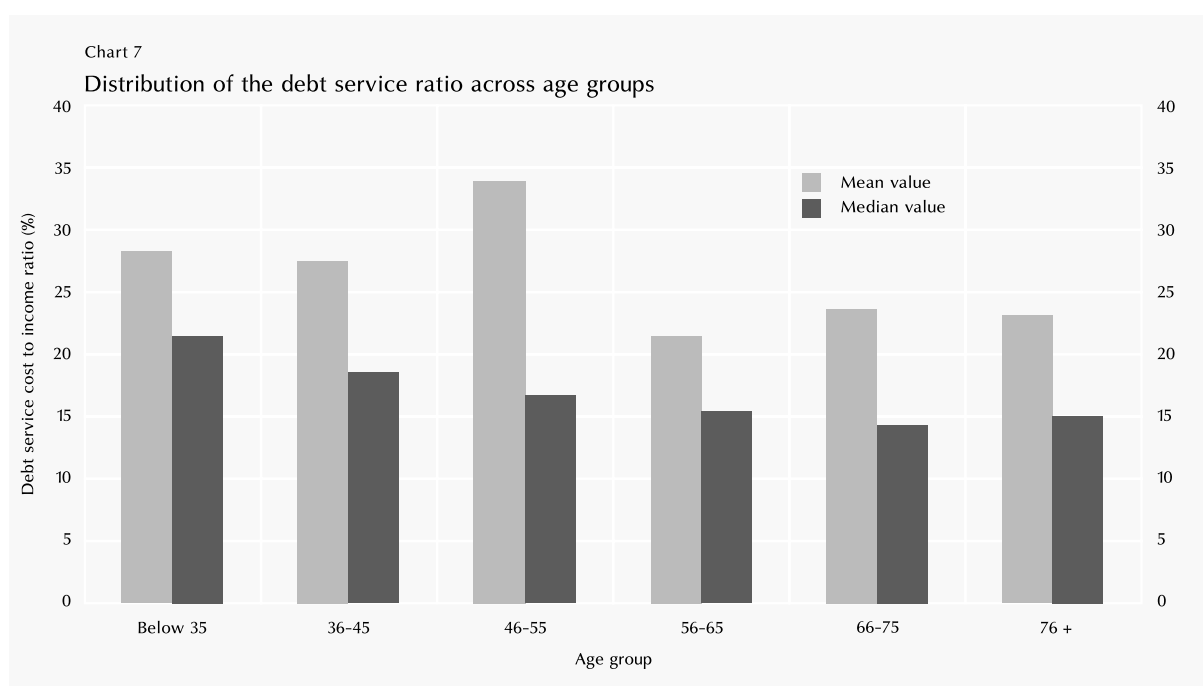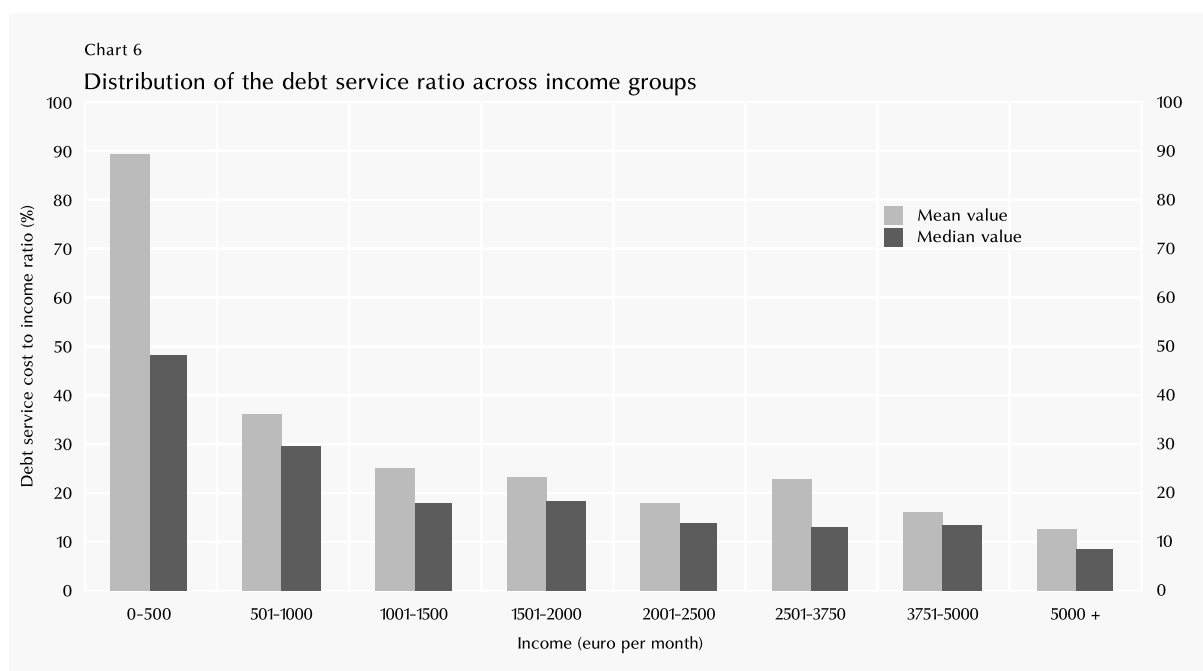
top end of the loan distribution, which are the ones most at risk of not being able to service their loans. For the next income group, i.e. "500-1,000" euro per month, the instalment for the median household falls to just below the 33% threshold, so it can be considered comfortable. For households with higher income, the monthly instalment as a percentage of income is well below the

threshold and falls as household income rises further. Thus, it seems that the vast majority of households are unlikely to face debt servicing difficulties. Only for the lowest income groups may the debt impose a heavy burden as, since their disposable income is low, they could easily skip a payment because of the need to cover other immediate expenses.

The distribution of the debt service ratio across age groups does not suggest that any age group is particularly vulnerable to being unable to service their debts, since for all age groups the mean and —even more so— the median are below one third, though these statistics for lower age groups are somewhat higher than for the older age groups (see Chart 7).

5. Household indebtedness and demographic characteristics

The descriptive analysis in the previous sections indicates that both geography and economic characteristics seem to play a role in a household's decision to take out a loan or in banks' decisions to grant loans. To investigate the extent to which these and other demographic and economic variables affect the probability that a household carries financial debt —or a particular type of loan— logistic regression analysis is used. The demographic characteristics considered are the degree of urbanisation of the area of residence, the composition of the household and the presence of children, as well as the age of the household head. Socio-economic and financial characteristics potentially affecting the household's decision include education, the employment status (employed/unemployed, employee/self-employed, etc.) of the household head, whether he/she is

working in the public sector or not, the number of household members employed, the household's income and its net wealth (total wealth less the balance of housing loans).

Logistic regression (logit) models are fitted for three dependent binary variables, each one indicating whether the household had: (a) any type of loan, (b) housing loans, and (c) other, non-housing loans. A logistic regression model predicts the log of the odds ratio of the dependent variable, i.e. the log of the ratio of the probability of the dependent variable taking the value of 1 to the probability of the dependent variable taking the value of 0.

Combinations of the above independent variables are considered and the two "best" fitting models, for each dependent variable, are presented in the Appendix. More specifically, two alternative models are chosen so that the effects of income and net property —two highly correlated variables— can be presented. The models are selected on the basis of the classification ratio (i.e. the percentage of cases assigned correctly by the model as having a loan or not) and using the criterion that all independent variables in the model were statistically significant, at least at the 10% level. The exponentiated coefficients of the independent variables are given in the Appendix table, while the results of these regressions are summarised in Table 8. In the case of an independent categorical variable, for each category of loan, the coefficient is the ratio of the odds of having a loan of that category to the odds of having a loan of the reference category, controlling for the other variables in the model. Thus, the coefficient on location "semi-urban" indicates the ratio of the odds of having a loan if located in a semi-urban area to the odds of

Table 8
Summary of logistic regression results

Explanatory variables	Reference group	The ratio of the odds of having a specific type of loan for a population group with respect to the reference group		
		Any type of loans	Housing loans	Non-housing loans
Area of residence	*Other urban areas*	– Higher than reference group for Athens and Thessaloniki – Less that reference group for semi-urban areas		
Household composition	*Couple with two or more children*	Smaller than the reference group for all households types		
		The presence of children increases the odds ratio		
Age group	*36-45*	Highest for reference group	Highest for 56-65	Highest for reference group
		Inverse U pattern		
Education	*3 years high school*	Higher for 6 years high school		Higher for 6 years high school
Income	*8,001-13,000*	Increasing with income level		
Net property	*1-10,000*	– Less than reference group for households without any property – Increasing with property level		
Number of household members in employment	*None*	– Increasing with increasing number of members in employment		
Working in the public sector	*No*		Higher if working in the public sector	

having a loan if the household is located in the reference location (other urban areas).

The results indicate that the degree of urbanisation of the area of residence affects the probability of borrowing in a statistically significant way. In particular, for households in the two largest cities of Greece (Athens and Thessaloniki) the odds of having any kind of loan are about 1.3 times greater than the odds for households in other urban areas, and almost twice (1.8 times) the odds of households in semi-urban areas. The same effects are observed for non-housing loans, while the level of urbanisation does not have a statistically significant effect in determining the likelihood of having a housing loan. It seems,

therefore, that non-housing loans are more widespread in the largest urbanised areas. This is not a surprising result given that bank penetration is certainly higher and household access to these categories of bank credit is a lot easier in the large cities than in less urbanised areas.

Household composition is also expected to affect the decision to take out a loan, as it definitely determines the household's financial needs. Indeed, household composition is statistically significant in all regression models, but the individual effects differ according to the type of loan. When all types of loans are put together, a couple with two or more children (reference category) is the most likely to obtain a loan, while a

single-member household, a couple without children, or "other"[19] households are less likely to borrow. Considering housing loans, all types of households are less likely to borrow than a household with a couple and two or more children. It seems, therefore, that owning a house becomes more important when two or more children are present. On the other hand, only single-member households are less likely to take out a non-housing loan than the reference category. Moreover, households consisting of a couple and "other" (than children) members, or other types of households, are more likely to take out a non-housing loan than the reference category, though these effects are significant (at the 10% level) only when income is controlled for in the regression analysis.

The age of the household head also affects the probability of a household having a loan. The two groups at the top and bottom of the age distribution (the below 35 or above 75) are generally less likely to borrow. The younger group may have less potential to be granted a loan due to financial limitations, while the older group is often more conservative or cautious towards borrowing. Regarding non-housing loans, smaller probabilities —diminishing with increasing age category— are observed for those over 45. As regards housing loans, the age groups between 46 and 75 years old are more likely to have such a loan compared with the reference group.

Education has a statistically significant effect in the models for any type of loan and non-housing loans which control for property (and not for income, probably because of the high correlation between income and education). *Ceteris paribus*, households where the head has completed six years of

gymnasium/lyceum (approximately equivalent to A-levels), or even higher levels of education, have a higher probability of having a non-housing loan compared to those where the head has completed only a three-year gymnasium. This is in line with the raw percentages that show that the probability of having a loan increases with education level. Higher odds of having a loan for the better educated may suggest that the latter in general have better income prospects than the less educated people and hence can afford to service a larger loan, in line with their higher current income. Furthermore, more educated people may be better informed than less educated people, being better equipped to digest financial information.[20]

---

19 "Other" households: other than the above categories. They may or may not include children.

20 Along similar lines, Del-Rio and Young (2005b) examine survey evidence on the determinants of participation in the unsecured debt market using waves 5 and 10 of the British Household Panel Survey (BHPS) for 1995 and 2000. The estimated probit models show that age, income, positive financial prospects, education, and housing tenure are highly significant determinants of participation and have the expected sign according to the life-cycle models for consumption. In particular, age is the variable that most strongly affects participation as the probability of having unsecured debt decreases with age for all but those aged 16 to 20. This probability increases with income, taking the highest value for individuals between the 70th and 90th percentile and the lowest for those with income below the 30th percentile. Moreover, having higher educational qualifications or positive income expectations is also associated with a higher probability of having unsecured debt. As regards housing tenure, renters or those who have a mortgage tend to have on average around a 15 percentage point higher probability of having unsecured debt than those living in owned houses. Finally, consistent with Banks *et al.* (2002) the authors found that those with no financial wealth are more likely to have unsecured debt than those with the largest financial asset holdings. Controlling for labour status, they conclude that, in addition to the age effect, retired people are less likely to have unsecured debt at every age than those in work, while the same is true for the young unemployed due to greater uncertainty about future income. In a previous article, Del-Rio and Young (2005a), using the same data set and a self-reported indicator of financial distress as the dependent variable in their estimated ordered-logit model, suggest that the main factors causing debt problems for households are the unsecured debt-to-income ratio, the level of mortgage income gearing, the financial wealth of households, and characteristics like their health, ethnicity and marital status.

As expected, income and the overall economic position of the household influence its probability of resorting to borrowing. A household with small income may need to resort to borrowing to cover financial needs, but its decision to do so will depend on its ability to service a loan. Moreover, as stated above, banks also apply certain income and wealth criteria when granting loans. The analysis shows that income is statistically significant in determining the likelihood of having a loan of any type —housing or "other"— and, in particular, as a household's income increases, its probability of borrowing becomes larger too. For all loans, the "below €8,000" group has the same odds of getting a loan as the "€8,001-13,000" group (reference category), whereas having an income of more than €13,000 increases the odds of borrowing, and more so the higher the income group. Almost the same pattern is observed for housing and "other" loans, with the only difference that the lowest income group (below €8,000) is less likely to get a housing loan than the reference category.

Similar conclusions are drawn when considering household wealth. High levels of household wealth are associated with a higher probability of borrowing. All groups with net property above €10,000 have a higher probability of getting a loan than the reference category, which has some property, but it is worth less than €10,000. Households with no property are less likely to get a loan. The effects for these categories with property above €10,000 are more pronounced when considering housing loans only, which is not surprising since a housing loan by definition creates property. Property seems to affect the probability of having a non-housing loan as well, though the effects on the probabilities are not as strong.

The number of members in work is positively associated with the probability of having a loan. The more household members in employment, the more likely the household is to have any type of loan – housing or "other". It seems that, not surprisingly, people in work have easier access to borrowing, as they may be considered by banks more likely to be able to service their loans.[21]

Finally, whether the household head works in the public sector (civil service) also affects the probability of having a housing loan and the probability of having any loan in general (though only when we control for property and not for income). Working in the public sector (civil service) increases the likelihood of having a housing loan, which might be explained by the favourable mortgage schemes granted to civil servants, in particular by certain specialised credit institutions, as well as by the fact that their income is considered by banks to be more secure.

6. Conclusions

Consumer credit and housing loans have been rapidly increasing during the last few years in Greece, raising concerns about the level of household indebtedness and the ability of households to service their debts properly. In the same period, relatively high GDP growth was driven mainly by the significant acceleration in the growth of domestic demand as well as the expansion in con-

---

21 If we include household head employment status instead of the number of people in employment in the model, then the odds of having a loan are higher for those in employment than for the economically inactive. However, the inclusion in the model of those in employment gives a better model (in terms of predictive power) than the one with employment status.

sumer credit. Hence, the issue of households' potential over-indebtedness is important as it may affect not only the soundness of the banking system but also economic stability and growth. In this regard, using the results of a household survey conducted by the Bank of Greece from late 2002 to early 2003, this article assesses the level of household indebtedness, the factors that determine it and the extent of financial pressure on indebted households.

It should be borne in mind that the reliability of the results presented depends heavily on how representative is the survey and how accurately it records household loan, income and property data. Weights were applied to account for non-response, assuming that the non-responding households have a similar borrowing behaviour as the responding households. Although we do not have any information on the behaviour of the non-responding households, the comparison of the survey's results with key macroeconomic credit data suggested that the survey has reported quite reliably the borrowing behaviour of the sampled population.

Regarding the overall level of indebtedness of Greek households, the survey results suggest that borrowing is concentrated among households with the highest levels of income and wealth. For the average household, its outstanding debt does not exceed its annual income, even for households at the lowest income levels. For the vast majority of households, debt servicing obligations are also well within their income capacity. However, for about 22.6% and 10.0% of the households that have some kind of loan, the monthly instalment for servicing their loan exceeds one third or half, respectively, of their

monthly income. Be that as it may, at the end of 2002 households' debt in Greece was limited in relation to their annual income and wealth. This is also in line with the fact that the total Greek household bank borrowing to GDP ratio, as calculated on the basis of data submitted by banks to the Bank of Greece, was —and continues to be— substantially lower than the corresponding ratio for the euro area.

Finally, the article examined how households' demographic and economic characteristics affect the households' likelihood of having a loan. For this purpose, logistic regression models were estimated for different types of loans. These results showed that the degree of urbanisation, household composition, the household head's educational level and age group, the number of household members in employment, household income and wealth are all significant in determining the probability of a household resorting to borrowing. In particular, the probability of having a loan is higher for households living in the two largest cities of Greece, for couples with two or more children, and for those whose head is in the "36-45" age group, well educated and working in the public sector. It also increases with household income, property and the number of working members.

Bank credit to households has risen significantly since the time when the survey was conducted. We believe, however, that the general conclusions regarding the borrowing behaviour of households still hold. Financial pressure may have changed, but not necessarily in line with the increase in aggregate credit, since the growth of overall household credit may be partly due to the fact that additional households have a loan and does not necessarily mean that only existing

indebted households have increased their outstanding debt. It is noted in this respect that the ratios of non-performing consumer and housing loans (i.e. loans overdue for more than three months) to total consumer and housing loans to households decreased significantly in the 2002-2004 period.[22] However, strong credit expansion to households may lead to increased financial pressure in the future, particularly if there is a slowdown in economic activity, affecting households' disposable income, or a rise in interest rates, which have reached historical lows.

22 See Bank of Greece, *Annual Report 2004*, Athens 2005, Chart X.2, p. 276.

Appendix

Logistic regression results

	All loans				Housing loans				Non-housing loans			
	model 1		model 2		model 1		model 2		model 1		model 2	
	exp(b)	p-value	exp(b)	p-value	exp(b)	p-value	exp(b)	p-value	exp(b)	p-value	exp(b)	p-value
Athens – Thessaloniki	1.27	0.03	1.32	0.01					1.34	0.01	1.36	0.01
Semi-urban areas	0.70	0.02	0.69	0.01					0.78	0.10	0.74	0.05
Single	0.47	0.00	0.52	0.00	0.44	0.00	0.48	0.00	0.69	0.03	0.74	0.08
Couple	0.70	0.04	0.70	0.04	0.37	0.00	0.39	0.00	1.08	0.66	1.01	0.95
Couple with one child	0.86	0.41	0.80	0.22	0.54	0.00	0.49	0.00	1.26	0.18	1.18	0.34
Couple and other adults (except children)	0.90	0.58	0.81	0.29	0.48	0.00	0.43	0.00	1.44	0.06	1.28	0.21
Other households	0.83	0.28	0.80	0.18	0.48	0.00	0.44	0.00	1.32	0.10	1.20	0.27
Below 35 years old	0.75	0.06	0.79	0.14	0.75	0.17	0.83	0.37	0.76	0.08	0.78	0.11
46-55 years old	1.03	0.86	1.04	0.80	1.36	0.08	1.30	0.13	0.78	0.09	0.82	0.18
56-65 years old	0.98	0.89	0.94	0.73	1.86	0.00	1.61	0.02	0.66	0.02	0.62	0.01
66-75 years old	0.76	0.16	0.72	0.11	1.56	0.08	1.23	0.42	0.65	0.03	0.58	0.01
76 years old and over	0.54	0.00	0.57	0.01	1.41	0.23	1.02	0.93	0.43	0.00	0.42	0.00
Education: below primary			0.70	0.12					0.79	0.32	0.72	0.16
Primary education completed			1.06	0.75					1.12	0.53	1.03	0.87
Graduated: 6-year high school			1.42	0.04					1.52	0.01	1.47	0.02
Graduated college or university			1.25	0.20					1.06	0.76	1.22	0.25
With income below 8,000 euro	0.95	0.69			0.65	0.01			1.09	0.50		
with income 13,001 - 20,000 euro	1.73	0.00			1.56	0.00			1.57	0.00		
with income 20,001-30,000 euro	2.21	0.00			1.53	0.03			2.43	0.00		
with income 30,001 or above	3.27	0.00			2.68	0.00			3.41	0.00		
Without any property			0.68	0.04			1.68	0.14			0.64	0.02
Net property 10,001 - 50,000 euro			1.62	0.02			3.91	0.00			1.38	0.11
Net property 50,001-100,000 euro			1.49	0.03			4.43	0.00			1.13	0.50
Net property 100,001-300,000 euro			1.63	0.01			4.25	0.00			1.35	0.11
Net property 300,001 or above			2.24	0.00			4.76	0.00			1.52	0.07
One household member in employment	2.85	0.00	3.01	0.00	1.74	0.01	1.77	0.01	3.26	0.00	3.27	0.00
2+ household members in employment	3.94	0.00	3.95	0.00	3.08	0.00	2.94	0.00	3.77	0.00	3.71	0.00
Working in the public sector	1.15	0.34	1.29	0.08	1.47	0.01	1.85	0.00				
Constant	1.08	0.42	0.76	0.00	0.26	0.00	0.19	0.00	0.67	0.00	0.49	0.00
Classification ratio	68.6		68.7		82.0		81.8		66.3		66.6	

Reference categories: Area of residence: other (than Athens and Thessaloniki) urban areas; household composition: couple plus two children; age group: 36-45; education: 3-year high school; income: €8,000-€13,000. Net property: €0-€10,000; No. of household members in employment: 0; household head employed in the public sector: no.

References

Banks J., Z. Smith and M. Wakefield (2002), "The distribution of financial wealth in the UK: Evidence from 2000 British Household Panel Survey", The Institute for Fiscal Studies, Working Paper 01/21.

Cox P., J. Whitley and P. Brierley (2002), "Financial pressures in the UK household sector: evidence from the British Household Panel Survey", Bank of England *Quarterly Bulletin,* Winter, 410-19.

Del-Rio, A. and G. Young (2005a), "The impact of unsecured debt on financial distress among British households", Bank of England, Working Paper No. 262, London.

Del-Rio, A. and G. Young (2005b), "The determinants of unsecured borrowing: Evidence from the British Household Panel Survey", Bank of England, Working Paper No. 263, London.

DeVaney, S.A. (1994), "The usefulness of financial ratios as predictors of household insolvency: Two perspectives", *Financial Counseling and Planning,* vol. 5, 5-24.

Garman, E.T. and R.E. Forgue (1991), Personal finance, 3rd edition. Boston: Houghton Mifflin Company.

Griffith, R. (1985), "Personal financial statement analysis: A modest beginning", in G. Langrehr (ed.), Proceedings of the Third Annual Conference of the Association for Financial Counseling and Planning Education, 123-31.

Kohler, M., E. Connolly and K. Smith (2004), "The Composition and Distribution of Household Assets and Liabilities: Evidence from the 2002 HILDA Survey", *Reserve Bank of Australia Bulletin.*

Lytton, R.H., E.T. Garman and N.M. Porter (1991), "How to use financial ratios when advising clients", *Financial Counseling and Planning,* 2, 3-23.

Prather, C.G. and S. Hanna (1987), "Ratio analysis of personal financial statements: Household norms", in M.E. Edmondson and K.L. Perch (eds.) Proceedings of the Association for Financial Counseling and Planning Education: 5, 80-88.

Per capita income, productivity and labour market participation: recent developments in Greece*

Daphne Nicolitsas
Economic Research Department

1. Introduction

The convergence of Greece's living standards to those of the European Union of the 15 Member States (EU-15) constitutes a prime policy objective. The aim is for Greece's per capita income to reach the average of the EU-15,[1] despite the reservations frequently expressed in the literature regarding the relevance of this measure as an indicator of living standards.[2] According to the latest available data for 2004, per capita income in Greece, in purchasing power parities, amounted to 75% of the EU-15 average. The exact size of the gap has been a matter of considerable controversy among the social partners despite the fact that this debate is not particularly meaningful since, as both the Organisation for Economic Cooperation and Development (OECD) and Eurostat stress, small differences in per capita income (expressed in purchasing power parities) are neither statistically nor economically

1 The average EU-15 per capita income conceals significant disparities between Member States. For instance, Ireland's per capita income is 27% higher than the EU-15 average, whereas Portugal's is 34% lower. See Eurostat (2005).

2 These reservations concern, *inter alia,* the limited scope of the index, which does not take into account the magnitude of the shadow economy, the side-effects of certain economic activities (e.g. air pollution) or the deterioration in wellbeing caused by other developments (e.g. an increase in the crime rate). See, *inter alia*, Zolotas (1982), the relatively recent literature on the "Economics of Happiness" (Layard, 2005), as well as estimates of productivity change which take into account the adverse environmental effects of growth (Yörük and Zaim, 2005).

significant (Eurostat, 2004).[3] In the absence of suitable data, the discussion on the reasons for this divergence has been limited. Notwithstanding data shortcomings, however, the explanations for the divergence must be investigated to help expedite the convergence process.

What follows is an attempt in this direction. Using a growth accounting framework, the gap in per capita income is decomposed into its main sources. The analysis shows that labour productivity in Greece, despite showing high rates of growth over the last few years, still lags behind the EU-15 average and that this is the main reason for the difference in per capita income. Possible explanations for this gap should be sought in the quality of the business environment, lack of competition, the small size of Greek firms, the delay in adopting new technologies and the shortcomings of the educational system. Another factor that contributes, though to a lesser extent, to Greece's lower living standards is the lower labour force participation rate, which mainly reflects the fact that young people enter the labour market at a later age than in the rest of Europe and the moderate labour force participation rate of women. The employment rate discrepancy arises, *inter alia*, from "cultural" factors, Greece's higher unemployment rate and the more extensive participation of young people in educational activities.

The high rate of productivity growth in recent years −more evident in certain sectors of economic activity− can in part be attributed to the increase in capital per employee, but is mainly due to technological progress. The continuation of the high rates of productivity growth, necessary to achieve convergence, will depend on the increase in the economy's potential output. In view of the anticipated demographic developments, however, both productivity and the employment rate will have to increase if Greece's per capita income is to converge towards the EU-15 average.

The rest of the paper is organised as follows: Section 2 contains a brief outline of the methodology followed; Section 3 provides a summary of per capita income changes in Greece and the EU-15; Section 4 focuses on labour productivity developments and discusses certain hypotheses regarding the possible explanations of the labour productivity gap between Greece and the EU-15 average. Section 5 compares employment rates between Greece and the EU-15 and, finally, Section 6 summarises the findings.

2. Methodology

The methodology followed herein is used extensively in the economic growth literature. The growth rate of per capita income is decomposed into the growth rate of labour productivity and the growth rate of labour force participation.[4] The contribution to productivity change of each factor of production and of technologi-

---

3 The discrepancy in gap size estimates is for the most part attributed to methodological differences in measuring income in purchasing power parities. The frequent revisions of output, employment and purchasing power parities data have also led to a plethora of estimates.

4 $\frac{Y}{H} = \frac{Y}{N} \times \frac{N}{H}$ where Y is the real gross domestic product, H is the population, and N is employment. The percentage change in real per capita income, $\Delta\ln\left(\frac{Y}{H}\right)$, is therefore equal to the sum of the percentage change in labour productivity, $\Delta\ln\left(\frac{Y}{N}\right)$, and the percentage change in the employment-to-population ratio, $\Delta\ln\left(\frac{N}{H}\right)$. It should be noted that, although output per hour worked is a more accurate measure of labour productivity than the product per worker, the latter was used in this paper due to the lack of consistent data on hours worked.

Chart 1

Real per capita income in Greece (in euro and in 1995 prices) and its annual percentage changes

Per capita income (left-hand scale)
Annual percentage change (right-hand scale)

Sources: NSSG and Eurostat (New Cronos Database).
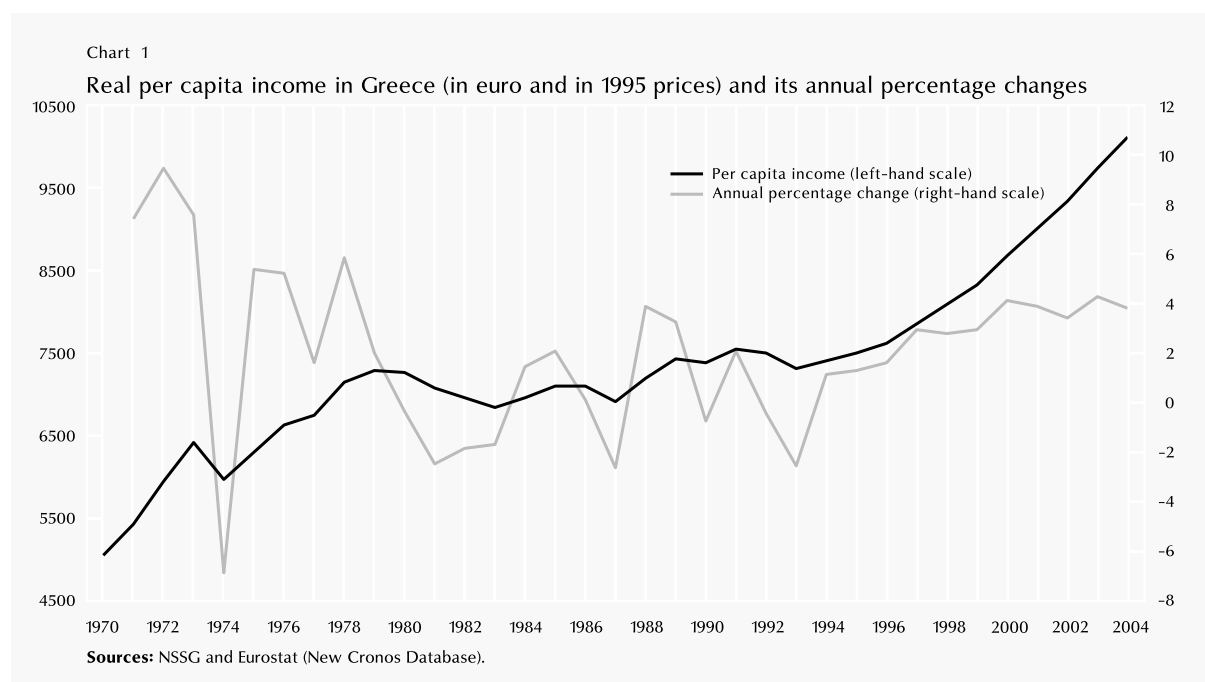
cal progress is then estimated.[5] Proceeding in this way obviously has certain drawbacks since determinants of changes in the quality and quantity of the factors of production (for instance, the availability of natural resources, economic policies, regulatory environment, research and development expenditure, etc.) and technological progress cannot be separately identified. Furthermore, contrary to the new, endogenous growth theory, this methodology assumes that technological progress is exogenous and thus ignores any interaction between the latter and the quality and quantity of the factors of production.[6] In spite of these shortcomings, however, this methodology is used extensively to determine *inter alia* the contribution of Information and Communication Technology (ICT) to economic growth in the United States and the European Union (EU) (see, for example, Jorgenson and Stiroh, 2000, and van Reenen, 2001).[7]

3. Developments in per capita income in Greece and the EU-15

During the period 1971-2004, real per capita income in Greece grew at an average annual rate of 1.9% and thus nearly doubled (Chart 1).[8] More

5 We assumed a standard Cobb-Douglas production function with constant returns to scale $Y = A K^{\alpha} N^{1-\alpha}$, where A reflects technological progress (known as "total factor productivity" or the "Solow residual"), and α and $1-\alpha$ measure the output elasticity of capital and labour, respectively. Assuming perfect competition, these elasticities are equal to the respective shares of capital and labour in total income. By rewriting the production function in intensive form and taking first differences of the logs, the percentage change of labour productivity can be expressed as the sum of technological progress and the weighted percentage change of capital per worker:

$$\Delta \ln \left(\frac{Y}{N} \right) = \Delta \ln A + \alpha \Delta \ln \left(\frac{K}{N} \right)$$

In this paper, α was assumed to be constant and equal to 0.3.
6 See, *inter alia*, Barro (1998) and Crafts and O' Mahony (2001).
7 This approach determines the productivity contribution of ICT, but does not explain why ICT penetration differs across countries.
8 The definitions and sources of variables used are presented in the Appendix. Unless otherwise stated, all average rates presented are geometric means.

Table 1

Per capita income, labour productivity and employment rates in Greece, 1971-2004

	Per capita income (in 1995 prices, EUR thousands)	Labour productivity (in 1995 prices, EUR thousands)	Ratio of total employment to total population (%)	Ratio of total employment to total population aged 15-64 years (%)	Ratio of the population aged 15-64 years to total population (%)
Absolute figures					
1971-1981	6.3	17.7	35.5	55.4	64.2
1982-1985	7.0	19.8	35.2	54.0	65.2
1986-1989	7.2	20.2	35.5	53.7	66.1
1990-1995	7.5	20.9	35.6	53.0	67.2
1996-1999	8.0	21.8	36.6	53.9	67.8
2000-2004	9.4	24.6	38.1	56.2	67.8
1971-2004	7.7	21.3	36.2	54.3	66.7
Average annual percentage changes (%)					
1971-1981	2.7	2.7	0.0	–0.1	0.1
1982-1985	0.0	0.1	-0.1	–0.5	0.4
1986-1989	1.2	1.0	0.2	–0.2	0.4
1990-1995	0.2	0.0	0.2	0.0	0.2
1996-1999	2.6	2.0	0.6	0.5	0.1
2000-2004	4.0	2.8	1.2	1.3	–0.1
1971-2004	1.9	1.6	0.3	0.1	0.2

Notes: Employment data for 1971 are from the population census of that year; data for the period 1981-2004 are based on the Labour Force Surveys, after adjusting the series to ensure consistency with population censuses and to correct for the breaks in the Labour Force Surveys in 1998 and 2004. Population data refer to mid-year estimates. Due to the lack of employment data for the period 1971-81, averages are estimated using the values for 1971 and 1981. For those two years, employment data are from the population censuses.
Sources: National Accounts, Population Censuses 1971-2001, Labour Force Surveys and Eurostat (New Cronos Database).

specifically, per capita income in 1995 prices rose from €5,500 in 1971 to €10,100 in 2004. Obviously, this average rate of change masks significant year-on-year fluctuations in the rate of per capita income growth (see Chart 1 and Table 1). The growth rate was generally positive in the 1970s, with the exception of 1974, but then slowed considerably up to the mid-1990s, and was in fact negative in the early 1980s and early 1990s. Since the mid-1990s, growth has recovered, with the average annual rate of expansion over the period 1996-2004 standing at 3.4%.

The change in per capita income during the period 1971-2004 was a result of changes in labour pro-ductivity, which increased at an annual average rate of 1.6%, and of a slight increase, of the order of 0.3%, in the employment rate. Until 1995, however, given that the employment rate remained steady and the unemployment rate rose, the rise in per capita income was mainly driven by the change in productivity. It is only after 1996 that the employment rate began to rise, while the unemployment rate decreased after 1999.

The average annual growth rate of per capita income in the EU-15 followed a similar course during the 1971-2004 period, although fluctuations in most Member States were much milder than in Greece (see Table A1 in the Appendix). Another

Chart 2

Sources of per capita income differences with the EU-15 (EU-15=100), 2004

	Difference in per capita GDP with the EU-15 (in percentage points)	Difference in employment-to-population ratio (in percentage points)	Difference in productivity per worker (in percentage points)
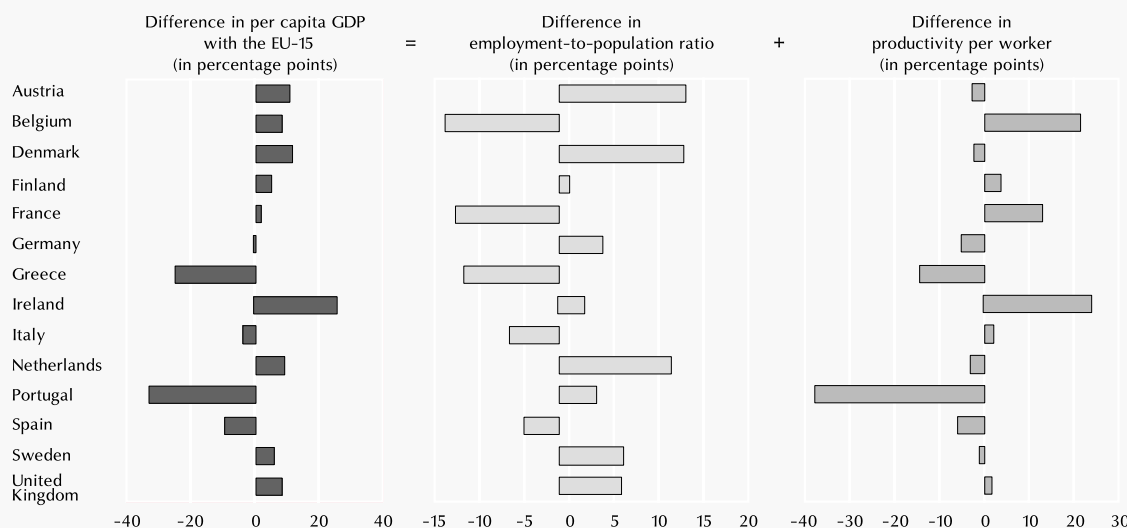
Sources: NSSG and Eurostat.

appreciable difference is that the slowdown of economic growth in the EU-15 after the 1970s was not as pronounced as in Greece. The growth rate of per capita income of the EU-15 declined gradually but steadily, without, however, registering a recovery similar to the one observed recently in Greece.

In purchasing power parity terms, Greece's per capita income in 2004 amounted, as mentioned in the introduction, to 75% of the EU-15 average. Of this 25 percentage point gap, some 14 percentage points are attributed to Greece's lower productivity per worker, with lower labour market participation, relative to that of the EU-15, accounting for the rest (see Chart 2). Greece's labour productivity performance is even poorer when calculated on a per hour worked basis rather than per person.[9] This is due to the fact that the average actual annual hours (i.e. after taking vacation days and absences from work into account) worked per

person in employment are much higher in Greece than in the EU-15. This difference in *annual* working hours is due to the greater number of both weekly working hours and annual working days in Greece (OECD, 2004a). *Weekly* working hours per person are longer in Greece due to the lower rate of part-time employment, to more overtime, and to the higher incidence of moonlighting, even though contractual working hours do not differ significantly. Greece's larger number of annual working days is due to the fact that there are fewer holidays, vacation days and absences (illness, etc.) in Greece than on average in the EU-15 (possibly because Greece has a significantly higher percentage of self-employed).

---

9 More specifically, it is estimated that productivity per hour worked in Greece amounted to roughly 65% of the EU-15 average in 2003, the last year for which National Accounts data (adjusted on the basis of Labour Force Survey revisions) on hours worked are available.

T a b l e 2

Educational attainment of workers

(Percentages)

	University	Upper secondary education	Basic education	Lower educational level	Total
1971	4.9	17.8	46.9	30.4	100.0
1981	7.4	20.5	55.3	16.8	100.0
1991	12.7	41.2	43.4	2.7	100.0
2001	16.8	55.2	27.0	1.0	100.0

Notes: Workers classified as having achieved upper secondary education include graduates from non-university tertiary education institutions, students currently enrolled in university or non-university tertiary institutions, upper secondary school graduates, technical-vocational school graduates and lower secondary school graduates. Workers classified as having achieved basic education include those who did not complete their lower secondary schooling, those who completed their primary schooling, as well as those who failed to complete primary school but nonetheless know how to read and write.
Sources: Population censuses 1971-2001.

4. Labour productivity: developments and possible explanations of the gap with the EU-15 average

4.1. Time variations

Labour productivity in Greece increased at an average annual rate of 2.7% between 1971 and 1981. This growth, the result of a successful performance in most significant sectors of the economy[10] during the first half of the decade,[11] is probably due to the low initial level of productivity[12] and reflects, *inter alia,* both an increase (by 59%) in capital deepening[13] and an improvement in workers' skills (see Table 2). As an indication, note that the percentage of workers who had not completed compulsory education in 1981 was half the respective percentage of 1971.

The greatest contributor to productivity growth during this period was the manufacturing sector,[14] with an average annual 3% rise in productivity. It is worth noting that this performance took place despite the concurrent increase in employment in the sector, which resulted in a 2 percentage point rise in the sector's participation in total employment (from 17.2% in 1971 to 19.2% in 1981). This development was, however, to be expected given the initially low level of capital stock[15] and the subsequent significant (66%) increase in capital per worker.

[10] The analysis focuses on the following sectors: primary sector, manufacturing, construction, trade and hotels-restaurants, transport and communications, financial sector and real estate management, "non-market" services (education, health, public administration, other social services). Only in construction was the level of productivity significantly lower in 1981 than in 1971, as the rapid increase in the sector's output in the early 1970s proved to be shortlived.

[11] See, *inter alia,* Alogoskoufis (1995) and Mihail (1995) for an analysis of economic developments during this period.

[12] The level of labour productivity during 1960-69 was about half the corresponding average for 1970-79.

[13] The rate of change refers to the net capital stock and includes dwellings. Excluding dwellings, the rate of increase in the capital stock per worker amounts to 65%.

[14] However, the highest *percentage* increase in productivity between 1971 and 1981 was recorded in the electricity, natural gas and water distribution sector. This is due to the sharp increase in output, owing to the integration into the grid of new —mainly hydro-electric— power generation units (see, for instance, the Annual Reports of the Governor of the Bank of Greece during that decade).

[15] According to the European Commission AMECO database, it is estimated that during the 1960s the net capital stock per worker in Greece was about 44% the corresponding average for the EU-15.

During the period 1982-95, productivity growth fell considerably below 1%. This slowdown is attributed (see Alogoskoufis, 1995; Mihail, 1995) to institutional factors and uncoordinated economic policies (e.g. expanding role of the State, distortionary taxation, etc.), as well as to the ensuing restrictions on investment expenditure and the global economic developments at the time. This period was marked by a substantial difference in productivity developments across sectors. Thus, while productivity in transport and communications and construction improved significantly, no upward *trend* was recorded in the primary and manufacturing sectors. In fact, the primary and manufacturing sectors' *contribution* to the average annual change in the Greek economy's overall productivity[16] was on average *negative* during this period. Even though the average growth rate of investment expenditure from 1982 to 1989 was lower than in the 1970s, capital per worker continued to contribute positively to the change in labour productivity in manufacturing.[17] In fact, it was low "technological progress" that was responsible for the slowdown in the rate of labour productivity change in manufacturing.[18]

From the mid-1990s onwards, the productivity growth rate made an impressive comeback. More specifically, from 1996 to 2004 labour productivity increased at an average annual rate of 2.4%, and moreover picked up from 2.0% in 1996-99 to 2.8% in 2000-04. This improved performance, though to some extent due to capital deepening, is for the most part attributed to the increase in "total factor productivity" or "technological progress". More specifically, it has been estimated that capital deepening accounted for one quarter of the productivity increase, while the remaining three quarters are attributed to "tech-

nological progress". "Technological progress" — also known as the "Solow residual" or "total factor productivity"— reflects a number of factors, such as the improvement in workers' skills, better organisation, administration efficiency, etc. Indeed, if services of "skilled" workers are clearly distinguished within the production function, a significant part of technological progress can be attributed to an improvement in the quality of the labour input.[19]

The limited contribution of capital to the improvement in labour productivity comes somewhat as a surprise, considering the sizeable increase in investment expenditure in recent years.[20] One possible explanation for this finding is that the difficulties in measuring capital may have led to an underestimation of its contribution. A second

---

16 For more detailed data on this period, see Ministry of National Economy (1999).

17 Since 1989, capital stock data in manufacturing are no longer available from the OECD.

18 Bosworth and Kollintzas (2002) and Savva-Balfoussias (2004) also reach similar conclusions on the economy's overall performance.

19 Total employment *(N)*, in the Cobb-Douglas production function, is replaced by N^*, which measures effective (real) employment and is defined as: $N^* = N_s^\theta N_u^{1-\theta}$, where N_s and N_u are skilled and unskilled workers, respectively, and θ represents the elasticity of real employment with regard to skilled employment. Assuming perfect competition, θ is equal to the ratio of skilled workers' earnings to total earnings in the economy. Accordingly, the rate of change of technological progress $\Delta \ln A$ is expressed as:

$$\Delta \ln Y - a \Delta \ln K - (1-\alpha)\theta \Delta \ln N_s - (1-\alpha)(1-\theta)\Delta \ln N_u$$

The terms $(1-\alpha)\theta$ and $(1-\alpha)(1-\theta)$ are estimated as the share, in total output, of skilled and unskilled labour earnings, respectively. The distinction between skilled and unskilled workers was based on information regarding their educational attainments. Thus, skilled workers were defined as those who had completed tertiary education or at least one year in an institution of higher education. The share of skilled workers' earnings was calculated, using data from the 2001 Annual Industrial Survey, based on the assumption that the daily average earnings of an unskilled worker amount to roughly 55% of the earnings of a skilled one.

20 The average annual growth of real gross fixed capital formation in Greece reached 8.4% during the period 1996-2004, against a mere 2.6% in the EU-15.

explanation could be that the positive impact of infrastructure investment −which accounts for some 19% of total investment[21]− is probably reflected more in total factor productivity than in capital productivity (see, for instance, Yeaple and Golub, 2002). Data per sector or geographic region are, however, probably better suited to test for the existence or otherwise of a correlation between public investment and productivity (see, for instance, Holtz-Eakin, 1994). Finally, this result may be attributable to economies of scale in the production process (Savva-Balfoussias, 2004).

During the period 1996-2004, labour productivity increased in most major sectors of economic activity. The sectors with the highest contributions were transport and communications (0.6 percentage point), wholesale and retail trade (0.4 percentage point) and the construction sector (0.3 percentage point).

Given the disparity in performance across sectors, the contributions of capital and technological progress need to be estimated separately for each sector. Such an analysis requires data on capital broken down by industry. For Greece such data are not available for the period under review. In order to estimate the changes in capital stock, we therefore constructed a series of capital input data for some sectors, based on available sectoral investment and depreciation data.[22] These data indicate that the capital increase per worker contributed to the rise in labour productivity in the manufacturing sector, but also in certain services (e.g. transport and communications, financial sector, hotels and restaurants). In some industries (such as construction, transport and communications) however, the increase in capital,[23] albeit significant, cannot single-handedly explain the

noticeable labour productivity gain. In such instances, "technological progress" appears to have contributed more than capital.

Cyclical fluctuations in the rate of productivity change

A question that arises here is whether the improvement in labour productivity is sustainable or whether it is merely attributable to the favourable economic conjuncture of the past few years, as a result of the inflow of European funds under the 2nd and 3rd Community Support Frameworks, pressure to complete significant infrastructure projects needed for the hosting of the 2004 Athens Olympic Games, and particularly favourable conditions in the merchant shipping industry.[24] The positive correlation between measured productivity and economic cycle fluctuations is substantiated by economic theory and corroborated by econometric studies (see Hall, 1988, and Gordon, 2004). The simplest explanation for this correlation is that inputs into the production process are not correctly estimated (for instance, even data on hours worked do not reflect the actual effort put in by workers). As a result, measured productivity (but not real pro-

---

21 This calculation was based on the construction expenditure of the public sector (general government and public enterprises) from the provisional 2003 National Accounts.

22 These estimates are based on the equation $K_t = (1-\delta)K_{t-1} + I_t$ where K, I, δ denote capital, investment and the depreciation rate, respectively. The rates of depreciation per sector and capital type (equipment, buildings) were taken from O' Mahony and Timmer (2002). In order to calculate weighted depreciation rates for each sector, certain assumptions were made about the capital composition in each sector.

23 It should be noted that real investment in the transport and communications sector quadrupled over the period 1995-2003 and, more importantly, increased from about 1/4 of the sector's gross value added at the beginning of this period to more than 1/2 in 2003.

24 See Bank of Greece, *Annual Report 2004*, pp. 246-50.

ductivity) appears to be cyclical. Other explanations for this positive relationship include a potential correlation between exogenous changes in the technology of production and the existence of increasing returns to scale in the production process (see Basu, 1996).

Three different approaches were used to investigate this question:

1. The first, a purely statistical approach, consists of computing the long-term trend using the Hodrick-Prescott filter.[25]

2. The second approach compares the rates of productivity change per worker with the rates of productivity change per hour worked.

3. The third approach, which was only applied to the manufacturing sector, examines the correlation between the rate of productivity change in manufacturing and the capacity utilisation rate.

The Hodrick-Prescott (H-P) method

The H-P method was applied to the annual rate of productivity change. The results obtained (see Table A2 in the Appendix) suggest that the recent increase in Greece's labour productivity reflects an improvement in the long-term trend and not a short-term cyclical phenomenon. In fact, this conclusion is robust to changes in the "smoothness" parameter and in the frequency of observations.[26]

Variations in productivity per hour worked

Had the recent increase in productivity not been structural, firms would have considered it

temporary and would therefore increase hours of work, rather than the number of employees. This would result in lower rates of productivity change per hour worked compared to rates of productivity change per worker. The data show that, with the exception of 1999, there is not much of a discrepancy between the rates of change of productivity per worker and those of productivity per hour worked. However, the fact that the number of working hours per worker did not decrease after rising significantly in 1999 suggests that labour use has somewhat intensified.

Capacity utilisation

The degree of capacity utilisation provides an alternative way of measuring the intensity of the production process, which mainly captures the utilisation of capital equipment and not of employment (Nickell, 2005).

The Foundation for Economic and Industrial Research (IOBE), in conducting its monthly surveys of economic conjuncture, collects data on capacity utilisation from industrial firms. According to the definition used, firms are deemed to make *full* use of their capacity when production can be increased *only* by upgrading existing equipment. These data help distinguish between real and measured increases in productivity. If the measured increase in productivity is not accompanied by an increase in capacity

---

25 The Hodrick-Prescott method is a univariate statistical technique, which smoothes time series by removing cyclical fluctuations and, as explained in the Appendix, minimises the sum of the squared deviations of the long-term trend from the observed series.

26 Results based on quarterly data should be treated with caution, since these data are available only from 1995 onwards.

utilisation, then there is also a real increase in productivity.[27]

According to available data for the period 1993-2004, the average capacity utilisation rate for the sample of firms surveyed by IOBE was 76%. This rate has of course fluctuated and in recent years (2000-04) exceeded the average by almost 1 percentage point. The correlation between the percentage change in productivity and the deviation of the degree of capacity utilisation from its mean does not, however, allow us to draw definite conclusions; the correlation, though positive, is not statistically significant, due to the insufficient number of observations. Other studies, following a different methodological approach, conclude that there has been a definite increase in equipment utilisation (see Savva-Balfoussias, 2004).

From the above, it appears that the recent improvement in productivity growth denotes a structural change, even if part of this improvement reflects cyclical factors.

4.2. Possible causes of the gap in productivity with the EU-15 average

Despite the significant rates of labour productivity growth in recent years, Greece's productivity is still lower than that of its European partners. Understanding the reasons for this lag in productivity is crucial if Greece is to achieve convergence in this field. Among the factors that might have a negative impact on labour productivity in Greece are the following:

(a) The business environment

The impact of the business environment — bureaucracy, government regulations— on the

productivity of an economy cannot be overstated (see, *inter alia*, Porter, 1990). A low-quality business environment has a negative impact by inducing a reduction in investment expenditure and a loss of potentially productive working hours. Chart 3 below clearly illustrates the negative relationship between the productivity level (productivity per hour worked) and an indicator of administrative regulation in OECD countries.[28]

Attempts have been made to quantify the cost of bureaucracy for the Greek economy. The latest such estimate, published in a pilot survey conducted jointly by the Federation of Greek Industries (SEV) and IOBE in 2005, shows that for small businesses (with 2-50 employees) the cost of bureaucracy (defined as including the cost of compliance with administrative requirements, the cost resulting from the delays in government payments, in carrying out business investments or other actions) amounts, on average, to 7.2% of a firm's value added.

These calculations obviously underestimate the total cost of bureaucracy for the economy, since the loss of revenue from investments that failed to take place as a result of administrative burdens is not taken into account.

(b) Firm size

Firms in Greece are much smaller than in most other EU economies (see Table 3). According to Burtless (2002), the small size of Greek firms is

---

27 This, of course, does not preclude that higher capacity utilisation can be accompanied by improvements in productivity.
28 The administrative regulation indicator, presented by Conway *et al.* (2005), takes values between 0 and 6. The lower the indicator value, the lower the administrative burden.

Chart 3

Productivity per hour worked and administrative regulations in OECD countries, 2003

Labour productivity (US=100)

Administrative regulation indicator

Sources: OECD (2005) and Conway *et al.* (2005).
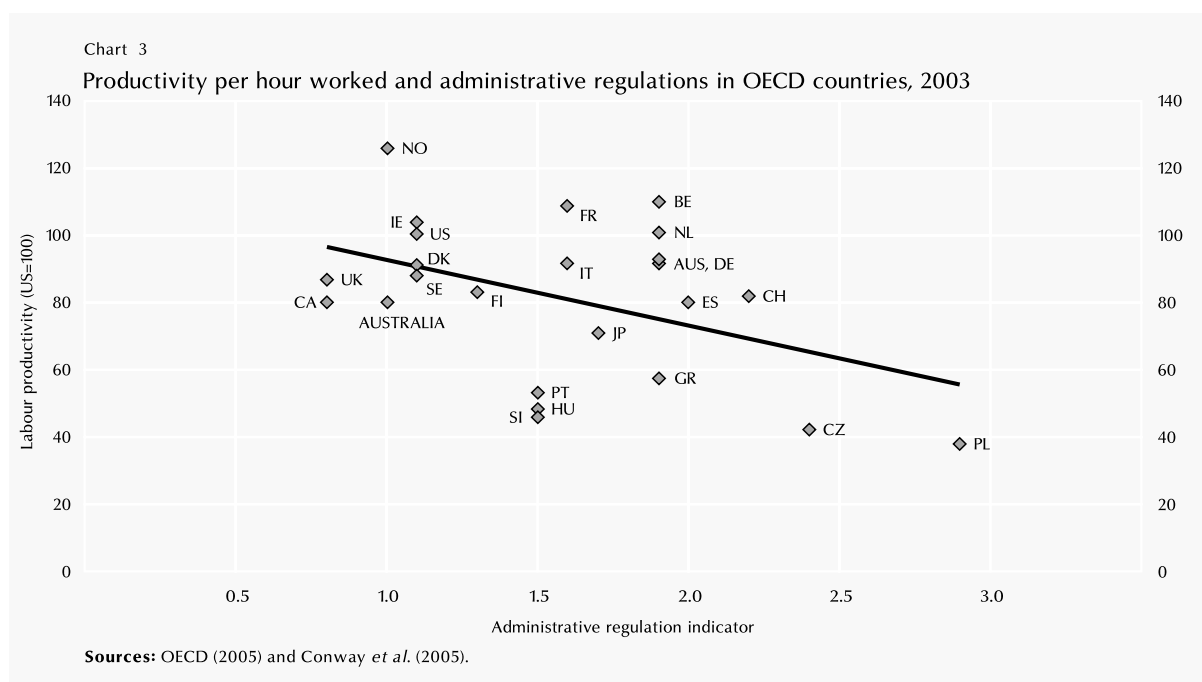
Table 3

Size distribution of firms, 2001-2002

Employment class	Greece[1]	EU-7[2,3]
Private non-primary sector[4]		
0-4	95.9	89.2
5-9	2.1	5.4
10-19	1.0	3.0
20+	1.0	2.4
Industry (Mining, manufacturing, electricity, natural gas, water supply)		
0-4	90.4	74.0
5-9	4.3	10.6
10-19	2.5	7.8
20+	2.8	7.6
Construction		
0-4	97.7	86.6
5-9	1.1	7.1
10-19	0.5	3.8
20+	0.7	2.5
Services		
0-4	96.5	92.3
5-9	1.9	4.3
10-19	0.9	1.9
20+	0.7	1.5

1 Data for Greece refer to 2002.
2 Denmark, Finland, Italy, Luxembourg, the Netherlands, Spain and Sweden.
3 Data for the EU-7 refer to 2001.
4 Defined as the total economy apart from the primary sector and non-market services.
Sources: NSSG (Company register) and Eurostat (NewCronos/theme4/SBS/Bus_Demo).

Table 4
Average hourly expenditure on wages and salaries per worker, 2001[1]
(In euro)

Employment class	Expenditure
10-49	6.4
50-249	7.8
250-499	8.4
500-999	9.9
1,000 or more	12.4

1 Data refer to the private non-agricultural sector (as defined in note 3 of Table 3).
Source: Labour Cost Survey 2000 (Eurostat, New Cronos Database).

one of the main explanations for Greece's lower level of productivity.

The positive relationship between firm size and productivity levels is often attributed to the ability of large firms to exploit economies of scale.

One of the observations cited in support of this positive correlation is that wages appear to be a direct function of firm size (Oi and Idson, 1999). Others, however, interpret the payment of higher wages as simply reflecting the higher educational level of the specific firms' employees. In fact, they claim that conditioning on the productive features of these employees it can be shown that their wages, and therefore their productivity, are not higher because they work in large firms but because their personal qualifications are simply better (see, for instance, Evans and Leighton, 1989).

At first glance, the positive relationship between salaries and firm size also appears to be true in Greece, as shown by the data presented in Table 4.[29] The data suggest that for the economy as a whole the average hourly expenditure on wages and salaries varies positively with firm size. Although the function is not necessarily monotonic this relationship appears to hold in most sectors of economic activity.

Furthermore, a comparison of the productivity levels in manufacturing firms with over 10 employees with that of larger firms with over 20 employees suggests that productivity in the latter sample is higher (4% higher in 1998, see Chart 4).

(c) Delays in the adoption of new technologies

The Greek economy is slower than other economies in adapting to technological change,[30] as shown, for instance, by the relatively limited penetration of new technologies in the production process. The limited penetration of Information and Communication Technology (ICT), which is indeed "new", cannot be held responsible for the decades-long productivity gap between Greece and the EU-15.[31] It is, however, a good indication of the slow pace at which "new technologies" are adopted in general. The positive correlation between new technologies and productivity growth is still widely debated, especially in the United States. The results seem to suggest that the positive corre-

29 In order to verify that the correlation is indeed positive, one has to condition on all other determinants of compensation expenditures (e.g. sector of economic activity, educational attainment, extent of overtime work, etc.).
30 The negative impact on productivity from the delay in adopting new technologies is discussed by, *inter alia*, Mihail (1995).
31 For example, in July 2004 the percentage of the total population with a high-speed broadband connection was 0.2% in Greece, compared to 7.6% in the EU-15; furthermore, in 2004 only 17% of households in Greece had home internet access, compared to 45% in the EU-15.

Chart 4

Index of value added per worker in firms with over 20 employees, compared to that in firms with over 10 employees, 1998

(Firms with over 10 employees=100)

Note: The numbers across the horizontal axis correspond to the double digit codes given to the manufacturing sub-sectors (see NSSG (1994) STAKOD-91 for an explanation of the codes).

Sources: Annual Industrial Survey, 1998.

lation between the adoption of new technologies and productivity growth is not unconditional, nor does it hold for all sectors. However, in the case of Greece, where ICT penetration is very low, the use of new technologies would undoubtebly help improve productivity, especially if these were to be integrated in a coordinated and globalised manner to fully exploit their "network effects".

(d) Limited competition in important sectors of the economy

According to economic theory, lack of competition leads to ineffective resource allocation, a reduction in output and lower company efficiency (see, for example, Browning, 1997, Harberger, 1954, Nalebuff and Stiglitz, 1983). These effects are due to, *inter alia*, rent-seeking behaviour and the lack of effective incentives for rational management in businesses within oli-

gopolistic sectors. Moreover, according to certain theoretical models, the monopolistic structure of a given sector may act as a deterrent to research, development and innovation.

The lack of competition in Greece is evidenced by *inter alia*: (a) the extent of regulations, (b) the limited liberalisaton of utilities, and (c) the extent of agreements and harmonised practices between companies.[32] The lack of competition in the Greek economy does not appear to be caused by legal barriers to market entry. Instead, the constraints on business activity and the lack of competition seem to be caused by administrative barriers to business start-ups and by the complexity of, and the frequent changes in, the regulatory environment, which in turns lead existing businesses to pursue harmonised practices.

---

32 See Bank of Greece, *Monetary Policy 2004-2005*, Appendix to Chapter III, February 2005.

Student performance in the Programme for International Student Assessment "PISA 2003"

	Greece			OECD
	Mean performance[1]	Lowest 10 percentile	Highest 10 percentile	Mean performance in OECD countries
Reading literacy	472	333	599	494
Mathematical literacy	445	324	566	500
Science literacy	481	349	610	500

1 The scores correspond to grades given to tests carried out in all OECD countries. The score range was constructed in such a manner that 500 corresponds to the mean score for mathematical and scientific literacy and 494 to the mean for reading literacy. Details on the interpretation of the discrepancies from mean scores are provided by the OECD (2004b).
Source: OECD (2004b). Learning for tomorrow's world. First results from PISA 2003.

(e) Shortcomings of the educational system

As mentioned above, the improvement in the educational level of workers has contributed to the rise in productivity. In spite of the progress recorded, however, Greece's educational system still fares poorly compared to that of other OECD countries. According to the results of the 2003 Programme for International Student Assessment (PISA) conducted by the OECD, 15-year olds in Greece obtained the worst literacy and numeracy scores in the EU-15 and some of the poorest scores in the whole OECD area (see Table 5).[33]

5. Labour force participation: developments and differences relative to the EU-15

In order to discuss developments in the employment rate, it is useful to express it as a function of the unemployment rate, the labour force participation rate and the age structure of the population. More specifically, the number of workers as a proportion of the population can be decomposed as follows:

$$\frac{N}{H} = \frac{N}{L} \cdot \frac{L}{H_I} \cdot \frac{H_I}{H} = (1-u) \cdot \frac{L}{H_I} \cdot \frac{H_I}{H}$$

where N is the number of workers, H is the population, L is the labour force, H_I is the population aged 15-64 years and u is the unemployment rate. The deviation (over time or between countries) in the employment rate is equal to the sum of the following variables: the difference in the unemployment rate (u), the percentage point change in the labour force participation rate (L/H_I) and the percentage point change in the proportion of the population aged 15-64 years (H_I/H).

Employment rates have always been lower in Greece than in the EU-15 for a number of rea-

---

33 Further details about this assessment exercise were published in the OECD report (2004b), while comments from the Greek Ministry of Education on Greece's scores are available (in Greek) at http://www.ypepth.gr/el_ec_page2079.htm.

sons: "cultural factors" (i.e. the position of women in the organised labour market), the nature and intensity of economic activity, and institutional factors (see for instance OECD, 2005b, Pissarides *et al.*, 2005). More specifically, in 1971 Greece had an employment rate of about 36%, when in the EU-15 it was 40%. By 2001, Greece's employment rate had risen to 37.4%, but the gap with the EU-15 had in fact widened, since the employment rate in the latter was 43.6%.

Table 6 summarises developments with regard to employment and unemployment rates in Greece and the EU-15 over the period 1971-2001 based mainly on census data. In Greece, the employment rate decreased from 1971 to 1981, remained at its 1981 level up to 1991 and then recovered significantly from 1991 to 2001. Data from Labour Force Surveys suggest that in fact the increase in the employment rate continued past 2001.

The decline in the employment rate between 1971 and 1981, though attributable in part to the rise in the rate of unemployment, is mostly associated with the migration of the population (see Psacharopoulos, 1983) from rural areas where the employment rate was higher (41.6% of the total population in 1971), to urban areas, which had lower employment rates (32.3% of the total population in 1971). The total employment rate steadied between 1981 and 1991, although some differences can be noted between genders and age groups. More specifically, the male employment rate decreased, while there was an increase in the female rate. The decrease in the male employment rate reflects both the increase in the unemployment rate and the lower male labour force participation rate. The major contributing factors

to this development were the drop in the labour force participation of individuals aged 15-19 years —perhaps as a result of the lengthening of compulsory education and of the increased participation in educational activities— and the decrease in the labour force participation rates of men aged 45-55 years and 65 years or more. On the other hand, the female employment rate increased in spite of the rise in the rate of unemployment, reflecting an increased participation of women, especially in the age group of 25-40 years.

Table 7 clearly shows that the employment rate gap between Greece and the EU-15 in 2004 is attributable to lower employment rates recorded in Greece for women in all age groups and for young men and women.

Greece's lower female employment rate reflects both the higher percentage of economically inactive women, especially among those aged over 50, and the higher unemployment rate of women in the younger age groups. It is, of course, more than likely that the employment rate in Greece, especially for women, has been underestimated both because part of (male and female) employment is undeclared (e.g. for contribution evasion purposes) and because women frequently work without pay in family enterprises and therefore refrain from seeking alternative or additional paid employment.[34] Women are also discouraged from seeking remunerated employment because of the high opportunity cost of alternative employment owing to the wage discrimination against them (Papapetrou, 2004), and because of the low mar-

---

[34] This holds if family members who work without pay in the family business only work for a few hours per week, in which case they are not recorded as "unpaid family workers".

Table 6
Employment, unemployment and labour force participation rates, and proportion of the population aged 15-64 years: Greece and the EU-15, 1971-2001

	Employment rate (%)[1]			Unemployment rate (%)			Labour force participation rate (%)[2]			Proportion of population aged 15-64 years (%)		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Greece												
1971	35.8	53.2	19.2	3.1	2.9	3.9	58.1	86.1	31.3	63.7	63.6	64.0
1981	34.8	52.0	18.2	4.4	3.8	5.9	57.2	84.9	30.5	63.6	63.7	63.5
1991	34.8	49.0	20.9	8.1	6.3	12.0	56.5	77.2	35.7	67.1	67.7	66.4
2001	37.4	47.8	27.2	11.1	9.8	13.4	61.8	76.7	46.7	68.1	69.0	67.2
EU-15												
1971	40.3	53.8	27.5	2.4	2.2	2.9	65.4	88.5	44.3	63.1	62.1	64.0
1981	39.5	50.3	29.3	7.1	6.3	8.4	65.5	81.9	49.7	64.9	65.5	64.4
1991	42.1	51.5	33.2	7.7	6.5	9.5	68.1	83.3	54.0	67.1	66.1	68.0
2001	43.6	51.1	36.5	7.3	6.4	8.5	70.6	81.6	60.0	66.7	66.9	66.5

1 Ratio of employed to total population.
2 Labour force as a percentage of the population aged 15-64 years.
Sources: Population censuses, AMECO database and Employment in Europe 1998-2004.

Table 7
Employment and unemployment rates, and proportion of inactive population by gender and age group: Greece and EU-15, 2004[1]

	Employment rate (%)			Unemployment rate (%)			Proportion of inactive population (%)		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
15-24 years									
Greece	27.4	32.9	22.0	26.5	18.8	35.6	62.7	59.5	65.9
EU-15	39.5	42.4	36.6	16.2	16.0	16.4	52.8	49.5	56.2
25-49 years									
Greece	75.2	90.2	60.0	9.6	5.7	15.1	16.8	4.4	29.4
EU-15	78.2	86.9	69.5	7.6	6.7	8.6	15.4	6.9	24.0
50-64 years									
Greece	48.8	67.3	31.5	4.9	3.8	7.0	48.7	30.0	66.1
EU-15	53.3	63.0	43.8	6.7	6.5	6.9	42.9	32.6	53.0
15-64 years									
Greece	59.6	74.0	45.5	10.4	6.5	16.0	33.5	20.9	45.9
EU-15	64.5	72.4	56.6	8.4	7.7	9.2	29.6	21.5	37.7

1 Data refer to the second quarter and represent the share of the employed, unemployed and inactive in each age group in the population of the age group.
Source: Eurostat (New Cronos Database).

ginal health insurance benefits for an additional working family member (Burtless, 2002).

The shortage —relative to other countries— in childcare infrastructure (e.g., public nursery schools) and other social conventions (e.g. the fact that women usually do most of the house-work) have also contributed to the lower female labour market participation in Greece. Data from the 2001 Labour Force Surveys show that the per-centage of women in the 25-49 years age group who stated family obligations as a reason for not participating in the labour force was 1.4 times higher in Greece than in the EU-15.

The presentation made so far may have given the false impression that labour market participation does not depend on the performance of the econ-omy. The high rate of unemployment in the past few years has caused women to refrain from seek-ing employment, while part-time job opportuni-ties, which would enable them to combine work with family obligations, are limited.

As far as young people are concerned, their sig-nificantly lower employment rate reflects their limited participation in the labour market and their higher rate of unemployment. The former can be explained in part by the greater, relative to other countries, participation of this age group in educational programmes. Labour Force Survey data for the EU-15 indicate that on average from 1998 to 2004 the percentage of those aged 15-24 years who were economically inactive because they were still in education amounted to about 90% in Greece, compared to about 80% in the EU-15. As for the high rate of unemployment in this age group, explanations should be sought in the school-to-work transition mechanisms. As revealed

by an NSSG study conducted in 2000,[35] first-time job seekers usually take about three years after completing continuous education to find their first significant job.[36] The difficulty in finding employ-ment is also confirmed by data on the duration of unemployment, which show that half of the unemployed aged 15-24 years in Greece have been jobless for more than one year (long-term unemployed), compared to about 27% in the EU-15. Furthermore, in spite of the high unemploy-ment, SEV and NSSG data[37] confirm the existence of job vacancies, which points to shortcomings in the educational system and insufficient vocational and within-firm training. The NSSG survey, with data as recent as the fourth quarter of 2003, shows that in spite of the high rate of unemploy-ment there was a significant number of job vacan-cies in several sectors of economic activity. For instance, job vacancies accounted for roughly 4% of all jobs in the hotels and restaurants sector and for about 3% in wholesale and retail trade. The study conducted by SEV during the second quar-ter of 2004 on a sample of 374, mostly manufac-turing, firms found that employers were dissatis-fied with the educational system which, from their standpoint, failed to provide future employ-ees with the necessary knowledge and skills. In fact, 48% of the firms questioned stated that they faced a local shortage of tertiary education appli-cants, while 60% remarked that they even faced a

---

35 NSSG, "Transition from education to the labour market – Year 2000" (http://www.statistics.gr/gr_tables/S301_SJO_8_TB_AH_00_Y.htm)(in Greek only).
36 Continuous education is defined as beginning in primary school and continuing without an interruption of more than one year. The first significant job is defined as a job started after leav-ing continuous education, with a minimum duration of 6 months and involving a minimum of 20 hours per week.
37 NSSG, *Quarterly Job Vacancy Survey*, 4th quarter 2003, and SEV, *Study of the skills in demand for the period 2005-2007*, June 2004 (in Greek).

shortage in less educated applicants. Finally, as already mentioned, the number of part-time jobs, which could give young individuals the opportunity to acquire working experience, is limited.

As far as labour market prospects are concerned, it should be noted that the decrease in the rate of unemployment and the increase in labour force participation will become all the more important, as the proportion of the population aged 15-64 years is projected to decrease. According to NSSG projections,[38] the proportion of the population aged 15-64 years is expected from 2010 onwards to fall below the levels estimated for 2005. In fact, the forecasts for 2020 indicate that the proportion of the population aged 15-64 years will be 2.6 percentage points lower than in 2005.

6. Summary

The above analysis showed that labour productivity growth in Greece has gained considerable momentum in recent years, particularly in certain sectors of economic activity (e.g. transport and communications). This improvement is attributed to the increase in capital per worker but predominantly to "technological progress". The present analysis was not able to quantify the extent of productivity gains attributable to cyclical factors, such as the more intense use of production factors. However, sustaining these high rates of pro-

ductivity growth in the years ahead will depend on the degree to which the potential output of the economy has in creased as a result of the recent phase of robust economic growth. In any event, as productivity levels in Greece continue to lag behind the corresponding levels of the EU-15, it is imperative to establish the exact reasons for this gap. Possible explanations for Greece's lower productivity should be sought in the quality of the business environment, the lack of competition, the small size of Greek firms, the delay in the adoption of new technologies and the shortcomings of the educational system.

In addition to lower productivity, which is the main reason for the gap in per capita income with the EU-15, Greece also has a lower labour market participation rate. This mainly reflects the more advanced age of labour market entry and the lower participation of women compared to the EU-15 average. These differences are due to "cultural" factors, to the higher rate of unemployment and to the broader enrolment of young adults in educational activities. In view of the anticipated demographic developments, both productivity and the employment rate will have to increase if Greece's average income is to converge towards that of the EU-15.

---

38 Basic population projection scenario adopted by Eurostat in the context of the Europro2004 programme.

Appendix

I. Definitions and sources for variables appearing in the text

1. *Real per capita income:* calculated as gross domestic product (GDP) in euro, at constant prices (base year=1995) and based on the irrevocable exchange rate (1 euro=340.75 drs.), divided by the estimated population at mid-year.

   Sources: (a) Eurostat New Cronos Database (series b1gm, mio_nac_kp95) (b) Eurostat New Cronos Database (series ppavg) for the period 1970-2002 and NSSG estimates for 2003-04.

2. *Per capita income in purchasing power standards:* calculated as the ratio of GDP in purchasing power standards, over the national accounts population estimate.

   Source: Eurostat New Cronos Database (series b1gm, mio_pps and pop).

3. *Productivity per worker in the whole economy:* estimated as the ratio of GDP (as in 1 above) over the total number of workers.

   Sources: (a) See 1 (above) for the source of GDP data. (b) Employment data are based on the Labour Force Surveys, following adjustments to ensure consistency with population census data and to correct for the breaks in the labour force surveys in 1998 and 2004.

4. *Productivity per worker by sector:* calculated as the ratio of the sector's gross value added, at constant prices, over total employment in the sector.

Sources: (a) National accounts for value-added data ("mixed ESA system" for the period 1980-94, ESA 95 for the period 1995-2004). (b) Labour Force Surveys, once adjustments were made as in 3 above.

5. *Productivity per hour worked in the whole economy:* calculated as the ratio of GDP (as in 1 above) over the total number of hours worked.

   Sources: (a) See 1 (above) for the source of GDP data. (b) Data on hours worked were drawn from the National Accounts after necessary adjustments were made for the revision of employment figures from 1998 onwards, in accordance with the Labour Force Surveys.

6. *Net capital stock:* Data on real net capital stock were drawn from two sources:

   (a) For the total economy over the period 1970-2004, from the Annual Macroeconomic Indicators (AMECO) database of the European Commission.

   (b) For the primary and manufacturing sectors over the period 1971-89, from the Organisation of Economic Cooperation and Development (OECD, 1997).

7. *Gross fixed capital formation and depreciation by sector:* data in 1995 prices from OECD's Structural Indicators Database.

II. Productivity and per capita income developments in the EU-15

See Table A1.

T a b l e   A1
Average annual percentage change in per capita income and productivity, 1970-2004

	1970-79[1]		1980-89		1990-99		2000-04	
	Per capita income	Productivity	Per capita income	Productivity	Per capita income	Productivity	Per capita income	Productivity
Greece	2.7	2.7	0.6	0.5	1.3	1.0	4.0	2.8
Austria	3.6	3.1	2.2	2.3	2.2	2.1	1.2	1.1
Belgium	3.0	3.0	2.0	2.1	1.8	1.6	1.5	1.1
Denmark	1.8	1.8	1.4	1.0	1.8	1.7	1.2	1.7
Finland	3.3	3.6	3.2	2.7	0.9	2.4	2.7	1.8
France	2.7	2.9	1.9	2.2	1.5	1.6	1.6	0.9
Germany	2.8	2.8	1.7	0.9	1.3	1.5	1.1	0.9
Ireland	3.4	3.9	2.7	3.6	6.3	3.2	4.5	3.3
Italy	3.2	2.7	2.3	1.7	1.3	1.6	1.1	0.2
Netherlands	2.2	2.9	1.4	1.6	2.3	1.2	0.6	1.1
Portugal	3.5	4.6	3.0	3.3	2.6	2.2	0.4	0.3
Spain	2.7	4.2	2.3	2.3	2.4	1.2	1.8	0.6
Sweden	1.6	1.3	2.0	1.5	1.2	2.5	2.1	1.8
United Kingdom	2.3	2.0	2.2	1.8	1.9	2.0	2.3	1.9
EU-15	2.6	2.8	2.0	1.7	1.6	1.7	1.5	1.1

1 For Greece, the annual percentage changes in the first two columns refer to the period 1971-81.
Sources: AMECO database and Eurostat (New Cronos Database).

III. Results obtained using the Hodrick-Prescott (H-P)
filter

The H-P method is used to estimate the long-term trend of a variable and consists of minimising the sum of the squares of the deviation of the series (X_t) from its trend (T_t), under the constraint that the sum of the squares of the second differences of the trend (T_t) is nil.

$$\min \sum_{t=1}^{N}(X_t - T_t)^2 + \lambda \sum_{t=1}^{N}\left[(T_{t+1} - T_t) - (T_t - T_{t-1})\right]^2$$

The weight (λ) given to the constraint varies according to the desired degree of smoothing and depends on, *inter alia,* the frequency of the observations. For further details, see Hodrick and Prescott (1997), and Ravn and Uhlig (2002).

T a b l e A2

Long-term trend and cyclical variations in the rate of productivity change

(Percentages)

	Rate of change	Long-term trend	Cyclical variations
Annual data (λ=6.25)			
1982-1995	0.3	0.4	−0.1
1996-1999	2.0	1.8	+0.1
2000-2004	2.8	2.7	+0.1
Annual data (λ=100)			
1982-1995	0.3	0.5	−0.2
1996-1999	2.0	1.7	+0.3
2000-2004	2.8	2.6	+0.2
Quarterly data (λ=6.400)			
1996-1999	2.2	2.4	−0.2
2000-2004	2.8	2.7	+0.1
Quarterly data (λ=1.600)			
1996-1999	2.2	2.3	−0.1
2000-2004	2.8	2.7	+0.1

Note: The time periods examined roughly coincide with the time periods referred to in the analysis. The long-term trend was estimated using the Hodrick-Prescott filter.
Source: Estimates based on NSSG data, using Eviews 5.0.

References

Alogoskoufis, G. (1995), "The two faces of Janus: institutions, policy regimes and macroeconomic performance in Greece", *Economic Policy* 10:20, 149-92.

Bank of Greece, *Annual Report,* various years.

Bank of Greece (2005), *Monetary Policy 2004-2005*, February.

Barro, R. (1998), "Notes on growth accounting", *National Bureau of Economic Research Working Paper Series,* 6654.

Basu, S. (1996), "Procyclical productivity: increasing returns or cyclical utilization?", *Quarterly Journal of Economics* 111:3, 719-51.

Bosworth, B. and T. Kollintzas (2002), "Economic growth in Greece: past performance and future prospects" in R.C. Bryant, N.C. Garganas and G.S. Tavlas (ed.), *Greece's economic performance and prospects,* Bank of Greece & The Brookings Institution, Athens.

Browning, E.K. (1997), "A neglected welfare cost of monopoly and most other product market distortions", *Journal of Public Economics* 66:1, 127-44.

Burtless, G. (2002), "The Greek labour market" in R.C. Bryant, N.C. Garganas and G.S. Tavlas (ed.), *Greece's economic performance and prospects*, Bank of Greece & The Brookings Institution, Athens.

Conway, P., Janod, V. and G. Nicoletti (2005), "Product Market Regulation in OECD Countries: 1998 to 2003," OECD Working Paper No. 419.

Crafts, N. and O' Mahony, M. (2001), "A perspective on UK productivity performance", *Fiscal Studies* 22:3, 271-306.

European Commission (2004), *Business demography in Europe,* Office for Official Publications of the European Communities, Luxembourg.

Eurostat (2004), "Purchasing power parities and related economic indicators for EU, candidate countries and EFTA", *Statistics in Focus* 53/2004, Luxembourg.

Eurostat (2005), "GDP per capita varied by one to five across the EU25 Member States", *Press release 75/2005*, 3 June 2005.

Evans, D.S. and L.S. Leighton (1989), "Why do smaller firms pay less?", *Journal of Human Resources* 24:2, 299-3.

Gordon, R. (2004), "Five puzzles in the behavior of productivity, investment and innovation", mimeo, Northwestern University (http://faculty-web.at.northwestern.edu/economics/gordon/FivePuzzles.pdf).

Hall, R.E. (1988), "The relation between price and marginal cost in US industry", *Journal of Political Economy* 96:5, 921-47.

Harberger, A.C. (1954), "Monopoly and resource allocation", *American Economic Review* 44:2, 77-87.

Hodrick, R. J. and Prescott, E.C. (1997), "Post-war US business cycles: an empirical investigation", *Journal of Money, Credit and Banking* 29:1, 1-16.

Holtz-Eakin, D. (1994), "Public sector capital and the productivity puzzle", *Review of Economics and Statistics* 76:1, 12-21.

Inklaar, R. and R. McGuckin (2003), "Structural and cyclical performance", in O' Mahony, M. and B. van Ark, (ed.) *EU Productivity and Competitiveness: An industry perspective,* Office for Official Publications of the European Communities, Luxembourg.

Jorgenson, D.W. and K.J. Stiroh (2000), "Raising the speed limit: US economic growth in the Information Age", *Brookings Papers on Economic Activity* 2000:1, 125-211.

Layard, R.J. (2005), *Happiness: lessons from a new science*, Allen Lane, London.

Mihail, D. (1995), "The productivity slowdown in Greece", *Labour* 9:2, 189-205.

Ministry of National Economy (1999), *Bi-annual report,* December.

Nalebuff, B. and J. Stiglitz (1983), "Information, competition and markets", *American Economic Review* 73:2, 278-83.

Nickell, S.J. (2005), "How much spare capacity is there in the UK?", Bank of England (http://www.bankofengland.co.uk/publications/speeches/2005/sncapacity050531.pdf).

NSSG (1994), Industrial classification 1991 (STAKOD 1991), Athens.

OECD (1997), *Flows and stocks of fixed capital 1971-1996*, Paris.

OECD (2001), *Measuring productivity: OECD manual,* Paris.

OECD (2004a), *Employment Outlook,* Paris.

OECD (2004b), *Learning for tomorrow's world. First results from PISA 2003,* Paris.

OECD (2005a), *International comparisons of labour productivity levels – estimates for 2005,* Paris.

OECD (2005b), *Going for growth,* Paris.

Oi, W.Y. and T.L. Idson (1999), "Firm size and wages" in Ashenfelter, O. and D. Card (ed.) *Handbook of Labor Economics,* Vol. 3B, Elsevier, 2165-214, Amsterdam.

O' Mahony, M. and M. Timmer (2002), Measuring capital input, EPKE Technical Note 1, (http://www.niesr.ac.uk/research/epke/TN1.pdf).

Papapetrou, E. (2004), "Gender wage differentials in Greece", Bank of Greece, *Economic Bulletin,* No. 23, 47-64.

Pissarides, C., P. Garibaldi, C. Olivetti, B. Petrongolo and E. Wasmer (2005), "Women in the labor force: How well is Europe doing?'" in Boeri T., D. del Boca, and C. Pissarides (ed.) *Women at Work: An economic perspective,* Oxford University Press.

Porter, M. E. (1990), *The competitive advantage of nations,* Free Press, New York.

Psacharopoulos, G. (1983), "Sex discrimination in the Greek labor market", *Journal of Modern Greek Studies* 1:2, 339-58.

Ravn, M.O. and H. Uhlig (2002), "On adjusting the Hodrick-Prescott filter for the frequency of observations", *Review of Economics and Statistics* 84:2, 371-80.

Savva-Balfoussias, S. (2004) "Productivity growth in the Greek Business sector." (2004), in Lianos T. (ed.) *Essays in Economic Analysis,* KEPE-Papazisis, Athens.

SEV (2004), "Study of the skills in demand for the period 2005-2007", Athens (in Greek).

SEV-IOBE (2005), "Measuring the administrative and regulatory burden of Greek firms. Summary results of a pilot survey". http://www.fgi.org.gr/uploads/largefiles/ SEV_IOBE.pdf.

Van Reenen, J. (2001), "The new economy: reality and policy", *Fiscal Studies* 22:3, 307-36.

Yeaple, S. and S. Golub (2002), "International productivity differences, infrastructure and comparative advantage". Paper presented at the Trade and Development Workshop at the Yale Department of Economics on 16 December 2002 (http://www.econ. yale.edu/seminars/trade/tdw02/yeaple-021216.pdf).

Yörük, B. K. and O. Zaim (2005), "Productivity growth in OECD countries: a comparison with Malmquist indices", *Journal of Comparative Economics* 33:2, 401-20.

Zolotas, X.E. (1982). *Economic growth and declining social welfare,* Bank of Greece, Athens.

Working Papers

(January-July 2005)

This section contains the abstracts of Working Papers authored by Bank of Greece staff and/or collaborators and published by the Bank of Greece. The unabridged version of these publications is available in print or in electronic format at www.bankofgreece.gr.

Contents

List of Working Paper abstracts included in previous issues of the *Economic Bulletin*

Issue 22

1. Empirical modelling of money demand in periods of structural change: The case of Greece
   Sophocles N. Brissimis, George Hondroyiannis, P.A.V.B. Swamy and George S. Tavlas
2. Greek monetary economics in retrospect: The adventures of the drachma
   Sophia Lazaretou
3. The dynamic adjustment of a transition economy in the early stages of transformation
   Christos Papazoglou and Eric J. Pentecost
4. An indicator measuring underlying economic activity in Greece
   Stephen G. Hall and Nicholas G. Zonzilos
5. Changes in financial structure and asset price substitutability: A test of the bank lending channel
   Sophocles N. Brissimis and Nicholas S. Magginas
6. Capital flows and speculative attacks in prospective EU Member States
   Heather D. Gibson and Euclid Tsakalotos
7. The importance of variance stationarity in economic time series modelling: a practical approach
   Alexandros E. Milionis
8. The effect of dynamic hedging of options positions on intermediate-maturity interest rates
   Thanasis Christodoulopoulos and Ioulia Grigoratou

Issue 23

9. Cost efficiency in Greek banking
   Nicos C. Kamberoglou, Elias Liapis, George T. Simigiannis and Panagiota Tzamourani
10. Forward-looking information in VAR models and the price puzzle
    Sophocles N. Brissimis and Nicholas S. Magginas
11. EMU strategies: lessons from past experience in view of EU englargement
    Theodoros S. Papaspyrou
12. Wage rigidity and monetary union
    Harris Dellas and George S. Tavlas
13. Inflation persistence during periods of structural change: an assessment using Greek data
    George Hondroyiannis and Sophia Lazaretou
14. Econometric modelling at the Bank of Greece
    Nicholas G. Zonzilos

Issue 24

The Greek model of the European System of Central Banks multi-country model

Working Paper No. 20
Dimitrios Sideris and Nicholas Zonzilos

Econometric modelling has a long tradition at the Bank of Greece and econometric models have been used for both forecasting and policy analysis since the early 1970 when the first model of the Greek economy was developed in the Econometric Forecasting Unit, then headed by the now Governor of the Bank, Nicholas C. Garganas. Models are used extensively in the internal forecasting rounds of the Bank of Greece as well as in the context of the Eurosystem macroeconomic projection exercises. This paper presents a quarterly econometric model for the Greek economy, the GR-MCM model. This model has been developed as part of a larger project within the European System of Central Banks (ESCB), the Multi-Country Model (MCM).

The main characteristics of the Eurosystem multi-country model are:

(i) The broadly common specification of the all the national models belonging to the system.

(ii) The built-in exogeneity assumptions of the national models (especially for the modelling of the interest rates and the exchange rates), which allows the full multi-country model to be simulated in linked mode taking into account all international interdependencies, while area-wide policy rules are in operation.

The construction of an assumed constant parameter model for the Greek economy for the years 1980-2000 is a challenging task, given that the period analysed covers different monetary, fiscal and income policy regimes as well as significant structural changes and social transformation.

Taking on board the main prescriptions of the MCM-project, the Greek model combines short-run Keynesian dynamics determined by demand with a neo-classical steady state driven by supply factors. The model is consistent with the neoclassical framework, which assumes that the long-run equilibrium is determined by supply factors while demand factors affect output in the short run due to sluggish prices and quantities. The model is built around national income and product accounts using the ESA-95 system and has been fitted to quarterly observations covering the period 1980Q1 to 2000Q4. A critical feature of the GR-MCM is a well-specified consistent and simultaneously estimated long-run supply block. Output prices and factor (labour and capital) demands are derived from the profit maximisation of a representative firm, which faces an imperfectly competitive market and constant returns to scale for production derived from a Cobb-Douglas technology. The relevant theoretical restrictions concerning the long-run coefficients are imposed in the price, labour and capital stock equations, which are estimated jointly. The equilibrium relationships are then used to build the dynamic equations for domestic prices, employment and capital spending (investment). A bargaining type nominal wage equation closes the supply side of the model, while the non-accelerating inflation rate of unemployment (NAIRU) is

endogenously determined by the parameters of the model.

The consistency between aggregate demand and supply in long-run equilibrium is achieved through a stock-flow adjustment mechanism operating through the consumption function and the current account. Departures from equilibrium are eliminated through the wage-price mechanism, the real exchange rate and the real interest rate. As far as the econometric methodology is concerned, the equilibrium relationships are estimated using cointegration analysis, whereas the dynamic equations are specified as error correction models. Standard simulations carried out using the model, reveal plausible short- and long-run responses to exogenous shocks, thus indicating that the model can be useful for policy analysis experiments.

There is no monetary sector in the model. The specification of the public sector is rather limited with only a few behavioural equations. Public expenses are left exogenous while revenues are linked to nominal aggregates by implicit tax rates. The nominal exchange rate and short-term interest rate are assumed to be exogenous. Therefore, they can be used as policy instruments. The model is backward looking, with expectations treated implicitly by the inclusion of lagged variables.

The model can be simulated in isolated mode and as such is used in the Bank of Greece, providing useful insights in terms of overall responses to exogenous shocks.

Does corporate ownership structure matter for economic growth?

Panayotis Kapopoulos and Sophia Lazaretou

The role of corporations in allocating resources has been at the centre of the debate about the manner in which enterprises should be governed to enhance economic performance. The system of corporate governance determines, firstly, who makes investment decisions in the firm, secondly, what kinds of investments are made and, thirdly, how returns from investments are distributed. Corporate governance features seem to be central to the dynamics by which successful firms and economies improve their performance over time as well as relative to each other.

The standard definition of corporate governance refers to problems arising from the separation of ownership and control, namely, the agency relationship between a principal (investors in publicly-traded firms, voters for utilities) and an agent (managers for corporations, politicians for state-controlled firms). A divergence of interest between managers and shareholders (or between politicians and voters) may cause managers (politicians) to take actions that are costly to shareholders (voters).

In corporate finance considerable attention has focused on the impact —at the level of the firm— of ownership structure on economic performance. However, this linkage at the country level is a neglected area. In this paper, we try to clarify the relationship between corporate ownership structure and output growth by using the data of La Porta *et al.* (1999) on ownership structure of large and medium-sized corporations in 27 advanced economies. To search for empirical linkages, we use cross-country growth regressions for the period 1990-2002. The evidence provided in the paper suggests that an environment with a higher percentage of directly and indirectly widely-held companies and a lower degree of state than private ownership is associated with a higher growth rate of *per capita* income. We also conclude that a higher degree of institutional investment does not seem to enhance the growth performance of an economy.

Market power, innovative activity and exchange rate pass-through

Working Paper No. 22
Sophocles N. Brissimis and Theodora S. Kosma

Recent evidence indicates that exchange rate movements do not necessarily lead to a proportional change in traded goods prices even after a prolonged period of time. This puzzling empirical phenomenon —referred to as incomplete exchange rate pass-through— has been extensively analysed in the literature. Most of the studies attribute incomplete pass-through to the existence of market power by firms that sell their products in imperfectly competitive international markets. However, an issue that has not attracted much attention in the literature relates to the impact of the exchange rate on exporting firms' market power and through that on their incentive to adopt process innovation and on the implications for the exchange rate pass-through.

This paper introduces innovative activity of oligopolistic firms engaging in international trade, in addition to market power, as a determinant of pass-through. Specifically, a model is developed in which exporting firms' pricing and innovation decisions are endogenously and simultaneously determined. In this context, the links between the exchange rate, market power, innovative activity and price are important for the determination of the optimal degree of exchange rate pass-through. It is found that in the long run the pass-through elasticity can be less than, equal to or greater than one depending on the effectiveness of investment in process innovation but in any case it is higher than in models that do not endogenise innovation decisions. The empirical implications of the model are tested using data for Japanese firms exporting to the US market and applying the Johansen multivariate cointegration technique. Particular attention is given to the estimation and identification of the equilibrium price and process-innovation intensity equations. The empirical results indicate that price-setting and process-innovation intensity decisions of firms are jointly determined in the long run. This interdependence must be taken into account if an accurate estimate of the exchange rate pass-through is to be obtained.

Measuring liquidity in the Greek Government securities market

Working Paper No. 23
Thanasis N. Christodoulopoulos and Ioulia Grigoratou

HDAT (The Electronic Secondary Securities Market) started operating in May 1998 within the premises of the Bank of Greece. HDAT's trading system is electronic, quote-driven, and primary dealers are obliged to provide firm quotes and achieve a minimum of activity, on a yearly basis, in terms of transactions volume. As a rule, all dematerialised government debt is listed and traded on HDAT.

This is the first study dealing in a comprehensive and detailed way with liquidity in the Greek secondary market for government securities. The market has evolved as a two-tier market with an organised market (HDAT) being at the core and the over-the-counter market constituting the second tier.

We examine liquidity in HDAT over the period 1999-2003, by estimating six different measures for each of the three- five- ten- and twenty-year Greek Government benchmark bonds. The data used are high-frequency data which concern quotes and transactions data for the benchmark bonds. The liquidity measures are: the trading volume, trading frequency, trade size, bid-ask spread, the on/off-run yield spread and the price impact coefficient, which estimates the result on prices from net order flow. Most measures show a substantial improvement of liquidity between the pre-euro-area-entry and post-euro-area-entry period. The ten-year benchmark bond appears, by any of the measures employed, as the most liquid among the four benchmark bonds considered.

The bid-ask spread is the most important measure of liquidity in the pre-euro-area-entry period, while it becomes less important in the post-euro-area-entry period. The price impact coefficient emerges as an important measure of liquidity, particularly in the post-euro-area-entry period. The bid-ask spread and the price impact coefficient measures are correlated to a significant extent. An interesting finding is that, in HDAT, liquidity is only weakly related to price volatility, probably due to the specific structure of the government securities market in Greece. Therefore, trading activity is also found to be a good proxy of liquidity in this specific market.

Regional integration challenges in South East Europe: banking sector trends

George Stubos and Ioannis Tsikripis

This study reviews and evaluates a particular aspect of the institution building process in the transition countries of South East Europe. It focuses on the development of the banking sector and assesses its functions in recent years. First, it undertakes a brief literature review of regional integration approaches in the Balkans. Three main issues are examined: the reasons why integration needs to be promoted, the obstacles hindering integration efforts and the shortcomings of implemented regional integration initiatives.

Second, it provides an overview of the most significant changes that have taken place in the banking sector during the first decade of reform. This period saw the development of the commercial sector and the introduction of a legal and regulatory framework in conformity with international guidelines, standards and procedures. Reforms, however, proceeded more in terms of quantity rather than quality. The end of the first decade was marked by bank failures, scandals and transactional irregularities which threatened the very viability of the emerging system.

These conditions led to acute banking crises being experienced —to different degrees— by all Balkan countries between 1996 and 1998. This, in turn, led to a second round of reforms introduced by national governments. The third part of this study reviews some structural characteristics of the Balkan banking sector, such as ownership struc-

tures, and some performance indicators, such as level of implementation, loan portfolio quality, profitability trends and capitalisation ratios.

The data and information presented in this study provide strong evidence that rigorous and accelerated improvements in the banking sector have been achieved. Government reforms in recent years radically changed the ownership structure of the banking system and improved performance indicators. A very significant harmonisation of ownership structures and performance indicators has been emerging in all the Balkan countries. This manifests a common convergence pattern despite the fact that the transformation drive in each country proceeds at different speeds and by different methods. Overall, with the exception of a low level of intermediation, in all other respects the banking sectors in the Balkan countries resemble those of EU countries. To a great extent, this progress has been achieved because of the efforts of foreign investors. The Balkan experience shows that foreign investments, if concentrated collectively and in a timely and synchronised manner in a particular economic sector, can effectively redefine its structure and function. As far as regional integration is concerned, banking developments during the past few years point to a continental rather than a regional integration trend. Other studies, focusing on different areas of economic activity, point to the same conclusion.

Bank-specific, industry-specific and macroeconomic determinants of bank profitability

Panayiotis P. Athanasoglou, Sophocles N. Brissimis and Matthaios D. Delis

The aim of this study is to examine in a single equation framework the bank-specific, industry-specific and macroeconomic determinants of bank profitability. The group of bank-specific determinants involves operating efficiency and financial risk. Size is also included to account for the effect of economies of scale. The second group of determinants describes industry-structure factors that affect bank profits and are not the direct result of managerial decisions. These are industry concentration and the ownership status of banks. The Structure-Conduct-Performance (SPC) hypothesis figures prominently among theories that relate market power to bank profitability. The third group of determinants relates profitability to the macroeconomic environment within which the banking system operates. In this context, we include cyclical output and expected inflation among the explanatory variables.

Novel features of our study are the analysis of the effect of the business cycle on bank profitability and the use of an appropriate econometric methodology to account for profit persistence in banking.

To estimate the model, we utilise a panel of Greek commercial banks that covers the period 1985-2001. The empirical results show that profitability persists to a moderate extent, indicating that departures from perfectly competitive market structures may not be that large. All bank-specific determinants, with the exception of size, affect bank profitability significantly and in the anticipated way. The SCP hypothesis is not verified, as the effect of industry concentration on bank profitability was found insignificant. Altogether, the industry variables are not important in explaining bank profitability, even though the Greek banking system evolved dynamically during the sample period (sizeable changes in industry concentration, entry of new banks, privatisations and M&As) and the market share of publicly-owned banks remained high. Finally, the macroeconomic control variables clearly affect the performance of the banking sector. In particular, the evidence indicates that profitability is procyclical, although the effect of the business cycle is asymmetric, since it is significant only in the upward phase of the cycle.

Aggregate supply and demand, the real exchange rate and oil price denomination

Working Paper No. 26
Yiannis Stournaras

In a small open economy with imperfect competition in its labour and product markets, fiscal policy is effective under both floating and fixed exchange rates. The fiscal multiplier is larger under complete consumer wage indexation (real consumer wage rigidity) than under incomplete wage indexation (nominal wage rigidity) and under a fixed exchange rate than under a floating one. This is so because, under nominal wage rigidity, the appreciation of the nominal exchange rate due to higher government expenditure leads to an appreciation of the real exchange rate which mitigates the effects of government expenditure on output. Monetary policy is effective in a floating exchange rate regime only under nominal wage rigidity. Under real wage rigidity it has no effect on output. Supply side changes, such as a reduction in the (exogenous) wage pressure variable and in firm market power, a reduction in the international price of raw materials such as oil, an increase in the labour force, and an increase in the efficiency factor in production always boost competitiveness and output.

Fixing the international price of raw materials in the home currency introduces nominal inertia even under real wage rigidity and makes monetary policy effective under a floating exchange rate: an increase in money supply entails a currency depreciation, which reduces the real cost of imported raw materials and boosts output.

In a two, similar country world under a floating exchange rate, real consumer wage rigidity in both countries, and the price of raw materials fixed in the currency of Country 2, an expansionary monetary policy in Country 2 is a "locomotive" policy, that is, it increases output in both countries through a reduction in the world interest rate. An increase in money supply in Country 1 has no effect on output.

An increase in government expenditure in Country 1 has a positive effect on output in Country 1, an ambiguous effect on output in Country 2, while an increase in government expenditure in Country 2 produces ambiguous effects on both countries' output. A simultaneous increase in government expenditure in both countries has a positive impact on both countries' output, while the real exchange rate remains unaffected.

These results may explain certain characteristics and have certain implications for economic policy in the US and the euro area.

Monetary policy and financial system supervision measures

(January - July 2005)

Monetary policy measures of the Eurosystem

13 January 2005

The Governing Council of the ECB decides that the minimum bid rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility will remain unchanged at 2.0%, 3.0% and 1.0% respectively.

14 January 2005

The Governing Council of the ECB decides to increase the allotment amount for each of the longer-term refinancing operations to be conducted in the year 2005 from €25 billion to €30 billion. This increased amount takes into consideration the higher liquidity needs of the euro area banking system anticipated in 2005. The Eurosystem will however continue to provide the bulk of liquidity through its main refinancing operations.

3 February, 3 March, 7 April, 4 May, 2 June, 7 July 2005

The Governing Council of the ECB decides that the minimum bid rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility will remain unchanged at 2.0%, 3.0% and 1.0% respectively.

Bank of Greece decisions concerning the establishment and operation of credit institutions and the supervision of the financial system

19 January 2005

Alpha Bank is authorised to acquire 100% of the share capital of the Belgrade-based "Jubanka a.d. Beograd".

26 January 2005

— The provisioning ratios on claims (i) from non-performing loans one year past due or in permanent arrears and (ii) from doubtful consumer loans are increased, respectively, from 70% to 90% and from 84% to 100%. At the same time, the provisioning ratio on performing loans secured by collateral in the form of residential property is lowered from 0.7% to 0.5%, provided that the amount of the loan does not exceed 70% of the objective value of the residential property.

— The provisioning ratios applying to the part of the outstanding guarantees of the Guarantee Fund for Small and Very Small Enterprises (TEMPME S.A.) that is counter-guaranteed by the European Investment Fund are set at 20% of the respective minimum provisioning ratios.

25 February 2005

— The National Bank of Greece is authorised to establish and operate 15 new branches in Serbia-Montenegro.

— Alpha Bank is authorised to establish and operate one new branch in Albania.

11 March 2005

— The operating framework and the assessment criteria concerning credit institutions' internal audit systems are amended and specified, while the powers of the bodies responsible for internal audit are defined.

— Piraeus Bank is authorised to acquire the majority of the share capital of the Sofia-based "Eurobank a.d."

— Piraeus Bank is authorised to acquire 100% of the share capital of the Belgrade-based "Atlas Bank a.d."

23 March 2005

"Famanet Hellas S.A. Financial Information Services" is authorised to operate as a money transfer intermediary.

1 April 2005

The Bank of Greece supervisory framework for the liquidity adequacy of credit institutions is amended and minimum compulsory ratios are set.

14 April 2005

— For cooperative banks, the threshold for reporting large exposures is lowered from 10% to 5% of own funds.

— Alpha Bank is authorised to establish 12 new branches in Bulgaria.

— EFG Eurobank is authorised to acquire 100% of the share capital of "HC Istanbul Holding A.S."

17 May 2005

Piraeus Bank is authorised to acquire 100% of the share capital of the Cairo-based "Egyptian Commercial Bank".

19 July 2005

Bank of Greece Governor's Act 2563/19 July 2005 amends and codifies Bank of Greece Governor's Act 1313/9 June 1988 and subsequent amending Bank of Greece decisions and circulars specifying the information required from credit institutions for supervisory purposes. The new supervisory disclosure framework, finalised following a consultation with credit institutions, facilitates credit institutions' supervision reporting and enhances the efficiency of Bank of Greece supervision.

Decisions of the Bank of Greece

Re: Amendments to Bank of Greece Governor's Act 2438/1998, as currently in force, concerning the operating framework and assessment criteria for credit institutions' Internal Control Systems and the responsibilities of credit institutions' internal audit functions (Banking and Credit Committee decision 193/1/11 March 2005)

The Banking and Credit Committee, having regard to:

a) Article 18 of Law 2076/1992 re: "Taking up and pursuit of the business of credit institutions, and other related provisions", as currently in force;

b) Bank of Greece Governor's Act 2438/1998, as currently in force, concerning the operating framework and assessment criteria for credit institutions' Internal Control Systems and the responsibilities of credit institutions' internal audit functions, in particular Section VI thereof on the basic principles and criteria for information systems;

c) Bank of Greece Governor's Act 1313/9 June 1988 "Data to be reported by credit institutions to the Bank of Greece for the purpose of monitoring their solvency, liquidity and profitability", as currently in force, in particular List 1 of Table C1 concerning persons having a special relation with the credit institution;

d) the recommendation of the Bank of Greece's Department for the Supervision of Credit and Related Financial Institutions dated 21 February 2005;

e) the need to specify further the above frame-

work in order to ensure the more efficient and secure operation of information systems, which are a key parameter of credit institutions' operational risk management, especially in view of the development of e-banking;

f) the need to ensure, through appropriate internal approval procedures within credit institutions, that the terms and conditions for lending to related parties are in line with the institution's recorded standard credit policy (arm's length basis);

has decided to supplement the provisions of Bank of Greece Governor's Act 2438/6 August 1998 as follows:

1. The requirement of detailed recording of the operating terms and procedures of the credit institution under Section III of Bank of Greece Governor's Act 2438/1998 shall also apply to any form of credit to, or participations of, related parties (as defined in List 1 of Table C1 of Bank of Greece Governor's Act 1313/1988, as applicable), so as to ensure that:

    a) the terms and conditions for such credit are equivalent to those applicable to the corresponding categories of credit to non-related borrowers, and

    b) any such participation or credit is made with the prior approval of the Board of Directors or by a decision of the General Meeting of shareholders of the credit institution, as stipulated in the law.

    To facilitate the financing of business firms falling within the notion of related parties as

above, the Board of Directors of the credit institution may set a reasonable credit limit, up to which only an *ex post* notification to the Board of Directors will be required instead of the prior approval of the latter.

2. The related parties referred to in paragraph 1 above shall advise the Board of Directors of the credit institution concerned of the outstanding amount of credit they have received from enterprises affiliated with the credit institution, in the sense of Article 42e of Law 2190/1920, as currently in force, within 20 days of the end of each calendar year. This requirement shall be independent from the obligation of the credit institution to report to the Bank of Greece the relevant outstanding credit under Bank of Greece Governor's Act 1313/1988, as applicable.

3. a) The Annex* to this decision, which shall henceforth be an integral part of Bank of Greece Governor's Act 2438/6 August 1998 (as supplemented hereby), specifies the core principles for the secure and efficient operation of information systems, to be complied with by credit institutions with total assets in excess of one hundred million euro (€100,000,000).

   b) The Department for the Supervision of Credit and related Financial Institutions is hereby authorised to further specify the provisions of Bank of Greece Governor's Act 2438/6 August 1998, as supplemented hereby, as well as the scope of compliance with the principles contained in the Annex in the case of

---

* The annex, not reproduced here, is available in the Government Gazette, 77/30 March 2005, Issue A (in Greek).

credit institutions with total assets falling short of the amount specified hereinabove (€100,000,000).

The provisions of Bank of Greece Governor's Act 2438/6 August 1998, as currently in force, shall remain unchanged in all other respects.

* * *

Re: Framework for the supervision of the liquidity adequacy of credit institutions (Bank of Greece Governor's Act 2560/1 April 2005)

The Governor of the Bank of Greece, having regard to:

a) Articles 55A, 55B, 55C and 55D of the Statute of the Bank of Greece;

b) Articles 12, 18 and 19 of Law 2076/1992 re: "Taking up and pursuit of the business of credit institutions, and other related provisions", as currently in force;

c) Annex IX of Law 2155/1993 re: Ratification of the agreement on the European Economic Area (EEA)", as currently in force;

d) Bank of Greece Governor's Acts 1312/9 June 1988 and 1313/9 June 1988, as currently in force, on data to be reported by credit institutions to the Bank of Greece for the purpose of monitoring their solvency, liquidity and profitability;

e) Bank of Greece Governor's Act 2156/10 December 1992, as currently in force, concerning the reporting of liquidity data by credit institutions for supervisory purposes;

f) Bank of Greece Governor's Act 2258/2 November 1993, as currently in force, regarding the operating framework and supervision of credit institutions operating as credit cooperatives under Law 1677/1986;

g) Bank of Greece Governor's Act 2438/1998, as currently in force, "Operating framework and assessment criteria for credit institutions' Internal Control Systems and the responsibilities of credit institutions' internal audit functions";

h) the need to revise the supervisory framework for credit institutions' liquidity in line with the changing conditions and best international practices;

has decided as follows:

A. Liquidity ratios

1. Compulsory liquidity ratios are hereby introduced, in the form of minimum limits that should be observed by credit institutions, as follows:

a) Liquid Asset Ratio: this is calculated by dividing the cumulative stock of "liquid assets" for the maturity band from overnight up to 30 days, as reported in Table B of Annex I, by "deposit and other short-term liabilities", as reported in Table B of Annex I.

This ratio shall not be less than:

(i) 15% until 30 September 2005; and

(ii) 20% from 1 October 2005 onwards.

b) Mismatch Ratio: this is calculated by dividing the cumulative stock of "assets net of liabilities" within the shortest maturity band, from overnight up to 30 days, as reported in Table B of Annex I, by "deposit and other short-term liabilities", as reported in Table B of Annex I.

The minimum mismatch ratio (attention is drawn to the negative sign) shall be:

(i) -25% until 30 September 2005; and

(ii) -20% from 1 October 2005 onwards.

2. Asset and liability items shall be classified in maturity bands, as specified in Tables A1 and A2 of Annex I hereof and the corresponding instructions, and the resulting ratios shall be reported in Table B of the said Annex.

3. Tables A1, A2 and B of Annex I shall report aggregate data for all currencies, on an unconsolidated basis, including data for foreign branches of credit institutions established in Greece.

B. Reporting to the Bank of Greece

1. Within twenty days of the end of each quarter, credit institutions shall report to the Bank of Greece (Department for the Supervision of Credit and related Financial Institutions) quarterly data, as per Tables A1, A2 and B below, referring to the last business day of the quarter.

2. Moreover, within 30 days of the end of each calendar year, they shall report forecasts of the following year's data, as per Tables A1 and A2, marked as "forecast figures".

3. The first reporting shall concern data as at 30 September 2005.

C. Compliance with minimum limits

1. Credit institutions shall at all times maintain the minimum liquidity ratios and shall notify the Bank of Greece (Department for the Supervision of Credit and related Financial Institutions) of any significant shortfall (of more than two percentage points) against the minimum ratios referred to in paragraph 1 of Section A above. Liquidity data (Tables A1, A2 and B) shall be at the disposal of the Bank of Greece and the relevant records shall be kept for two years.

2. In the above notification, credit institutions shall also state the reasons for such shortfall, as well as the measures that they have taken or intend to take for restoring their liquidity ratios to the required level.

D. Basic principles for liquidity risk management

Credit institutions must have in place liquidity risk management systems conforming with the principles detailed in Annex II to the present Act.

E. Branches of credit institutions established in other countries

In accordance with the provisions of Law 2076/1992, as currently in force (Articles 19 and 12), the requirements laid down in the preceding sections shall also apply to branches in Greece of credit institutions whose registered offices are located in European Economic Area (EEA) countries or in third (non-EEA) countries.

The Bank of Greece may, on a case-by-case basis, exempt branches of foreign credit institutions from these requirements, provided that the foreign credit institution undertakes vis-à-vis the Bank of Greece a commitment to fulfil the branch's individual liquidity requirements in an equivalent manner.

F. Other provisions

a) Annexes I, II and II shall constitute an integral part of the present Act.

b) The Department for the Supervision of Credit and related Financial Institutions is authorised to provide clarifications and instructions, as necessary, regarding the application of the present Act, as well as on the application of Section E hereof, concerning the coverage by

foreign credit institutions of the liquidity needs of their branches in Greece.

c) The present Act shall enter into force on 1 July 2005; as from that date, Bank of Greece Governor's Act 2156/10 December 1992, as currently in force, shall be repealed.

ANNEXES*

I. A) LIQUIDITY TABLES
   B) CLASSIFICATION OF ASSETS/LIABILITIES
II. BASIC PRINCIPLES FOR LIQUIDITY RISK MANAGEMENT
III. LISTS OF COUNTRIES

---

* These annexes, not reproduced here, are available at the website of the Bank of Greece: www.bankofgreece.gr (in Greek).

Statistical
section

Tables

T a b l e I.1

Consumer price index

(Percentage changes with respect to the corresponding period of the previous year)

| Period | General index | General index excluding food and fuel | General index excluding fresh fruit/vegetables and fuel | Goods | Services | Sub-indices | | |
						Food and non-alcoholic beverages	Fresh fruit and vegetables	Fuel
2001	3.4	3.7	3.8	3.2	3.7	5.1	9.2	−4.8
2002	3.6	3.6	3.6	3.2	4.3	5.3	13.8	−1.7
2003	3.5	3.1	3.2	3.1	4.2	5.0	10.7	3.9
2004	2.9	3.2	3.3	2.3	3.8	0.5	−11.9	7.5
2002 I	4.0	3.4	3.3	4.0	3.9	9.9	43.2	−7.4
II	3.5	3.9	3.9	3.0	4.4	4.7	9.0	−4.9
III	3.5	3.6	3.7	2.7	4.6	4.0	4.5	−0.4
IV	3.6	3.5	3.5	3.0	4.5	2.9	1.0	6.7
2003 I	3.8	3.4	3.6	3.4	4.5	2.3	−5.4	15.9
II	3.7	3.0	3.1	3.4	4.1	8.3	27.6	−2.4
III	3.4	2.9	3.0	2.9	4.1	6.1	19.2	0.9
IV	3.2	3.3	3.2	2.5	4.3	3.3	4.6	1.9
2004 I	2.7	3.2	3.3	1.8	4.0	3.3	2.6	−5.7
II	2.9	3.2	3.3	2.3	3.9	−0.7	−16.3	11.6
III	2.8	3.4	3.4	2.1	3.9	−1.3	−22.8	9.6
IV	3.2	2.9	3.0	2.9	3.5	0.8	−11.3	15.5
2005 I	3.3	3.5	3.3	3.1	3.6	−0.6	−11.5	15.1
II	3.3	3.1	3.0	3.0	3.8	−0.3	−12.4	18.1
2002 Jan.	4.4	3.2	3.3	5.2	3.3	12.9	59.0	−6.4
Feb.	3.4	3.2	3.1	3.1	3.9	8.6	38.1	−10.3
March . .	4.0	3.7	3.6	3.8	4.4	8.1	33.4	−5.5
Apr.	3.8	3.5	3.4	4.0	3.6	7.2	26.7	−2.9
May	3.8	4.3	4.2	2.4	4.9	3.0	−0.6	−6.8
June . . .	3.3	3.8	3.9	2.5	4.5	3.9	2.2	−4.8
July	3.3	3.5	3.7	2.7	4.4	3.9	1.7	−1.0
Aug. . . .	3.5	3.6	3.6	2.9	4.5	4.2	6.1	0.5
Sept. . . .	3.5	3.8	3.7	2.7	4.8	3.9	5.8	−0.8
Oct. . . .	3.7	3.6	3.5	3.2	4.6	4.1	8.1	4.3
Nov. . . .	3.6	3.5	3.5	3.1	4.5	4.0	6.3	4.0
Dec. . . .	3.4	3.5	3.5	2.8	4.3	0.8	−9.1	12.1
2003 Jan.	3.1	3.6	3.7	2.1	4.7	−1.4	−19.6	13.7
Feb.	4.3	3.5	3.8	4.1	4.7	3.7	−0.5	18.6
March . .	4.1	3.1	3.4	4.1	4.1	4.7	5.5	15.4
Apr.	3.4	3.1	3.4	2.6	4.5	5.8	10.9	−1.9
May	3.8	2.8	2.9	3.9	3.7	10.3	40.2	−3.7
June . . .	3.8	3.0	3.0	3.6	4.2	8.9	34.6	−1.6
July	3.6	2.9	2.9	3.2	4.1	7.4	28.5	0.5
Aug. . . .	3.3	2.9	3.0	2.8	4.0	5.6	17.0	1.6
Sept. . . .	3.3	3.1	3.2	2.8	4.2	5.2	12.6	0.7
Oct. . . .	3.2	3.2	3.2	2.5	4.2	3.7	4.9	1.1
Nov. . . .	3.3	3.2	3.1	2.9	4.1	3.3	5.6	6.3
Dec. . . .	3.1	3.4	3.3	2.2	4.5	3.0	3.2	−1.4
2004 Jan.	2.9	3.2	3.2	2.3	3.9	3.5	4.9	−3.0
Feb.	2.5	3.1	3.1	1.5	4.0	3.7	4.7	−8.7
March . .	2.7	3.3	3.4	1.8	4.2	2.8	−1.3	−5.4
Apr.	2.9	3.2	3.2	2.3	3.9	0.4	−10.2	8.3
May	2.9	3.2	3.3	2.4	3.8	−1.0	−17.4	14.9
June . . .	2.8	3.3	3.5	2.1	3.9	−1.5	−20.9	11.7
July	2.9	3.8	3.8	2.2	4.0	−2.5	−28.2	10.0
Aug. . . .	2.7	3.1	3.2	1.9	4.0	−0.7	−20.3	9.2
Sept. . . .	2.8	3.2	3.3	2.2	3.7	−0.7	−19.5	9.5
Oct. . . .	3.2	3.0	3.0	3.1	3.5	0.3	−13.6	17.5
Nov. . . .	3.1	2.9	3.1	2.8	3.6	0.2	−16.2	16.7
Dec. . . .	3.1	2.8	2.9	2.8	3.5	1.9	−4.1	12.1
2005 Jan.	4.0	4.5	4.2	4.3	3.7	0.6	−8.9	10.3
Feb.	3.1	3.2	3.0	2.8	3.6	−0.9	−12.1	16.4
March . .	2.9	2.9	2.7	2.4	3.6	−1.3	−13.1	18.4
Apr.	3.4	3.1	3.0	3.1	3.8	−0.1	−11.0	19.7
May	3.2	3.3	3.2	2.7	4.0	−0.4	−12.3	14.9
June . . .	3.3	3.0	3.0	3.1	3.7	−0.5	−14.1	19.9

Source: Calculations based on National Statistical Service of Greece (NSSG) data (CPI 1999=100).

Table I.2

Table I.2

Industrial producer price index (PPI) for the domestic market:
general index and basic sub-indices

Period	PPI – domestic market (General index)		Energy (total)		Fuels		General index excl. energy	
	(2000=100)	Percentage change over previous year	(2000=100)	Percentage change over previous year	(2000=100)	Percentage change over previous year	(2000=100)	Percentage change over previous year
2001	103.6	3.6	97.1	−2.9	93.7	−6.3	105.1	5.1
2002	106.0	2.3	99.2	2.1	93.3	−0.4	107.6	2.3
2003	108.5	2.3	101.0	1.8	91.6	−1.8	110.2	2.5
2004	112.3	3.5	105.0	4.0	95.6	4.3	115.4	4.7
2004 I	109.8	1.3	100.2	−3.6	86.6	−15.9	114.0	4.3
II	112.3	4.4	104.6	6.0	95.3	11.0	115.6	5.3
III	113.3	4.4	107.1	6.5	99.9	10.8	116.0	5.0
IV	113.8	4.1	108.2	7.4	100.5	14.7	116.3	4.3
2005 I	114.8	4.6	110.1	9.9	103.0	19.0	116.9	2.6
2003 Jan.	108.0	3.5	103.0	7.2	100.7	15.6	109.0	2.5
Feb. ...	108.8	4.3	105.1	9.6	106.4	22.6	109.3	2.8
March ..	108.6	3.1	103.6	5.8	101.7	10.2	109.6	2.3
Apr. ...	107.7	1.6	99.1	−0.3	87.2	−9.5	109.8	2.2
May ...	107.4	1.4	97.9	−1.0	83.5	−11.9	109.8	2.1
June ...	107.7	2.0	99.1	1.3	86.7	−5.2	109.8	2.2
July	108.2	2.2	100.6	2.4	91.6	0.6	109.9	2.2
Aug. ...	108.5	2.0	100.6	0.2	91.5	−2.2	110.4	2.5
Sept. ...	108.9	1.7	100.6	−1.6	87.3	−12.1	110.9	2.6
Oct. ...	109.2	1.8	101.3	−1.1	89.5	−10.2	111.1	2.7
Nov. ...	109.5	2.5	101.1	1.2	88.6	−3.1	111.6	2.9
Dec. ...	109.3	2.0	99.9	−1.4	84.7	−11.6	111.7	2.9
2004 Jan.	109.3	1.2	99.9	−3.0	86.2	−14.4	113.3	4.0
Feb. ...	109.5	0.7	99.2	−5.6	84.5	−20.6	114.0	4.3
March ..	110.6	1.8	101.4	−2.1	89.1	−12.4	114.6	4.5
Apr. ...	111.9	3.9	103.4	4.3	92.9	6.4	115.5	5.2
May ...	112.9	5.1	106.4	8.7	99.0	18.5	115.7	5.3
June ...	112.2	4.2	104.1	5.1	93.9	8.3	115.6	5.4
July	112.8	4.3	105.9	5.3	97.5	6.5	115.7	5.3
Aug. ...	113.4	4.5	107.5	6.9	100.7	10.0	116.0	5.1
Sept. ...	113.7	4.4	107.9	7.3	101.5	16.3	116.2	4.8
Oct. ...	114.9	5.2	111.8	10.3	109.5	22.3	116.3	4.7
Nov. ...	114.0	4.1	108.2	7.1	99.7	12.5	116.5	4.4
Dec. ...	112.6	3.0	104.5	4.6	92.2	9.0	116.0	3.9
2005 Jan.	113.6	3.9	107.0	7.1	96.9	12.5	116.4	2.7
Feb. ...	114.5	4.6	109.1	10.0	101.2	19.8	116.9	2.5
March ..	116.4	5.3	114.2	12.6	110.9	24.6	117.4	2.5
Apr. ...	117.6	5.1	116.6	12.8	115.9	24.9	118.1	2.2
May ...	117.1	3.7	114.7	7.8	112.0	13.2	118.1	2.1

Source: NSSG.

T a b l e I.3

Industrial producer price index (PPI) for the external market and wholesale price index
(imported products)

| Period | PPI – external market | | | | Wholesale price index | | Wholesale price index excl. energy | |
| | General index | | General index excl. energy | | | | | |
	(2000=100)	Percentage change over previous year	(2000=100)	Percentage change over previous year	(1995=100)	Percentage change over previous year	(1995=100)	Percentage change over previous year
2001	100.7	0.7	103.4	3.4	120.7	1.9	119.8	2.3
2002	101.8	1.1	105.1	1.6	121.2	0.4	120.6	0.7
2003	101.5	−0.3	104.4	−0.6	122.5	1.1	121.6	0.9
2004	106.6	5.0	106.3	1.8	123.1	0.5	122.0	0.3
2004 I	104.4	2.3	105.9	2.5	122.5	0.0	121.7	0.3
II	107.0	7.4	106.9	3.4	123.1	0.6	122.1	0.5
III	107.7	6.0	106.5	1.8	123.2	0.5	122.0	0.2
IV	107.3	4.4	106.0	−0.4	123.7	0.9	122.3	0.4
2005 I	107.2	2.7	105.9	0.0	124.2	1.4	122.9	0.9
2003 Jan.	101.7	0.8	103.3	−2.1	122.4	1.4	121.4	1.0
Feb. . . .	102.5	1.5	103.2	−2.4	122.7	1.6	121.4	1.1
March . .	102.1	0.1	103.5	−1.8	122.7	1.4	121.3	0.8
Apr. . . .	99.8	−2.9	103.5	−1.9	122.4	1.0	121.6	0.9
May . . .	99.0	−3.1	103.2	−2.0	122.3	0.9	121.5	0.9
June . . .	99.9	−1.4	103.4	−1.3	122.3	1.0	121.5	0.9
July	101.2	0.3	104.2	−0.3	122.4	1.2	121.6	1.1
Aug. . . .	102.0	0.2	104.4	−0.6	122.6	1.0	121.8	0.9
Sept. . . .	101.6	−1.4	105.2	0.1	122.7	0.9	121.9	0.9
Oct. . . .	102.9	0.0	106.3	1.2	122.6	0.9	121.8	0.8
Nov. . . .	103.1	1.9	106.7	1.9	122.6	0.9	121.8	0.7
Dec. . . .	102.5	0.8	106.6	2.1	122.5	0.6	121.6	0.5
2004 Jan.	104.2	2.4	105.6	2.3	122.4	0.0	121.5	0.1
Feb. . . .	103.9	1.3	105.8	2.5	122.5	−0.1	121.7	0.2
March . .	105.2	3.0	106.3	2.6	122.7	0.0	121.9	0.4
Apr. . . .	106.6	6.8	107.0	3.4	123.2	0.7	122.2	0.5
May . . .	107.8	8.9	107.0	3.7	123.1	0.7	122.1	0.5
June . . .	106.6	6.7	106.7	3.2	123.0	0.6	122.0	0.4
July	107.3	6.0	106.6	2.3	123.1	0.5	122.0	0.3
Aug. . . .	107.8	5.7	106.4	2.0	123.1	0.3	121.9	0.1
Sept. . . .	108.1	6.4	106.5	1.2	123.5	0.7	122.1	0.2
Oct. . . .	108.8	5.8	106.3	0.0	123.8	0.9	122.3	0.4
Nov. . . .	107.4	4.1	106.1	−0.5	123.7	0.8	122.3	0.4
Dec. . . .	105.7	3.1	105.7	−0.8	123.5	0.9	122.3	0.5
2005 Jan.	106.2	2.0	105.7	0.1	123.8	1.1	122.5	0.8
Feb. . . .	106.9	2.9	106.0	0.2	124.2	1.4	122.9	1.0
March . .	108.5	3.1	105.9	−0.3	124.7	1.6	123.2	1.1
Apr. . . .	109.1	2.4	106.0	−0.9	125.2	1.6	123.5	1.1
May . . .	109.1	1.2	106.3	−0.6	125.1	1.6	123.5	1.2

Source: NSSG.

Industrial production index (2000=100)

(Percentage changes with respect to the corresponding period of the previous year)

| Period | Industry | | | | Main categories of goods | | | | |
	General index	Manu-facturing	Mining-quarrying	Electricity-town gas-water supply	Energy	Inter-mediate goods	Capital goods	Consumer durables	Consumer non-durables
2001	−1.8	−2.5	2.4	−0.1	−0.3	−0.5	−13.0	−14.4	0.7
2002	0.8	−0.1	9.7	1.8	2.3	1.6	−7.2	−15.4	2.3
2003	0.3	−0.4	−5.2	5.8	2.9	−0.4	0.8	−3.6	−1.4
2004	1.2	1.2	0.3	1.4	0.3	1.0	−0.5	1.8	2.7
2003 II.	0.9	0.3	−5.8	6.7	2.9	−2.0	9.4	−8.5	0.4
III	1.6	0.8	−3.8	7.1	6.4	−0.6	8.5	−0.3	−2.4
IV	0.1	−0.5	−0.1	3.0	−1.8	3.0	−2.7	−0.2	0.1
2004 I	2.1	1.3	5.9	4.2	2.2	0.2	8.2	−0.9	2.8
II.	2.3	3.1	9.3	−3.5	−0.5	4.6	−0.3	19.7	2.4
III	0.9	1.5	−5.7	1.1	−0.5	−0.5	−1.3	2.6	4.4
IV	−0.8	−1.3	−7.5	3.9	0.0	−0.4	−6.7	−12.5	1.0
2005 I	−1.6	−1.4	−11.0	0.6	−2.3	−0.5	−0.2	11.8	−3.2
2002 July	0.7	−0.5	1.6	5.4	1.7	1.2	1.8	−14.3	0.0
Aug.	−1.5	−2.4	7.5	−1.3	1.2	0.4	1.8	−19.9	−5.4
Sept.	−1.2	−0.5	−2.7	−3.7	−4.6	1.7	0.7	−4.3	−1.4
Oct.	−0.2	0.0	5.2	−2.9	−0.1	0.4	2.2	−10.8	−0.8
Nov.	1.3	−0.5	17.1	3.9	5.8	−1.5	0.8	−14.4	1.3
Dec.	7.0	7.2	25.0	1.9	3.0	8.1	16.4	−26.2	11.3
2003 Jan.	1.6	4.6	−8.8	−5.6	−1.6	8.8	−9.4	9.3	0.1
Feb.	−3.6	−6.4	−16.0	15.1	6.9	−5.8	−21.1	−9.1	−5.9
March.	−2.1	−3.9	−8.9	10.4	7.2	−6.8	−2.2	−11.6	−5.0
Apr.	−1.9	−3.3	−0.8	5.0	6.1	−7.4	−1.2	−20.6	−1.9
May	3.6	2.9	−8.0	12.1	10.3	−1.0	9.2	−6.3	1.7
June	1.0	1.2	−7.9	3.5	−6.5	2.4	19.3	2.8	1.4
July	1.9	2.4	−6.0	2.8	3.0	1.6	7.2	1.8	−0.3
Aug.	−2.4	−5.3	−4.1	8.8	6.1	−5.3	1.1	−0.8	−9.7
Sept.	4.9	4.3	−1.4	10.8	10.6	0.8	14.4	−1.8	2.3
Oct.	0.6	−0.5	0.3	6.3	−2.0	1.7	−3.5	2.4	3.2
Nov.	−2.6	−2.8	−11.5	2.0	−4.5	2.4	−6.8	−0.6	−5.0
Dec.	2.5	2.0	14.5	1.0	0.9	5.3	1.5	−2.3	2.3
2004 Jan.	−2.0	−5.0	−1.4	9.9	6.1	−9.8	10.8	−23.5	−4.2
Feb.	2.9	3.2	6.7	0.7	0.7	2.1	5.1	0.0	6.2
March.	5.1	5.2	12.0	2.5	0.1	7.7	9.1	16.1	5.9
Apr.	3.8	3.9	13.1	−0.2	−2.2	6.3	2.6	17.2	6.8
May	2.7	4.4	4.7	−6.1	−2.7	6.8	5.6	20.2	1.5
June	0.6	0.9	10.3	−4.0	3.5	0.9	−7.2	21.2	−0.9
July	2.3	2.8	3.9	0.0	0.0	1.3	7.9	12.2	3.5
Aug.	0.5	2.2	−13.8	−0.4	−3.1	−3.6	−4.7	6.5	9.4
Sept.	−0.2	−0.4	−7.3	3.8	1.7	−0.1	−8.4	−8.1	1.1
Oct.	−3.7	−5.1	−2.2	1.9	−3.5	−3.4	−8.3	−13.8	−2.2
Nov.	2.1	2.3	−9.1	5.6	1.8	1.4	1.7	−14.7	4.8
Dec.	−0.5	−0.8	−11.7	4.3	1.4	1.2	−12.1	−8.9	0.8
2005 Jan.	0.3	0.1	−4.2	2.2	1.4	3.9	−7.1	26.0	−4.4
Feb.	0.6	2.1	−8.7	−2.6	−4.7	0.7	16.1	19.1	1.0
March.	−5.2	−5.8	−18.6	2.2	−3.5	−5.2	−8.3	−1.6	−6.3
Apr.	−3.0	−3.6	−13.1	3.9	−7.7	−1.3	−4.9	22.1	−1.6
May*	−2.3	−3.2	−7.4	4.6	3.2	−4.0	−5.3	4.9	−4.9

* Provisional data.
Source: NSSG.

Table I.5

Retail sales volume (retail trade turnover at constant prices)

(Percentage changes with respect to the corresponding period of the previous year)

| Period | General index | Sub-indices | | | |
		Food-beverages-tobacco	Clothing and footwear	Furniture and fixtures	Books-stationery-other items
2001	4.4	2.3	3.3	4.7	5.9
2002	4.8	4.5	3.6	4.6	5.3
2003	4.3	5.3	0.9	3.8	7.5
2004	4.5	7.1	1.4	3.9	4.7
2003 I	6.6	7.8	−3.5	13.8	7.3
II	2.6	1.3	10.5	−1.8	11.5
III	4.7	4.5	4.2	2.8	8.6
IV	3.5	7.7	−4.9	1.6	3.2
2004 I	4.9	6.2	0.6	5.7	6.5
II	5.0	7.8	−1.4	6.1	4.6
III	4.7	8.1	3.2	3.4	5.4
IV	3.5	6.5	3.1	0.9	2.8
2005 I	2.8	8.2	0.3	−4.8	−4.9
2002 Oct.	5.4	6.4	7.7	0.8	4.0
Nov.	4.8	6.4	3.9	2.2	0.0
Dec.	7.2	7.9	1.5	5.2	5.0
2003 Jan.	8.2	9.6	−4.2	19.7	11.7
Feb.	4.5	7.0	−8.5	10.2	3.5
March	7.2	6.7	5.0	11.0	6.3
Apr.	4.2	4.2	12.3	−8.0	21.2
May	1.8	−0.8	12.3	1.7	8.1
June	1.7	0.3	6.2	1.4	5.3
July	2.0	−0.2	5.5	2.0	3.1
Aug.	7.2	8.7	0.1	4.4	11.9
Sept.	5.2	5.3	6.5	2.2	11.2
Oct.	3.2	6.8	−5.7	5.6	1.3
Nov.	6.4	9.3	1.3	2.8	9.5
Dec.	1.4	7.2	−8.7	−2.4	0.4
2004 Jan.	3.0	7.2	−3.8	−3.4	2.2
Feb.	6.5	4.8	5.6	12.9	10.0
March	5.5	6.4	0.2	9.0	8.0
Apr.	5.8	8.6	−3.5	9.7	4.9
May	4.3	6.7	−5.3	7.9	4.5
June	5.0	8.2	5.7	1.3	4.5
July	6.4	13.6	2.5	2.2	3.6
Aug.	3.3	3.4	4.9	4.7	7.9
Sept.	4.3	7.6	2.5	3.4	5.2
Oct.	6.3	9.9	7.9	3.4	4.7
Nov.	2.7	6.1	0.4	−0.4	4.6
Dec.	2.0	4.2	1.8	−0.1	0.1
2005 Jan.	−2.8	6.7	−17.6	−14.8	−8.2
Feb.	4.7	7.4	14.8	−3.0	−4.3
March	6.7	10.7	3.8	4.2	−2.0
Apr.	3.5	4.1	1.2	2.4	−4.6

Sources: NSSG and Eurostat. Revised index of retail sales volume (on the basis of a new sample of NSSG for the year 2000).

Table I.6

Gross value added at basic prices and gross domestic product at market prices

	Million euro	Annual percentage changes (at constant prices of year 1995)				
	1995	2000	2001	2002	2003	2004
Primary sector (agriculture)	7,277	−4.2	−4.1	−1.3	−4.2	10.8
Secondary sector	16,550	5.4	6.4	2.2	5.9	0.6
Mining and quarrying	476	23.2	2.2	8.5	−4.8	0.8
Manufacturing	9,572	4.6	3.3	2.4	2.4	−1.6
Electricity - natural gas - water supply	1,751	4.8	1.3	1.8	6.3	1.9
Construction	4,751	5.7	14.4	1.4	12.3	3.6
Tertiary sector	50,031	5.1	5.2	3.7	6.0	4.9
Trade	10,018	3.1	11.4	1.2	11.1	−2.5
Hotels - restaurants	4,821	5.4	6.2	5.2	6.9	1.9
Transport - communications	4,978	16.2	1.3	5.9	6.3	15.1
Financial intermediaries	3,112	10.0	5.9	−5.2	8.9	5.2
Real estate management and other activities	12,577	3.5	3.5	1.8	2.9	4.5
Public administration - security	5,308	−2.8	1.0	8.4	−4.3	10.9
Education	3,298	1.6	−1.2	12.2	12.4	0.3
Health	3,855	3.0	2.6	6.5	4.9	7.9
Miscellaneous services	2,064	7.6	15.2	6.9	5.7	6.8
Gross value added at basic prices	73,858	4.4	4.8	3.1	5.2	4.4
Financial services indirectly measured (FISIM)	−2,175	13.7	12.1	−9.1	12.5	5.9
Gross value added (excluding FISIM)	71,683	4.1	4.5	3.6	4.9	4.4
Private consumption	58,405	2.0	3.0	3.1	4.0	3.3
Public consumption	12,250	14.8	−3.2	8.3	−2.3	6.5
Gross fixed capital formation	14,867	8.0	6.5	5.7	13.7	4.9
Housing	4,031	−4.3	4.8	8.8	7.3	0.2
Other constructions	5,391	8.9	8.2	0.7	13.2	6.3
Equipment	4,680	14.1	4.9	6.9	18.3	5.8
Other	765	7.6	20.1	21.0	3.4	7.4
Change in stocks and statistical discrepancy (as a percentage of GDP)	251	0.7	0.1	0.0	0.1	0.2
Domestic final demand	85,774	5.6	2.3	4.3	5.4	4.2
Exports of goods and services	14,087	14.1	−1.0	−7.7	1.0	10.0
Exports of goods	8,344	8.7	−1.6	−7.1	4.2	−1.3
Exports of services	5,743	18.2	−0.7	−8.1	−1.3	18.4
Final demand	99,861	7.2	1.7	2.1	4.7	5.1
Imports of goods and services	19,934	15.1	−5.2	−2.9	4.8	8.2
Imports of goods	18,084	15.2	−6.3	3.2	6.6	8.1
Imports of services	1,849	14.4	−0.4	−26.5	−5.2	8.8
GDP at market prices	79,927	4.5	4.3	3.8	4.7	4.2

Sources: NSSG/National Accounts, March 2005 (provisional estimates for the years 2000-2004).

T a b l e II.1

Balance of payments

(Million euro)

	January – May			May		
	2003	2004	2005*	2003	2004	2005*
I CURRENT ACCOUNT BALANCE (I.A+I.B+I.C+I.D)	**−5,385.6**	**−4,360.3**	**−6,005.8**	**−819.4**	**−712.6**	**−574.9**
I.A TRADE BALANCE *(I.A.1– I.A.2)*	***−9,420.6***	***−10,080.4***	***−11,127.4***	***−1,877.2***	***−2,022.8***	***−2,053.7***
Oil trade balance	−1,950.4	−1,790.8	−2,371.8	−263.4	−401.2	−436.1
Non-oil trade balance	−7,470.2	−8,289.6	−8,755.6	−1,613.8	−1,621.6	−1,617.6
Ship balance	−19.3	300.3	−227.8	−7.4	75.7	107.6
Trade balance excluding oil and ships	−7,450.9	−8,589.9	−8,527.8	−1,606.4	−1,697.3	−1,725.2
I.A.1 *Exports of goods*	*4,488.9*	*4,898.5*	*5,480.5*	*861.4*	*962.9*	*1,229.2*
Oil	595.4	528.3	660.0	83.1	99.3	153.3
Ships (receipts)	26.9	405.5	941.1	0.0	96.5	229.1
Other	3,866.6	3,964.7	3,879.5	778.3	767.1	846.9
I.A.2 *Imports of goods*	*13,909.6*	*14,978.9*	*16,607.9*	*2,738.6*	*2,985.8*	*3,282.9*
Oil	2,545.8	2,319.1	3,031.8	346.5	500.5	589.4
Ships (payments)	46.2	105.2	1,168.8	7.4	20.8	121.4
Other	11,317.6	12,554.6	12,407.3	2,384.7	2,464.5	2,572.1
I.B SERVICES BALANCE *(I.B.1– I.B.2)*	***2,624.9***	***4,008.5***	***4,179.4***	***1,018.6***	***1,381.9***	***1,451.8***
I.B.1 *Receipts*	*6,341.6*	*8,403.8*	*8,888.2*	*1,774.2*	*2,230.3*	*2,444.7*
Travel	1,610.2	1,852.0	1,972.0	832.2	954.0	985.0
Transport	3,820.3	5,361.3	5,872.6	772.4	1,079.2	1,233.2
Other	911.2	1,190.5	1,043.6	169.6	197.1	226.6
I,B,2 *Payments*	*3,716.7*	*4,395.3*	*4,708.9*	*755.6*	*848.4*	*992.9*
Travel	651.9	809.5	931.0	168.1	194.0	215.0
Transport	1,947.5	2,269.7	2,469.1	371.6	418.5	510.6
Other	1,117.3	1,316.1	1,308.8	215.9	235.9	267.3
I.C INCOME BALANCE *(I.C.1– I.C.2)*	***−1,359.9***	***−1,429.3***	***−1,650.6***	***−290.1***	***−301.4***	***−380.2***
I.C.1 *Receipts*	*1,000.0*	*986.8*	*1,166.1*	*166.7*	*174.2*	*226.8*
Wages, salaries	137.9	114.8	111.4	28.1	20.0	20.6
Interest, dividends, profits	862.1	872.0	1,054.7	138.5	154.2	206.2
I.C.2 *Payments*	*2,359.9*	*2,416.1*	*2,816.7*	*456.7*	*475.6*	*607.0*
Wages, salaries	64.4	72.5	85.2	12.8	17.5	20.2
Interest, dividends, profits	2,295.5	2,343.6	2,731.6	443.9	458.2	586.8
I.D TRANSFERS BALANCE *(I.D.1– I.D.2)*	***2,770.1***	***3,141.0***	***2,592.8***	***329.2***	***229.7***	***407.2***
I.D.1 *Receipts*	*3,765.0*	*4,233.4*	*4,356.2*	*522.3*	*447.8*	*671.8*
General government (EU transfers)	2,804.7	3,223.3	3,453.2	335.5	244.9	464.8
Other (emigrants' remittances, etc.)	960.3	1,010.0	903.0	186.8	202.9	207.0
I.D.2 *Payments*	*994.9*	*1,092.4*	*1,763.4*	*193.1*	*218.1*	*264.6*
General government	777.3	827.7	1,335.5	151.6	170.3	163.5
Other	217.6	264.7	427.9	41.6	47.8	101.2
II FINANCIAL ACCOUNT BALANCE (II.A+II.B+II.C+II.D)	**5,439.7**	**4,697.7**	**5,956.4**	**1,236.9**	**1,039.5**	**646.9**
II.A DIRECT INVESTMENT [1]	***−768.6***	***439.0***	***−66.4***	***−332.9***	***−46.9***	***−121.6***
By residents abroad	−336.9	−209.9	−330.2	−33.9	−52.1	−106.2
By non-residents in Greece	−431.7	649.0	263.8	−299.0	5.1	−15.4
II.B PORTFOLIO INVESTMENT [1]	***10,138.0***	***5,675.3***	***6,926.2***	***3,457.5***	***−3,041.8***	***1,166.9***
Assets	−4,563.8	−5,172.2	−7,607.5	120.2	−3,237.8	−1,343.6
Liabilities	14,701.8	10,847.4	14,533.8	3,337.3	195.9	2,510.4
II.Γ OTHER INVESTMENT [1]	***−8,147.7***	***−2,609.6***	***−1,187.4***	***−2,132.7***	***4,021.2***	***−438.3***
Assets	−3,595.0	−3,701.4	−14,093.3	−1,061.8	1,931.6	−2,709.9
Liabilities	−4,552.7	1,091.8	12,905.9	−1,070.9	2,089.6	2,271.6
(General government loans)	−1,628.0	−207.0	440.2	−136.8	−52.6	−69.8
II.D CHANGE IN RESERVE ASSETS [2]	***4,218.0***	***1,193.0***	***284.0***	***245.0***	***107.0***	***40.0***
III ERRORS AND OMISSIONS	**−54.1**	**−337.4**	**49.5**	**−417.5**	**−326.9**	**−72.1**
RESERVE ASSETS [3]				*4,796.0*	*3,412.0*	*1,710.0*

1 (+) net inflow, (–) net outflow.
2 (+) decrease, (–) increase.
3 Reserve assets, as defined by the European Central Bank, include only monetary gold, the reserve position at the IMF, the special drawing rights and the Bank of Greece claims in foreign currency on residents of non-euro area countries. Conversely, reserve assets do not include claims in euro on residents of non-euro area countries, claims in foreign currency and in euro on residents of euro area countries, and the Bank of Greece participation in the capital and the reserve assets of the ECB.
* Provisional data.
Source: Bank of Greece.

T a b l e II.2

Effective exchange rate of the euro calculated on the basis of Greece's external trade*

(Period averages)

| Period | Index (1990=100) | Percentage changes over:[1] | |
		Previous period	Previous year
1997	64.3	−1.9	−1.9
1998	60.5	−5.9	−5.9
1999	59.9	−0.9	−0.9
2000	56.2	−6.2	−6.2
2001	55.9	−0.6	−0.6
2002	56.4	0.9	0.9
2003	58.0	2.9	2.9
2004	58.5	0.8	0.8
2003 I	57.5	1.2	2.8
II	58.2	1.2	3.5
III	58.1	−0.2	2.6
IV	58.2	0.3	2.5
2004 I	58.5	0.5	1.8
II	58.2	−0.6	0.01
III	58.4	0.3	0.5
IV	58.8	0.8	1.0
2005 I	58.9	0.1	0.6
II	58.6	-0.5	0.6
2003 Jan.	57.3	0.6	2.4
Feb.	57.6	0.4	3.0
March	57.7	0.2	3.2
Apr.	57.8	0.2	3.3
May	58.4	1.1	3.9
June	58.4	0.1	3.4
July	58.2	−0.3	2.8
Aug.	58.1	−0.3	2.7
Sept.	58.0	−0.2	2.4
Oct.	58.1	0.3	2.5
Nov.	58.1	−0.1	2.2
Dec.	58.5	0.7	2.6
2004 Jan.	58.6	0.2	2.3
Feb.	58.6	−0.1	1.8
March	58.4	−0.4	1.3
Apr.	58.1	−0.5	0.5
May	58.3	0.4	−0.2
June	58.2	−0.1	−0.3
July	58.3	0.2	0.2
Aug.	58.4	0.01	0.5
Sept.	58.4	0.1	0.8
Oct.	58.6	0.3	0.9
Nov.	58.8	0.3	1.3
Dec.	59.0	0.4	0.9
2005 Jan.	58.9	−0.3	0.4
Feb.	58.8	−0.1	0.4
March	59.0	0.2	1.0
Apr.	58.8	−0.2	1.3
May	58.6	−0.3	0.6
June	58.2	−0.7	−0.01

* The effective exchange rate is the value of a representative basket of foreign currencies, each of which is weighted on the basis of its importance in the country's external trade. Up to end-2000, the effective exchange rate of the drachma was calculated weighting the individual bilateral exchange rates of the drachma against the other currencies, as these rates were formulated in the foreign exchange market. On 1 January 2001, Greece adopted the euro. In the present table, the weighting of the euro exchange rate vis-à-vis the other currencies is calculated on the basis of the country's non-oil external trade. As from January 2001, the change in the index is limited, since trade with the 11 other euro area countries (which accounts for a large share of total trade) is conducted in euro. This index should not be confused with the effective exchange rate of the euro, which is calculated on the basis of the external trade of the euro area as a whole.

1 A positive sign indicates an appreciation of the euro, while a negative sign a depreciation.

Source: Bank of Greece.

T a b l e II.3

Bilateral exchange rates of the euro*

(Units of national currency per euro, period averages)

Period	US dollar	Percentage change over: Previous period	Previous year	Japanese yen	Percentage change over: Previous period	Previous year	Danish krone	Percentage change over: Previous period	Previous year	Pound sterling	Percentage change over: Previous period	Previous year
1997	1.134	−10.7	−10.7	137.1	−0.7	−0.7	7.48	1.7	1.7	0.692	−14.9	−14.9
1998	1.121	−1.1	−1.1	146.4	6.8	6.8	7.50	0.2	0.2	0.676	−2.3	−2.3
1999	1.066	−4.9	−4.9	121.3	−17.2	−17.2	7.44	−0.8	−0.8	0.659	−2.6	−2.6
2000	0.924	−13.3	−13.3	99.5	−18.0	−18.0	7.45	0.1	0.1	0.609	−7.6	−7.6
2001	0.896	−3.1	−3.1	108.7	9.3	9.3	7.45	0.03	0.03	0.622	2.1	2.1
2002	0.945	5.5	5.5	118.1	8.6	8.6	7.43	−0.3	−0.3	0.629	1.1	1.1
2003	1.131	19.7	19.7	131.0	10.9	10.9	7.43	0.003	0.003	0.692	10.1	10.1
2004	1.243	9.9	9.9	134.4	2.6	2.6	7.44	0.1	0.1	0.679	−1.9	−1.9
2002 I	0.876	−2.1	−5.1	116.0	4.8	6.4	7.43	−0.1	−0.4	0.615	−1.0	−2.8
II	0.919	4.9	5.3	116.5	0.4	8.8	7.43	0.04	−0.3	0.629	2.3	2.3
III	0.984	7.0	10.4	117.3	0.7	8.3	7.43	−0.1	−0.2	0.635	1.0	2.6
IV	1.000	1.7	11.7	122.5	4.4	10.7	7.43	−0.0004	−0.2	0.636	0.2	2.5
2003 I	1.074	7.3	22.5	127.7	4.2	10.1	7.43	0.03	−0.02	0.670	5.3	9.0
II	1.136	5.9	23.7	134.7	5.5	15.6	7.43	−0.1	−0.1	0.701	4.7	11.6
III	1.124	−1.1	14.3	132.1	−1.9	12.7	7.43	0.1	0.04	0.699	−0.4	10.0
IV	1.189	5.8	18.9	129.5	−2.0	5.7	7.44	0.1	0.1	0.697	−0.2	9.6
2004 I	1.251	5.2	16.5	134.0	3.5	5.0	7.45	0.2	0.3	0.680	−2.5	1.5
II	1.204	−3.7	6.0	132.1	−1.4	−1.9	7.44	−0.1	0.2	0.667	−1.9	−4.9
III	1.222	1.5	8.7	134.4	1.7	1.7	7.44	−0.04	0.1	0.672	0.8	−3.8
IV	1.296	6.1	9.0	137.1	2.0	5.9	7.43	−0.03	−0.03	0.695	3.4	−0.3
2005 I	1.311	1.1	4.8	137.0	−0.04	2.2	7.44	0.1	−0.1	0.694	−0.2	2.0
II	1.260	−3.9	4.6	135.5	−1.1	2.5	7.45	0.04	0.1	0.679	−2.2	1.7
2003 Jan. . . .	1.063	4.4	20.3	126.2	1.6	7.8	7.43	0.1	−0.004	0.657	2.4	6.6
Feb. . . .	1.077	1.4	23.8	128.6	1.9	10.6	7.43	−0.01	0.02	0.670	1.9	9.5
March .	1.081	0.3	23.4	128.2	−0.3	11.8	7.43	−0.1	−0.1	0.683	1.9	10.8
Apr. . . .	1.085	0.4	22.5	130.1	1.5	12.4	7.43	−0.03	−0.1	0.689	0.9	12.2
May . . .	1.158	6.8	26.3	135.8	4.4	17.2	7.42	−0.01	−0.1	0.713	3.5	13.5
June . .	1.166	0.7	22.2	138.1	1.6	17.2	7.43	0.01	−0.1	0.702	−1.5	9.1
July . . .	1.137	−2.5	14.6	135.0	−2.2	15.3	7.43	0.1	0.04	0.700	−0.3	9.7
Aug. . .	1.114	−2.0	13.9	132.4	−1.9	13.8	7.43	−0.01	0.1	0.699	−0.2	9.9
Sept. . .	1.122	0.7	14.4	128.9	−2.6	8.9	7.43	−0.1	0.003	0.697	−0.3	10.5
Oct. . .	1.169	4.2	19.2	128.1	−0.6	5.4	7.43	0.04	0.01	0.698	0.1	10.7
Nov. . .	1.170	0.1	16.9	127.8	−0.2	5.1	7.44	0.1	0.1	0.693	−0.7	8.7
Dec. . .	1.229	5.0	20.7	132.4	3.6	6.6	7.44	0.1	0.2	0.702	1.3	9.3
2004 Jan. . . .	1.261	2.7	18.7	134.1	1.3	6.3	7.45	0.1	0.2	0.692	−1.4	5.3
Feb. . . .	1.265	0.3	17.4	134.8	0.5	4.8	7.45	0.04	0.3	0.677	−2.2	1.1
March .	1.226	−3.0	13.5	133.1	−1.2	3.9	7.45	−0.02	0.3	0.671	−0.8	−1.7
Apr. . . .	1.199	−2.3	10.5	129.1	−3.0	−0.8	7.44	−0.1	0.2	0.665	−0.9	−3.4
May . . .	1.201	0.2	3.7	134.5	4.2	−1.0	7.44	−0.04	0.2	0.672	0.9	−5.8
June . .	1.214	1.1	4.1	132.9	−1.2	−3.8	7.43	−0.1	0.1	0.664	−1.1	−5.4
July . . .	1.227	1.1	7.9	134.1	0.9	−0.7	7.44	0.02	0.03	0.666	0.2	−5.0
Aug. . .	1.218	−0.7	9.3	134.5	0.3	1.6	7.44	0.01	0.1	0.669	0.5	−4.3
Sept. . .	1.222	0.3	8.9	134.5	−0.02	4.3	7.44	0.02	0.1	0.681	1.8	−2.2
Oct. . .	1.249	2.2	6.8	136.0	1.1	6.1	7.44	−0.003	0.1	0.691	1.5	−0.9
Nov. . .	1.299	4.0	11.0	136.1	0.1	6.5	7.43	−0.1	−0.1	0.699	1.0	0.8
Dec. . .	1.341	3.2	9.1	139.1	2.2	5.1	7.43	0.03	−0.1	0.695	−0.5	−1.0
2005 Jan. . . .	1.312	−2.2	4.0	135.6	−2.5	1.1	7.44	0.1	−0.1	0.699	0.5	0.9
Feb. . . .	1.301	−0.8	2.9	136.5	0.7	1.3	7.44	0.03	−0.1	0.690	−1.3	1.9
March .	1.320	1.4	7.7	138.8	1.7	4.3	7.45	0.05	−0.04	0.692	0.4	3.1
Apr. . . .	1.294	−2.0	8.0	138.8	0.002	7.6	7.45	0.04	0.1	0.683	−1.4	2.6
May . . .	1.269	−1.9	5.7	135.4	−2.5	0.7	7.44	−0.08	0.1	0.684	0.2	1.8
June . .	1.216	−4.2	0.2	132.2	−2.3	−0.5	7.44	0.01	0.1	0.669	−2.2	0.7

* To 31 December 1998, rates for the ECU; from 1 January 1999, rates for the euro. A positive sign indicates an appreciation of the euro, while a negative sign a depreciation. On 1 January 2001, Greece adopted the euro. Therefore, the evolution of the exchange rate of the drachma vis-à-vis the currencies of non-euro area countries is identical with the evolution of the exchange rate of the euro vis-à-vis these currencies. Up to end-2001, however, the differentiation observed in the annual rates of change is attributable to the deviation of the drachma from its central parity in 2000.
Sources: Bank of Greece and European Central Bank (ECB).

T a b l e II.3 (continued)
Bilateral exchange rates of the euro*
(Units of national currency per euro, period averages)

Period	Swedish krona	Percentage change over: Previous period	Previous year	Swiss franc	Percentage change over: Previous period	Previous year	Norwegian krone	Percentage change over: Previous period	Previous year	Australian dollar	Percentage change over: Previous period	Previous year	Canadian dollar	Percentage change over: Previous period	Previous year
1997	8.65	1.6	1.6	1.644	4.9	4.9	8.02	−2.2	−2.2	1.528	−5.9	−5.9	1.569	−9.4	−9.4
1998	8.92	3.1	3.1	1.622	−1.3	−1.3	8.47	5.6	5.6	1.787	17.0	17.0	1.665	6.1	6.1
1999	8.81	−1.2	−1.2	1.600	−1.4	−1.4	8.31	−1.8	−1.8	1.652	−7.6	−7.6	1.584	−4.9	−4.9
2000	8.45	−4.1	−4.1	1.558	−2.6	−2.6	8.11	−2.4	−2.4	1.589	−3.8	−3.8	1.371	−13.4	−13.4
2001	9.26	9.5	9.5	1.510	−3.1	−3.1	8.05	−0.8	−0.8	1.732	9.0	9.0	1.387	1.1	1.1
2002	9.16	−1.0	−1.0	1.467	−2.9	−2.9	7.51	−6.7	−6.7	1.737	0.2	0.2	1.483	6.9	6.9
2003	9.12	−0.4	−0.4	1.521	3.6	3.6	8.00	6.5	6.5	1.738	0.1	0.1	1.582	6.7	6.7
2004	9.12	0.003	0.003	1.544	1.5	1.5	8.37	4.7	4.7	1.689	−2.8	−2.8	1.617	2.2	2.2
2002 I	9.16	−3.4	1.7	1.473	−0.001	−3.9	7.81	−2.0	−4.8	1.692	−3.3	−2.8	1.397	−1.3	−0.9
II	9.16	−0.02	0.3	1.465	−0.6	−4.1	7.52	−3.7	−6.2	1.666	−1.5	−2.2	1.428	2.2	6.1
III	9.23	0.8	−2.0	1.464	−0.1	−2.8	7.40	−1.6	−7.6	1.796	7.8	3.5	1.536	7.6	11.7
IV	9.09	−1.5	−4.0	1.467	0.2	−0.5	7.32	−1.1	−8.2	1.792	−0.3	2.4	1.570	2.2	10.9
2003 I	9.18	1.0	0.3	1.466	−0.02	−0.5	7.58	3.5	−3.0	1.809	1.0	6.9	1.620	3.2	16.0
II	9.14	−0.4	−0.1	1.518	3.5	3.6	7.96	5.0	5.8	1.774	−1.9	6.5	1.589	−1.9	11.3
III	9.16	0.2	−0.7	1.545	1.8	5.6	8.25	3.7	11.5	1.709	−3.7	−4.9	1.553	−2.2	1.1
IV	9.01	−1.7	−0.9	1.554	0.6	5.9	8.22	−0.3	12.4	1.661	−2.8	−7.3	1.566	0.8	−0.2
2004 I	9.18	1.9	−0.01	1.569	0.9	7.0	8.64	5.0	14.0	1.633	−1.7	−9.7	1.649	5.3	1.8
II	9.15	−0.4	0.03	1.538	−2.0	1.3	8.26	−4.3	3.9	1.689	3.4	−4.8	1.637	−0.8	3.0
III	9.16	0.1	−0.06	1.536	−0.1	−0.6	8.39	1.5	1.7	1.723	2.0	0.8	1.600	−2.3	3.0
IV	9.01	−1.6	0.05	1.534	−0.2	−1.3	8.20	−2.3	−0.3	1.713	−0.6	3.1	1.582	−1.1	1.0
2005 I	9.07	0.7	−1.18	1.549	1.0	−1.3	8.24	0.5	−4.6	1.687	−1.5	3.3	1.608	1.6	−2.5
II	9.21	1.5	0.68	1.544	−0.3	0.4	8.05	−2.3	−2.6	1.639	−2.8	−2.9	1.568	−2.5	−4.2
2003 Jan. ...	9.18	0.9	−0.5	1.462	−0.4	−0.8	7.34	0.6	−7.4	1.822	0.8	6.6	1.636	3.1	15.8
Feb. ...	9.15	−0.3	−0.4	1.467	0.3	−0.7	7.54	2.8	−3.1	1.811	−0.6	6.8	1.630	−0.4	17.4
March .	9.23	0.9	1.8	1.470	0.1	0.1	7.85	4.0	1.7	1.795	−0.9	7.5	1.594	−2.2	14.7
Apr. ...	9.15	−0.8	0.2	1.496	1.8	2.1	7.83	−0.2	2.7	1.781	−0.8	7.7	1.585	−0.6	13.2
May ...	9.16	0.02	−0.7	1.516	1.3	4.0	7.87	0.5	4.7	1.787	0.3	7.2	1.602	1.0	12.7
June ..	9.12	−0.4	0.04	1.541	1.7	4.7	8.16	3.7	10.2	1.755	−1.8	4.6	1.580	1.6	8.1
July ...	9.19	0.7	−0.9	1.548	0.4	5.8	8.29	1.6	11.9	1.718	−2.1	−4.1	1.569	−0.7	2.4
Aug. ...	9.24	0.6	−0.1	1.540	−0.5	5.2	8.26	−0.4	11.1	1.711	−0.4	−5.2	1.557	−0.8	1.5
Sept. ..	9.07	−1.8	−1.1	1.547	0.5	5.6	8.20	−0.7	11.3	1.697	−0.9	−5.4	1.533	−1.5	−0.7
Oct. ..	9.01	−0.6	−1.0	1.549	0.1	5.7	8.23	0.4	12.1	1.687	−0.6	−5.4	1.549	1.0	0.1
Nov. ..	8.99	−0.2	−1.0	1.559	0.7	6.2	8.20	−0.4	12.0	1.634	−3.1	−8.5	1.536	−0.8	−2.4
Dec. ..	9.02	0.3	−0.8	1.554	−0.3	5.9	8.24	0.6	13.0	1.663	1.8	−8.0	1.613	5.0	1.6
2004 Jan. ...	9.14	1.3	−0.4	1.566	0.7	7.1	8.59	4.3	17.1	1.637	−1.5	−10.1	1.635	1.3	−0.1
Feb. ...	9.18	0.4	0.3	1.573	0.5	7.2	8.78	2.1	16.3	1.626	−0.7	−10.2	1.682	2.9	3.2
March .	9.23	0.6	0.1	1.567	−0.4	6.6	8.54	−2.7	8.9	1.637	0.7	−8.8	1.631	−3.0	2.3
Apr. ...	9.17	−0.8	0.1	1.555	−0.8	3.9	8.30	−2.8	5.9	1.614	−1.4	−9.4	1.607	−1.5	1.4
May ...	9.13	−0.4	−0.3	1.540	−0.9	1.6	8.21	−1.1	4.3	1.703	5.5	−4.7	1.654	2.9	3.3
June ..	9.14	0.2	0.3	1.519	−1.4	−1.4	8.29	1.0	1.5	1.748	2.6	−0.4	1.649	−0.3	4.4
July ...	9.20	0.6	0.1	1.527	0.5	−1.3	8.48	2.3	2.2	1.714	−2.0	−0.3	1.622	−1.6	3.4
Aug. ...	9.19	−0.1	−0.6	1.539	0.8	−0.1	8.33	−1.7	0.9	1.715	0.1	0.2	1.601	−1.3	2.8
Sept. ..	9.09	−1.0	0.3	1.543	0.3	−0.3	8.36	0.3	2.0	1.740	1.5	2.5	1.577	−1.5	2.9
Oct. ..	9.06	−0.3	0.6	1.543	−0.03	−0.4	8.23	−1.5	0.1	1.705	−2.0	1.1	1.560	−1.1	0.7
Nov. ..	9.00	−0.7	0.05	1.522	−1.4	−2.4	8.14	−1.1	−0.7	1.687	−1.1	3.2	1.554	−0.4	1.2
Dec. ..	8.98	−0.2	−0.5	1.536	1.0	−1.2	8.22	1.0	−0.3	1.746	3.5	5.0	1.633	5.1	1.3
2005 Jan. ...	9.05	0.7	−1.0	1.547	0.7	−1.2	8.21	−0.1	−4.4	1.715	−1.8	4.7	1.606	−1.7	−1.8
Feb. ...	9.09	0.4	−1.0	1.550	0.2	−1.5	8.32	1.3	−5.2	1.667	−2.8	2.5	1.613	0.4	−4.1
March .	9.09	0.04	−1.6	1.549	−0.05	−1.1	8.19	−1.6	−4.1	1.681	0.8	2.7	1.606	−0.4	−1.5
Apr. ...	9.17	0.9	0.02	1.547	−0.1	−0.5	8.18	−0.1	−1.5	1.674	−0.4	3.7	1.599	−0.5	−0.5
May ...	9.19	0.3	0.7	1.545	−0.2	0.3	8.08	−1.2	−1.5	1.657	−1.0	−2.7	1.594	−0.3	−3.6
June ..	9.26	0.8	1.3	1.539	−0.4	1.3	7.89	−2.3	−4.7	1.587	−4.2	−9.2	1.511	−5.2	−8.4

* To 31 December 1998, rates for the ECU; from 1 January 1999, rates for the euro. A positive sign indicates an appreciation of the euro, while a negative sign a depreciation. On 1 January 2001, Greece adopted the euro. Therefore, the evolution of the exchange rate of the drachma vis-à-vis the currencies of non-euro area countries is identical with the evolution of the exchange rate of the euro vis-à-vis these currencies. Up to end-2001, however, the differentiation observed in the annual rates of change is attributable to the deviation of the drachma from its central parity in 2000.
Sources: Bank of Greece and European Central Bank (ECB).

T a b l e III.1

Monetary aggregates of the euro area[1,2]

(Outstanding balances in billion euro, not seasonally adjusted)

End of period	Currency in circulation (1)	Overnight deposits (2)	M1 (3)=(1)+(2)	Deposits with an agreed maturity of up to 2 years (4)	Deposits redeemable at notice of up to 3 months (5)	M2 (6)=(3)+(4)+ +(5)	Repurchase agreements (repos) (7)	Money market fund units (8)	Money market paper and debt securities with an initial maturity of up to 2 years (9)	M3[3] (10)=(6)+(7)+ +(8)+(9)
2001	239.7	2,039.2	2,279.0	1,088.8	1,316.6	4,684.4	218.5	398.0	145.9	5,446.8
2002	341.2	2,158.3	2,499.4	1,075.7	1,406.3	4,981.4	226.9	470.5	127.6	5,806.4
2003	397.9	2,329.2	2,727.1	1,039.2	1,529.6	5,295.8	208.7	581.5	92.7	6,178.7
2004	468.4	2,480.4	2,948.8	1,042.1	1,643.0	5,634.0	229.7	604.9	99.2	6,570.8
2003 Jan.	312.1	2,128.7	2,440.8	1,077.2	1,405.5	4,923.8	233.0	534.9	109.2	5,800.5
Feb.	319.3	2,131.9	2,451.2	1,079.6	1,420.7	4,950.8	233.3	547.2	109.0	5,841.1
March . .	327.2	2,170.3	2,497.5	1,072.9	1,435.8	5,003.6	224.0	550.8	99.4	5,880.3
Apr.	336.3	2,190.9	2,527.2	1,082.1	1,443.1	5,052.4	230.5	565.5	122.6	5,970.9
May	343.8	2,217.7	2,561.5	1,097.4	1,450.5	5,109.4	231.7	571.5	103.7	6,016.3
June	351.0	2,254.4	2,605.4	1,060.6	1,464.0	5,130.1	215.0	570.5	99.9	6,015.5
July	361.5	2,223.3	2,584.8	1,064.1	1,475.3	5,124.3	219.9	585.0	94.1	6,023.3
Aug.	362.7	2,210.5	2,573.2	1,070.1	1,482.7	5,126.0	217.1	587.3	92.5	6,022.8
Sept.	364.8	2,250.7	2,615.6	1,038.6	1,482.8	5,136.9	211.5	576.9	87.6	6,013.0
Oct.	371.2	2,249.1	2,620.4	1,049.6	1,487.9	5,157.9	224.7	582.3	104.1	6,069.0
Nov.	379.1	2,288.6	2,667.8	1,043.5	1,494.8	5,206.0	224.7	585.2	103.6	6,119.7
Dec.	397.9	2,329.2	2,727.1	1,039.2	1,529.6	5,295.8	208.7	581.5	92.7	6,178.7
2004 Jan.	389.1	2,313.8	2,702.9	1,021.7	1,547.2	5,271.7	214.6	591.7	95.6	6,173.6
Feb.	393.5	2,309.8	2,703.3	1,016.4	1,553.8	5,273.5	228.6	599.2	97.0	6,198.4
March . .	399.6	2,345.9	2,745.5	1,005.6	1,559.1	5,310.2	219.4	602.6	94.5	6,226.7
Apr.	409.4	2,361.3	2,770.7	1,006.3	1,567.5	5,344.5	225.5	611.0	99.5	6,280.5
May	416.6	2,372.0	2,788.7	1,015.4	1,573.4	5,377.4	221.9	609.0	96.2	6,304.5
June	423.0	2,410.4	2,833.4	989.0	1,585.6	5,408.0	217.7	609.2	100.1	6,335.0
July	436.2	2,398.6	2,834.8	1,000.4	1,593.3	5,428.5	223.0	613.0	97.8	6,362.3
Aug.	433.4	2,362.3	2,795.7	1,003.5	1,598.9	5,398.0	226.0	624.1	99.2	6,347.3
Sept.	438.0	2,419.1	2,857.1	993.1	1,600.9	5,451.1	217.6	609.5	100.4	6,378.4
Oct.	444.4	2,421.6	2,866.0	1,019.4	1,605.0	5,490.4	230.7	617.1	99.0	6,437.1
Nov.	448.7	2,465.0	2,913.7	1,003.7	1,611.5	5,528.9	225.1	613.5	103.1	6,470.5
Dec.	468.4	2,480.4	2,948.8	1,042.1	1,643.0	5,634.0	229.7	604.9	102.3	6,570.8
2005 Jan.	459.9	2,508.1	2,968.0	1,017.0	1,656.1	5,641.0	228.7	616.4	99.2	6,585.4
Feb.	463.6	2,508.0	2,971.6	1,014.6	1,660.4	5,646.6	227.0	615.5	116.1	6,605.2
March . .	471.7	2,526.5	2,998.2	1,018.0	1,665.1	5,681.3	227.7	615.2	107.8	6,631.9
Apr.	481.0	2,551.0	3,032.0	1,034.9	1,672.3	5,739.2	226.9	627.9	120.2	6,714.3
May* . . .	485.8	2,577.5	3,063.3	1,037.1	1,679.5	5,779.9	240.2	634.6	114.5	6,769.2

1 Monetary aggregates comprise monetary liabilities of MFIs and central government (Postal Savings Bank, Ministry of Finance) vis-à-vis non-MFI euro area residents excluding central government.
2 Euro area-11 up to end-2000. Euro area-12 from 1 January 2001 onwards.
3 M3 and its components exclude non-euro area residents' holdings of money market fund units, money market paper and debt securities with an initial maturity of up to 2 years.
* Provisional data.
Source: ECB.

Table III.2

Greek contribution to the main monetary aggregates of the euro area[1]

(Outstanding balances in billion euro, not seasonally adjusted)

End of period	Overnight deposits (1)	Sight deposits and current accounts (1.1)	Savings deposits (1.2)	Deposits with an agreed maturity of up to 2 years (2)	Deposits redeemable at notice of up to 3 months[2] (3)	Repurchase agreements (repos) (4)	Money market fund units (5)	Debt securities of up to 2 years (6)	Total[3] (M3 excluding currency in circulation) (7)=(1)+(2)+(3)+(4)+(5)+(6)
2001	70.8	16.1	54.7	29.4	2.4	24.2	9.7	0.1	136.7
2002	71.7	15.2	56.5	28.9	2.3	20.0	10.7	0.2	133.8
2003	79.5	17.6	61.9	32.3	2.0	10.8	15.7	0.5	140.8
2004	91.7	20.7	71.0	33.4	1.9	9.5	15.2	0.5	152.3
2003 Jan.	70.3	14.2	56.1	28.9	2.2	20.2	12.0	0.2	133.7
Feb.	71.8	14.4	57.4	27.1	2.2	19.2	12.9	0.2	133.5
March ...	72.5	14.9	57.6	27.3	2.2	16.8	14.1	0.2	133.2
Apr.	72.7	14.6	58.1	28.7	2.2	16.3	14.4	0.3	134.7
May	71.9	14.5	57.4	28.8	2.0	15.7	14.7	0.3	133.4
June	74.9	16.7	58.2	29.7	2.1	13.5	15.7	0.4	136.3
July	72.9	15.8	57.1	32.0	2.1	13.0	15.8	0.4	136.3
Aug.	74.0	16.1	57.9	33.0	2.2	12.2	15.7	0.4	137.5
Sept.	74.9	17.1	57.8	32.7	2.1	12.0	15.6	0.4	137.7
Oct.	74.0	16.2	57.8	33.3	2.1	11.8	15.6	0.5	137.3
Nov.	74.1	15.4	58.7	32.9	2.1	11.6	15.5	0.5	136.7
Dec.	79.5	17.6	61.9	32.3	2.0	10.8	15.7	0.5	140.8
2004 Jan.	79.5	17.2	61.6	32.5	2.1	10.6	15.2	0.5	139.7
Feb.	79.6	17.3	62.3	32.1	2.1	10.5	15.2	0.5	139.9
March ...	82.1	17.8	64.3	31.8	2.1	9.5	15.8	0.4	141.6
Apr.	81.4	17.8	63.6	33.5	2.2	9.1	15.9	0.4	142.5
May	82.5	17.0	65.5	32.2	2.1	8.9	15.6	0.4	141.8
June	84.9	18.3	66.6	32.4	2.1	9.4	15.8	0.4	145.0
July	85.5	18.3	67.2	33.0	2.1	9.3	15.9	0.4	146.2
Aug.	84.9	17.7	67.2	33.2	2.1	9.6	15.8	0.4	146.1
Sept.	86.0	18.7	67.3	33.4	2.1	10.5	15.3	0.5	147.8
Oct.	86.4	18.9	67.5	33.6	2.0	10.4	15.4	0.5	148.2
Nov.	87.5	19.6	67.9	33.8	2.0	10.1	15.3	0.5	149.1
Dec.	91.7	20.7	71.0	33.4	1.9	9.5	15.2	0.5	152.3
2005 Jan.	90.4	19.8	70.6	37.8	2.0	5.6	14.9	0.5	151.2
Feb.	91.9	20.8	71.1	39.4	2.0	4.4	14.6	0.5	152.8
March ...	90.9	20.4	70.6	41.0	2.0	4.2	14.2	0.4	152.6
Apr.	91.1	20.2	70.9	42.3	2.6	3.8	13.0	0.5	153.4
May	91.5	20.2	71.2	42.6	2.8	4.1	12.5	0.5	153.9

1 The Greek contribution begins upon Greece's entry into the euro area (1 January 2001). For statistical reasons, however, the data on monetary aggregates were extended to cover previous years as well.

2 Including savings deposits in currencies other than the euro.

3 The Greek M3 (and likewise any euro area national M3) can no longer be accurately calculated, since part of the quantity of euro banknotes and coins that have been put into circulation in a euro area country is held by residents of other euro area countries and/or by non-residents. Due to these technical problems, the compilation of the Greek M0, M1, M2 and M3 was interrupted in January 2003.

Source: Bank of Greece.

T a b l e   III.3

Greece: deposits of domestic firms and households with OMFIs,[1] by currency and type

(Outstanding balances in million euro, not seasonally adjusted)

| End of period | Total deposits | By currency | | By type | | |
		Deposits in euro[2]	Deposits in other currencies	Sight deposits	Savings deposits	Time deposits[3]
2001	101,809.5	79,566.0	22,243.5	13,385.2	58,323.1	30,101.1
2002	104,761.1	87,732.3	17,028.8	13,367.3	60,406.1	30,987.7
2003	115,750.1	98,119.3	17,630.8	15,395.8	65,141.1	35,213.2
2004	128,424.6	110,206.7	18,217.9	18,274.2	73,954.2	36,196.1
2003 Jan.	102,687.7	85,423.3	17,264.4	11,703.0	59,707.7	31,277.0
Feb.	102,455.9	85,527.5	16,928.4	12,419.8	60,981.4	29,054.7
March	103,684.4	86,637.5	17,046.9	12,996.7	61,203.6	29,484.0
Apr.	105,407.4	87,642.8	17,764.6	12,664.5	61,690.6	31,052.2
May	104,593.8	86,997.3	17,596.5	12,586.4	60,809.6	31,197.8
June	108,637.5	90,199.0	18,438.5	14,702.7	61,700.5	32,234.3
July	108,694.9	89,934.1	18,760.8	13,670.6	60,471.2	34,553.1
Aug.	110,793.2	91,498.3	19,294.9	14,035.9	61,242.3	35,515.0
Sept.	111,384.5	92,881.7	18,502.8	14,958.4	61,151.5	35,274.5
Oct.	111,068.9	92,207.8	18,861.1	14,024.4	61,020.5	36,024.0
Nov.	110,668.9	92,383.7	18,285.2	13,157.4	61,846.9	35,664.6
Dec.	115,750.1	98,119.3	17,630.8	15,395.8	65,141.1	35,213.2
2004 Jan.	114,996.0	96,977.6	18,018.4	14,874.7	64,645.4	35,476.0
Feb.	115,491.9	97,036.0	18,455.9	15,089.7	66,332.2	34,070.0
March	117,571.4	98,647.3	18,924.1	15,479.0	67,322.0	34,770.4
Apr.	118,835.4	99,526.4	19,309.0	15,687.6	66,697.8	36,450.0
May	118,645.4	99,905.7	18,739.7	14,995.6	68,548.9	35,100.9
June	120,997.2	102,774.4	18,222.8	16,078.1	69,641.4	35,277.7
July	122,396.3	103,778.5	18,617.8	16,368.9	70,186.6	35,840.9
Aug.	122,065.6	103,347.9	18,717.7	15,579.5	70,397.0	36,089.1
Sept.	123,471.3	104,687.8	18,783.6	16,727.8	70,396.8	36,346.7
Oct.	123,971.8	105,394.3	18,577.5	16,840.4	70,593.6	36,537.8
Nov.	124,875.8	106,408.6	18,467.2	17,304.0	70,903.5	36,668.3
Dec.	128,424.6	110,206.7	18,217.9	18,274.2	73,954.2	36,196.1
2005 Jan.	131,749.7	114,232.0	17,517.7	17,586.6	73,515.5	40,647.6
Feb.	134,088.9	116,771.1	17,317.8	17,866.2	74,096.0	42,126.7
March	134,801.8	116,303.2	18,498.7	17,521.9	73,527.1	43,752.9
Apr.	136,854.8	118,087.9	18,766.9	17,333.7	74,453.1	45,068.0
May	137,472.8	118,223.8	19,248.5	17,189.9	75,046.6	45,235.8

1 Other Monetary Financial Institutions (OMFIs) comprise credit institutions (other than the Bank of Greece) and money market funds.
2 Including (until 31 December 2001) deposits in drachmas and the other euro legacy currencies.
3 Including blocked deposits.
Source: Bank of Greece.

T a b l e III.4

Domestic MFI loans to domestic enterprises and households, by branch of economic activity

(Balances in million euro)

| End of period | Total | In euro | In foreign currency | Branches of economic activity | | | | | | |
				Agricul-ture	Industry[1]	Trade	Housing	Tourism	Consumer credit	Other
2001	74,027.4	66,722.6	7,304.8	3,724.2	12,614.9	15,524.3	15,652.2	2,171.3	7,852.0	16,488.5
2002	86,510.5	80,099.7	6,410.8	3,224.7	14,364.0	15,670.8	21,224.7	2,903.2	9,755.4	19,367.7
2003	101,178.1	95,649.4	5,528.7	3,082.7	15,865.1	16,514.4	26,534.2	3,488.2	12,409.6	23,283.9
2004	117,201.7	111,951.1	5,250.6	3,248.0	15,675.6	18,821.6	33,126.8	4,040.0	17,053.8	25,235.9
2003 Jan.	88,241.8	81,751.6	6,490.2	2,964.2	14,529.2	16,321.5	21,599.4	2,978.4	9,884.9	19,964.2
Feb.. . . .	88,787.7	82,332.2	6,455.5	2,980.5	14,485.6	16,310.3	22,062.6	3,049.0	10,023.3	19,876.4
March . .	89,363.0	83,075.2	6,287.8	2,994.0	14,422.3	16,053.5	22,366.8	3,095.5	10,247.3	20,183.6
Apr.. . . .	90,770.3	84,710.6	6,059.7	3,043.0	14,565.0	16,113.4	22,747.1	3,149.2	10,344.7	20,807.9
May . . .	92,497.1	86,811.4	5,685.7	3,027.6	14,866.7	16,488.6	23,183.1	3,085.8	10,432.6	21,412.7
June . . .	94,344.1	88,447.4	5,896.7	3,062.3	15,165.2	16,139.3	23,705.7	3,201.0	10,600.9	22,469.7
July	96,253.7	90,203.0	6,050.7	3,062.9	15,674.1	16,307.5	24,267.2	3,207.5	10,871.8	22,862.7
Aug. . . .	97,350.8	91,177.5	6,173.3	3,102.1	15,681.4	16,700.8	24,573.2	3,255.1	11,075.2	22,963.0
Sept . . .	97,747.2	91,865.5	5,881.7	3,103.0	15,544.4	16,612.9	25,043.9	3,278.1	11,301.1	22,863.8
Oct	98,403.4	92,480.6	5,922.8	3,117.3	15,481.2	16,393.0	25,559.5	3,321.0	11,670.4	22,861.0
Nov. . . .	99,829.3	94,044.9	5,784.4	3,093.6	15,780.9	16,633.3	25,808.6	3,392.4	12,063.2	23,057.3
Dec. . . .	101,178.1	95,649.4	5,528.7	3,082.7	15,865.1	16,514.4	26,534.2	3,488.2	12,409.6	23,283.9
2004 Jan.	102,748.9	96,982.9	5,766.0	3,055.4	16,005.1	16,822.7	26,902.8	3,536.8	12,690.8	23,735.3
Feb.. . . .	103,899.7	98,214.0	5,685.7	3,042.0	15,948.2	17,060.8	27,334.5	3,587.7	13,041.9	23,884.6
March . .	105,263.2	99,372.4	5,890.8	3,095.5	15,831.8	17,012.4	27,894.2	3,661.6	13,442.3	24,325.4
Apr.. . . .	106,447.1	100,530.0	5,917.1	3,150.5	15,734.1	17,134.7	28,465.8	3,703.2	13,798.6	24,460.2
May . . .	108,835.0	103,158.1	5,676.9	3,242.6	15,950.4	17,773.5	29,080.6	3,766.9	14,169.3	24,851.7
June . . .	109,806.8	104,096.1	5,710.7	3,324.8	15,831.1	17,952.6	29,035.7	3,801.5	14,585.6	25,275.5
July	111,624.2	105,976.3	5,647.9	3,348.0	15,997.2	18,214.6	29,822.1	3,862.7	14,985.2	25,394.4
Aug. . . .	111,905.0	106,222.2	5,682.8	3,376.4	15,740.2	18,062.7	30,244.2	3,841.8	15,327.8	25,311.9
Sept . . .	113,392.1	107,821.5	5,570.6	3,402.8	15,743.6	18,335.8	30,832.5	3,865.3	15,722.9	25,489.2
Oct	114,868.1	109,490.1	5,378.0	3,397.8	15,988.2	18,687.8	31,404.7	3,987.5	16,114.1	25,288.0
Nov. . . .	115,636.5	110,275.4	5,361.1	3,303.2	15,755.2	18,612.8	32,138.9	3,930.4	16,580.3	25,315.7
Dec. . . .	117,201.7	111,951.1	5,250.6	3,248.0	15,675.6	18,821.6	33,126.8	4,040.0	17,053.8	25,235.9
2005 Jan.	118,387.3	112,849.1	5,538.2	3,237.8	15,645.2	18,921.1	33,672.4	4,079.3	17,275.8	25,555.7
Feb.. . . .	118,906.4	113,426.3	5,480.1	3,161.6	15,623.8	19,104.7	34,281.6	4,129.9	17,610.7	24,994.1
March . .	120,704.9	114,825.5	5,879.4	3,079.3	15,565.9	19,309.8	35,091.5	4,180.8	17,995.6	25,482.0
Apr.. . . .	123,037.2	117,015.9	6,021.3	3,059.3	15,926.1	19,565.9	35,878.7	4,211.2	18,550.0	25,846.0
May . . .	124,228.8	118,054.2	6,174.6	3,038.1	15,872.9	19,520.5	36,610.2	4,225.7	18,896.4	26,065.0

1 Comprising manufacturing and mining.
Source: Bank of Greece.

T a b l e III.5

ECB and Bank of Greece interest rates

(Percentages per annum)

1. ECB interest rates				2. Bank of Greece interest rates					
With effect from[1]	Deposit facility	Main refinancing operations[3]	Marginal lending facility	With effect from	Overnight deposit facility, first tier[4]	Overnight deposit facility, second tier[4]	14-day intervention rate	Lombard rate
1999 1 Jan.	2.00	3.00	4.50	**1999** 14 Jan.	11.50	9.75	12.00	13.50
4 Jan.[2]	2.75	3.00	3.25	21 Oct.	11.00	9.75	11.50	13.00
22 Jan.	2.00	3.00	4.50	16 Dec.	10.25	9.25	10.75	12.25
9 Apr.	1.50	2.50	3.50	27 Dec.	10.25	9.00	10.75	11.50
5 Nov.	2.00	3.00	4.00					
2000 4 Feb.	2.25	3.25	4.25	**2000** 27 Jan.	9.50	8.50	9.75	11.00
17 March	2.50	3.50	4.50	9 March	8.75	8.00	9.25	10.25
28 Apr.	2.75	3.75	4.75	20 Apr.	8.00	7.50	8.75	9.50
9 June	3.25	4.25	5.25	29 June	7.25	–	8.25	9.00
28 June[3]	3.25	4.25	5.25	6 Sept.	6.50	–	7.50	8.25
1 Sept.	3.50	4.50	5.50	15 Nov.	6.00	–	7.00	7.75
6 Oct.	3.75	4.75	5.75	29 Nov.	5.50	–	6.50	7.25
				13 Dec.	4.75	–	5.75	6.50
				27 Dec.	3.75	–	4.75	5.75
2001 11 May	3.50	4.50	5.50					
31 Aug.	3.25	4.25	5.25					
18 Sept.	2.75	3.75	4.75					
9 Nov.	2.25	3.25	4.25					
2002 6 Dec.	1.75	2.75	3.75					
2003 7 March	1.50	2.50	3.50					
6 June	1.00	2.00	3.00					

1 The date refers to the deposit and marginal lending facilities. For main refinancing operations, unless otherwise indicated, changes in the rate are effective from the first operation following the date indicated. The change on 18 September 2001 was effective on that same day.

2 On 22 December 1998 the ECB announced that, as an exception measure between 4 and 21 January 1999, a narrow corridor of 50 basic points would be applied between the interest rate for the marginal lending facility and that for the deposit facility, aimed at facilitating the transition of market participants to the new regime.

3 Until 21 June 2000: fixed-rate tenders, from 28 June 2000: minimum bid rate in variable rate tenders.

4 On 29 June 2000 the second tier of the deposit facility was abolished; the interest rate thereafter applies to the unified deposit acceptance account.

Sources: ECB and Bank of Greece.

T a b l e III.6

Greek government paper yields

(Percentages per annum, period averages)

Period	Yield on one-year Treasury bills	Yield on government bonds					
		3-year	5-year	7-year	10-year	15-year	20-year
2001	4.08	4.28	4.58	4.82	5.30	5.51	5.76
2002	3.50	4.06	4.45	4.78	5.12	5.24	5.52
2003	2.34	2.82	3.37	3.83	4.27	4.32	4.91
2004	2.27	2.87	3.37	3.81	4.25	4.53	4.77
2003 Jan.	2.70	2.91	3.36	3.81	4.43	4.51	4.97
Feb.	2.50	2.65	3.31	3.89	4.24	4.27	4.83
March	2.41	2.82	3.38	3.83	4.26	4.33	4.90
Apr.	2.46	2.99	3.50	3.96	4.38	4.45	5.02
May	2.25	2.64	3.12	3.57	4.02	4.09	4.73
June	2.02	2.38	2.88	3.33	3.81	3.86	4.57
July	2.08	2.62	3.18	3.65	4.12	4.16	4.83
Aug.	2.28	2.98	3.51	3.91	4.29	4.34	4.90
Sept.	2.26	2.91	3.47	3.91	4.32	4.37	4.96
Oct.	2.30	2.94	3.52	3.95	4.38	4.43	5.02
Nov.	2.41	3.06	3.67	4.09	4.51	4.55	5.10
Dec.	2.38	2.97	3.58	4.02	4.45	4.49	5.04
2004 Jan.	2.21	2.71	3.34	3.81	4.37	4.33	4.94
Feb.	2.17	2.91	3.28	3.90	4.35	4.28	4.91
March	2.06	2.71	3.26	3.71	4.17	4.43	4.75
Apr.	2.16	2.90	3.45	3.90	4.35	4.72	4.88
May	2.30	3.08	3.63	4.07	4.49	4.86	5.01
June	2.41	3.19	3.73	4.15	4.55	4.89	5.03
July	2.36	3.07	3.61	4.03	4.44	4.79	4.93
Aug.	2.30	2.91	3.43	3.85	4.28	4.63	4.78
Sept.	2.37	2.91	3.40	3.79	4.22	4.56	4.70
Oct.	2.32	2.76	3.25	3.65	4.11	4.47	4.61
Nov.	2.33	2.66	3.12	3.53	3.97	4.33	4.47
Dec.	2.30	2.59	2.98	3.36	3.77	4.10	4.24
2005 Jan.	2.31	2.72	2.96	3.29	3.69	3.99	4.12
Feb.	2.31	2.80	2.97	3.34	3.69	3.94	4.04
March	2.34	2.88	3.06	3.56	3.92	4.12	4.24
Apr.	2.27	2.70	3.06	3.37	3.76	3.98	4.11
May	2.19	2.55	2.89	3.21	3.60	3.82	3.95
June	2.10	2.35	2.70	3.02	3.44	3.66	3.79

Source: Bank of Greece.

T a b l e   III.7

Greece: bank rates on new euro-denominated deposits of, and loans to, euro area residents

(Percentages per annum, period averages, unless otherwise indicated)

Period	Deposits by households			Deposits by non-financial corporations		Repurchase agreements (repos)
	Overnight[1,2]	Savings[2]	With an agreed maturity of up to 1 year	Overnight[2]	With an agreed maturity of up to 1 year	
2003	0.93	0.92	2.48	0.63	2.49	2.24
2004	0.91	0.90	2.29	0.55	2.17	1.98
2003 Jan.	1.10	1.09	2.83	0.74	2.88	2.75
Feb.	1.10	1.10	2.73	0.75	2.79	2.71
March	1.06	1.05	2.68	0.69	2.40	2.54
Apr.	1.05	1.04	2.70	0.73	2.67	2.46
May	1.04	1.03	2.61	0.70	2.66	2.45
June	0.82	0.81	2.44	0.55	2.41	2.10
July	0.80	0.79	2.38	0.60	2.36	2.04
Aug.	0.81	0.79	2.29	0.52	2.31	2.00
Sept.	0.81	0.80	2.30	0.55	2.30	1.98
Oct.	0.87	0.85	2.27	0.62	2.37	1.98
Nov.	0.87	0.85	2.29	0.54	2.33	1.94
Dec.	0.87	0.86	2.22	0.59	2.35	1.98
2004 Jan.	0.88	0.86	2.26	0.55	2.18	1.99
Feb.	0.88	0.87	2.18	0.57	2.17	1.98
March	0.89	0.87	2.29	0.54	2.13	1.95
Apr.	0.89	0.88	2.26	0.56	2.13	1.97
May	0.90	0.89	2.24	0.56	2.23	1.95
June	0.91	0.90	2.29	0.54	2.16	1.97
July	0.91	0.91	2.32	0.56	2.18	1.97
Aug.	0.92	0.91	2.31	0.60	2.19	1.96
Sept.	0.93	0.92	2.33	0.53	2.12	1.97
Oct.	0.94	0.93	2.35	0.53	2.17	1.98
Nov.	0.95	0.94	2.36	0.51	2.18	2.00
Dec.	0.96	0.94	2.30	0.55	2.20	2.01
2005 Jan.	0.96	0.95	2.25	0.56	2.08	1.97
Feb.	0.95	0.94	2.19	0.55	2.07	1.97
March	0.93	0.91	2.22	0.55	2.02	1.97
Apr.	0.89	0.86	2.22	0.55	2.07	1.98
May	0.89	0.87	2.19	0.56	2.04	1.99

1 Weighted average of the current account rate and the savings deposit rate.
2 End-of-month rate.
Source: Bank of Greece.

Greece: bank rates on new euro-denominated deposits of, and loans to, euro area residents

(Percentages per annum)

| Period | Loans to households[1] | | | | | Loans to non-financial corporations[1] | | |
| | | Consumer loans | | Housing loans | | | With a floating rate or an initial rate fixation of up to 1 year | |
	Loans without defined maturity [2,3]	With a floating rate or an initial rate fixation of up to 1 year	Average rate on total consumer loans	With a floating rate or an initial rate fixation of up to 1 year	Average rate on total housing loans	Loans without defined maturity [3,4]	Up to €1 million	Over €1 million
2003	14.41	10.57	10.47	4.51	4.78	6.86	5.29	3.98
2004	13.81	9.55	9.86	4.30	4.51	7.01	4.98	3.67
2003 Jan.	14.71	10.46	10.17	4.53	4.77	7.15	5.53	4.39
Feb.	14.68	11.13	10.60	4.58	4.81	7.09	5.59	4.27
March	14.66	10.82	10.76	4.58	4.87	7.04	5.37	4.06
Apr.	14.76	11.15	10.82	4.58	4.93	7.07	5.55	4.14
May	14.58	11.13	10.70	4.59	4.93	6.95	5.68	3.76
June	14.54	10.61	10.44	4.53	4.86	6.84	5.15	3.47
July	14.24	10.41	10.33	4.37	4.66	6.70	5.06	3.68
Aug.	14.05	10.24	10.37	4.48	4.76	6.67	4.95	3.60
Sept.	14.14	10.37	10.60	4.62	4.81	6.67	5.14	4.27
Oct.	14.22	10.57	10.58	4.57	4.81	6.68	5.24	4.68
Nov.	14.27	10.36	10.46	4.35	4.63	6.72	5.14	3.66
Dec.	14.08	9.60	9.86	4.31	4.53	6.78	5.13	3.78
2004 Jan.	13.92	9.82	9.94	4.36	4.68	6.74	5.12	3.92
Feb.	13.97	9.94	9.99	4.35	4.63	6.85	5.16	4.09
March	14.00	9.44	9.87	4.37	4.63	7.13	4.88	3.45
Apr.	14.06	9.56	9.85	4.36	4.55	7.11	5.15	3.49
May	13.79	9.82	10.07	4.33	4.54	7.02	4.91	3.45
June	13.89	9.71	10.05	4.30	4.54	7.06	4.89	3.58
July	13.84	9.60	9.67	4.24	4.43	7.03	4.84	3.53
Aug.	13.77	9.70	10.05	4.34	4.53	7.06	4.95	3.52
Sept.	13.62	9.37	9.91	4.23	4.43	7.05	4.87	3.80
Oct.	13.72	9.68	9.87	4.29	4.45	7.02	4.86	3.83
Nov.	13.75	9.40	9.72	4.23	4.36	7.05	5.06	3.61
Dec.	13.41	8.58	9.36	4.21	4.37	6.97	5.04	3.77
2005 Jan.	13.42	8.85	9.39	4.23	4.39	6.95	4.89	3.54
Feb.	13.72	8.99	9.62	4.20	4.34	6.95	5.08	3.53
March	13.51	8.53	9.43	4.15	4.27	6.94	5.00	3.70
Apr.	13.74	8.58	9.37	4.13	4.23	6.94	5.09	3.58
May	13.63	8.88	9.13	4.12	4.21	6.89	4.96	3.47

1 Charges are not included.
2 Weighted average of interest rates on loans to households through credit cards, open loans and current account overdrafts.
3 End-of-month rate.
4 Weighted average of interest rates on corporate loans through credit lines and sight deposit overdrafts.
Source: Bank of Greece.

T a b l e IV.1

Net borrowing requirement of central government on a cash basis[1,2,3]

(Million euro)

	Years		January - June		
	2003	2004	2003	2004	2005*
Central government	**10,526**	**15,605**	**6,331**	**10,142**	**11,613**
– State budget	10,833	15,377	7,559	11,195	13,064
(Ordinary budget)[4]	4,106	8,841	4,962	8,474	12,306[6]
(Public investment budget)	6,727	6,536	2,597	2,721	758
– OPEKEPE[5]	–307	228	–1,228	–1,053	–1,451
Percentage of GDP	**6.9**	**9.4**	**4.1**	**6.1**	**6.5**

1 This table will henceforth show the borrowing requirement of central government on a cash basis. The borrowing requirement of public organisations will henceforth be calculated by the NSSG on the basis of detailed data collected directly from these entities, in the framework of a special quarterly survey concerning their financial results (revenue-expenditure) and their financial situation (loans, investment in securities, deposits etc.).

2 As shown by the movement of relevant accounts with the Bank of Greece and credit institutions.

3 Excluding the repayment of debts of the Greek government to the Social Insurance Institute (IKA) through bond issuance (Law 2972/2001, Article 51). These debts amounted to €3,927.9 million and were repaid in three instalments (2002: €1,467.4 million, 2003: €1,549.5 million and 2004: €911 million).

4 Including the movement of public debt management accounts.

5 Payment and Control Agency for Guidance and Guarantee Community Aid. It replaced DICAGEP (Agricultural Markets Management Service) as of 3 September 2001.

6 Including the subsidisation of hospitals with about €1,580 million and expenditure for the capital increase (by €1,028.5 million) of the Agricultural Bank of Greece.

* Provisional data and estimates.

Source: Bank of Greece.

T a b l e IV.2

Financing of borrowing requirement of central government

(Million euro)

	Years				January - June					
	2003		2004		2003		2004		2005*	
	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total
Treasury bills and government bonds[1,2]	13,378	127.1	16,829	107.8	12,236	193.3	15,358	151.4	13,329	114.8
Change in balances of central government accounts with the credit system[3]	–871	–8.3	–901	–5.8	–4,015	–63.4	–5,705	–56.3	–1,931	–16.6
External borrowing[4]	–1,981	–18.8	–323	–2.1	–1,890	–29.9	489	4.8	215	1.9
Total	**10,526**	**100.0**	**15,605**	**100.0**	**6,331**	**100.0**	**10,142**	**100.0**	**11,613**	**100.0**

1 Comprising domestically issued Treasury bills and government bonds as well as privatisation certificates.

2 Excluding government bond issuance for the repayment of debts to IKA (Law 2972/2001, Article 51). Also see footnote 3 in Table IV.1.

3 Including changes in central government accounts with the Bank of Greece and other credit institutions, as well as the change in the OPEKEPE account.

4 Comprising government borrowing abroad and securities issuance abroad, as well as the change in government deposits with foreign banks. Excluding non-residents' holdings of domestically issued government bonds.

* Provisional data.

Source: Bank of Greece.

T a b l e IV.3
State Budger results
(Million euro)

	Years			Percentage change		January-May			Percentage change	
	2003	2004*	Budget for 2005	2004*/03	Budget for 2005/04*	2003	2004	2005*	2004/03	2005*/04
I. REVENUE[1]	41,704	45,117	49,710	8.2	10.2	16,014	17,678	18,400	10.4	4.1
1. Ordinary budget	39,881	42,035	46,310	5.4	10.2	15,401	16,584	17,252	7.7	4.0
2. Public investment budget	1,823	3,082	3,400	69.1	10.3	613	1,094	1,148	78.5	4.9
(Own revenue)	77	88	100	14.3	13.6	...	...	...	–	–
(Revenue from the EU)	1,746	2,994	3,300	71.5	10.2	...	...	...	–	–
II. EXPENDITURE[1]	51,551	57,785	58,227	12.1	0.8	22,076	24,295	24,568	10.1	1.1
1.1 Ordinary budget	43,116	48,270	50,177	12.0	4.0	19,359	21,372	22,788	10.4	6.6
(Interest payments and other expenditure)[2]	9,416	9,466	9,800	0.5	3.5	5,779	5,846	6,636	1.2	13.5
1.2 Ordinary budget primary expenditure	33,700	38,804	40,377	15.1	4.1	13,580	15,526	16,152	14.3	4.0
2. Public investment budget	8,435	9,515	8,050	12.8	–15.4	2,717	2,923	1,780	7.6	–39.1
III. STATE BUDGET RESULTS	–9,847	–12,668[3]	–8,517			–6,062	–6,617	–6,168		
Percentage of GDP	–6.4	–7.7	–4.8			–3.9	–4.0	–3.5		
1. Ordinary budget	–3,235	–6,235	–3,867			–3,958	–4,788	–5,536		
2. Public investment budget	–6,612	–6,433	–4,650			–2,104	–1,829	–632		
IV. PRIMARY SURPLUS	–431	–3,202	1,283			–283	–771	468		
AMORTISATION PAYMENTS[2,3]	21,615	20,356	21,786	–5.8	7.0	13,044	11,771	10,615	–9.8	–9.8
MINISTRY OF NATIONAL DEFENCE PROGRAMMES FOR THE PROCUREMENT OF MILITARY EQUIPMENT[2]	987	825	1,600	–16.4	93.9	160	334	272	108.8	–18.6

1 For comparability purposes, tax refunds are included in expenditure and have not been deducted from revenue.
2 From 2003 onwards, such payments are recorded in the off-budget item "Ministry of National Defence Programmes for the procurement of military equipment".
3 Including a grant of €220 million to OTE's personnel insurance fund (TAP-OTE).
* Provisional data.
Source: General Accounting Office.

Articles published in previous issues of the *Economic Bulletin*

Boutos Yannis, "Economic stabilisation and growth prospects", No. 3, February 1994.

Papademos Lucas, "Growth with stability: the role of monetary policy", No. 5, March 1995.

Voridis Hercules, "The special nature of banks and the transmission mechanism of monetary policy: A review of recent literature", No. 5, March 1995.

Filippides Anastasios, Kyriakopoulos Panayotis and Moschos Dimitrios, "Bank of Greece monetary policy instruments", No. 6, November 1995.

Haralabides Michael, Hardouvelis Gikas and Papageorgiou George, "Changeover to the single currency: Prospects and challenges for credit institutions in Greece", No. 6, November 1995.

Karabalis Nikos, "Harmonisation of Consumer Price Indices in EU countries", No. 7, March 1996.

Public Sector Accounts Department, Studies, Planning and Operations Development Office, "Government Securities Markets", No. 7, March 1996.

Saccomanni Fabrizio,"Opportunities and challenges in the process of European monetary integration", No. 7, March 1996.

Papademos Lucas, "Challenges facing monetary policy on the road to EMU", No. 8, November 1996.

Information Systems and Organisation Department, "Developments in EU Payment Systems: TARGET and the Hellenic system Hermes", No. 8, November 1996.

Brissimis Sophocles and Gibson Heather, "Monetary policy, capital flows and Greek disinflation", No. 9, March 1997.

Sabethai Isaac, "From contractual earnings to labour costs: incomes policy, collective bargaining and inflation (1991-1996)", No. 9, March 1997.

Hall S. G. and Zonzilos Nicholas, "The output gap and inflation in Greece", No. 9, March 1997.

Pantelidis Evangelos, "The methodology of the new balance of payments compilation system of the Bank of Greece", No. 9, March 1997.

Papademos Lucas, "The globalisation of financial markets and the conduct of economic and monetary policy", No. 10, December 1997.

Brissimis Sophocles and Kastrisianakis Efstratios, "Is there a credit channel in the Greek economy?", No. 10, December 1997.

Gibson Heather, "The relationship between the financial system and the real economy", No. 10, December 1997.

Hondroyiannis George and Papapetrou Evangelia, "The causal relationship between consumer and wholesale prices in Greece", No. 10, December 1997.

Hardy Daniel and Simigiannis George, "Competition and efficiency of the Greek banking system", No. 11, June 1998.

Brissimis Sophocles and Gibson Heather, "What can the yield curve tell us about inflation?", No. 11, June 1998.

Pantazidis Stelios, "Inflation, investment and economic growth in Greece", No. 11, June 1998.

Mitrakos Theodoros, "The contribution of income sources to overall inequality", No. 11, June 1998.

Garganas C. Nicholas, "Greece and EMU: prospects and challenges", No. 12, December 1998.

Brissimis Sophocles, Sideris Dimitris and Voumvaki Fragiska, "Purchasing power parity as a long-run relationship: an empirical investigation of the Greek case", No. 12, December 1998.

Manassaki Anna, "European Union transfers to Greece: historical background and prospects", No. 12, December 1998.

Lazaretou Sophia, "The drachma on the metallic monetary standards: lessons from the past", No. 13, July 1999.

Hondroyiannis George, "The causality between government spending and government revenue in Greece", No. 13, July 1999.

Mitrakos Theodoros and Tsakloglou Panos, "The distributional impact of excise duties", No. 13, July 1999.

Dellas Harris, "ECB monetary policy strategy and macroeconomic volatility in Greece", No. 13, July 1999.

Papazoglou Christos, "The real exchange rate and economic activity: is the hard-drachma policy necessarily contractionary?", No. 14, December 1999.

Gibson Heather and Lazaretou Sophia, "Leading inflation indicators for Greece: an evaluation of their predictive power", No. 14, December 1999.

Karapappas Andreas and Milionis Alexandros, "Estimation and analysis of external debt in the private sector", No. 14, December 1999.

Papademos Lucas, "From the drachma to the euro", No. 15, July 2000.

Zonzilos Nicholas, "The Greek Phillips curve and alternative measures of the NAIRU", No. 15, July 2000.

Pantazidis Stelios, "The sustainability of the current account deficit", No. 15, July 2000.

Hondroyiannis George, "Investigating causality between prices and wages in Greece", No. 15, July 2000.

Sabethai Isaac, "The Greek labour market: features, problems and policies (with emphasis on labour market flexibility and on combatting unemployment in the context of non-inflationary growth)", No. 16, December 2000.

Brissimi Dimitra and Brissimis Sophocles, "The problem of unemployment in the European Union", No. 16, December 2000.

Bardakas Joanna, "Financial deregulation, liquidity constraints and private consumption in Greece", No. 16, December 2000.

Lazaretou Sophia and Brissimis Sophocles, "Fiscal rules and stabilisation policy in the euro area", No. 17, July 2001.

Lolos Sarantis-Evangelos, "The role of European structural resources in the development of the Greek economy", No. 17, July 2001.

Papazoglou Christos, "Regional economic integration and inflows of foreign direct investment: the European experience", No. 17, July 2001.

Garganas C. Nicholas, "The future of Europe and EMU", No. 18, December 2001.

Brissimis Sophocles and Papadopoulou Dafni-Marina, "The physical introduction of euro banknotes and coins in Greece", No. 18, December 2001.

Zonzilos Nicholas, "The monetary transmission mechanism – the ECB experiment: results for Greece", No. 18, December 2001.

Brissimis Sophocles, Kamberoglou Nicos and Simigiannis George, "Bank-specific characteristics and their relevance to monetary policy transmission", No. 18, December 2001.

Tsaveas Nicholas, "Exchange rate regimes and exchange rate policy in South Eastern Europe", No. 18, December 2001.

Demenagas Nicholas and Gibson Heather, "Competition in Greek banking: an empirical study for the period 1993-1999", No. 19, July 2002.

Hondroyiannis George, "Economic and demographic determinants of private savings in Greece", No. 19, July 2002.

Gatzonas Efthymios and Nonika Kalliopi, "Eligible assets and management of collateral in the context of central bank monetary policy operations", No. 19, July 2002.

Voridis Hercules, Angelopoulou Eleni and Skotida Ifigeneia, "Monetary policy in Greece 1990-2000 through the publications of the Bank of Greece", No. 20, January 2003.

Kaplanoglou Georgia and Newbery David, "The distributional impact of indirect taxation in Greece", No. 21, July 2003.

Papapetrou Evangelia, "Wage differentials between the public and the private sector in Greece", No. 21, July 2003.

Athanasoglou Panayiotis and Brissimis Sophocles, "The effect of mergers and acquisitions on bank efficiency in Greece", No. 22, January 2004.

Lazaretou Sophia, "Monetary system and macroeconomic policy in Greece: 1833-2003", No. 22, January 2004.

Karabalis Nikos and Kondelis Euripides, "Alternative measures of inflation", No. 22, January 2004.

Papaspyrou Theodoros, "EMU strategies for new Member States: the role of Exchange Rate Mechanism II", No. 23, July 2004.

Mitrakos Theodore, "Education and economic inequalities", No. 23, July 2004.

Papapetrou Evangelia, "Gender wage differentials in Greece", No. 23, July 2004.

Gibson Heather, "Greek banking profitability: recent developments", No. 24, January 2005.

Athanasoglou Panagiotis, Asimakopoulos Ioannis and Georgiou Evangelia, "The effect of merger and acquisition announcement on Greek bank stock returns", No. 24, January 2005.

Mitrakos Theodore and Zografakis Stavros, "The redistributional impact of inflation in Greece", No. 24, January 2005.

Theodossiou Ioannis and Pouliakas Konstantinos, "Socio-economic differences in the job satisfaction of high-paid and low-paid workers in Greece", No. 24, January 2005.