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The effect of M&A on bank efficiency in Greece

Panayiotis Athanasoglou and Sophocles Brissimis

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Panayiotis P. Athanasoglou

Bank of Greece
Economic Research Department

Sophocles N. Brissimis

Bank of Greece
Economic Research Department
Professor, University of Piraeus

1. Introduction

During the 1990s, there was an impressive level of activity in mergers and acquisitions (M&As)[1] in the banking sector internationally. This activity was particularly intense in the period 1995-1999, when approximately two M&As took place each day.[2] M&As during this five-year period mainly involved large banks, whereas interest had focused on small banks during the previous five years. The deregulation and integration of financial markets, improved supervision of banking systems, technological advances and the development of new IT systems all played a part in increasing the number of M&As in this sector. These factors led to greater competition among banks, which as a result tried to improve their efficiency, to expand the scale of their operations and to widen the range of services provided.

M&As are one of the ways of developing these strategies, though they do not automatically lead to improved bank performance. M&As can lead to enhanced efficiency in bank operations as staff is reduced, other costs are controlled, portfolios are

diversified, income is increased, etc. In addition, M&As allow banks to become considerably larger and increase their expertise concerning new products and markets. This makes it possible for them to take advantage of economies of scale and scope (synergies).

In the EU, the strategy which banks are pursuing in principle involves strengthening their position in the domestic market (see Athanasoglou, 1998[3]), so as to be in a better position to face competition from other European banks as well as from the US and Japan. However, the permanent loss of certain income, especially that due to the adoption of the euro, coupled with a severe reduction in other income, was not accompanied by any corresponding cut in expenses. As a result, efficiency fell to a lower level and made M&As inevitable in many cases.[4] Nonetheless, M&As were less widespread in the EU than in the US and Japan. This was due to the substantial growth in the EU of banks which provide a wide range of financial services and as a result are relatively large in size.

In Greece, the deregulation of the banking system in the mid-1980s and the resulting high levels of bank profitability led to the establishment of a number of small private banks.[5] At the same time, state-controlled banks made efforts to modernise and improve their efficiency. However, M&A activity within the Greek banking market began somewhat late and was comparatively limited in scale. The main determinants behind M&As in Greece during the second half of the 1990s were the country's forthcoming accession into the euro area and the substantial drop in income this would entail, the introduction of new technology which favours M&As among banks and the need to face possible competition from foreign banks.

Over the last ten years or so, a lot of research has attempted to resolve the issue of whether M&As between banks help to improve the efficiency of the bank which comes into existence as a result, and also to what extent economies of scale exist which this new bank can exploit.

This article examines the effect of M&As in the Greek banking market over the last years on the cost and profit efficiency of financial institutions, and also looks at whether economies of scale have been exploited. In order to assess the impact of M&As on bank performance, the notion of efficiency and how M&As can lead to improved efficiency are both examined in Section 2. Section 3 gives a brief overview of studies concerning the effects of M&As. In Section 4, the results of this study on the Greek banking market are presented and an initial assessment is given of the impact of M&As both on cost and profit efficiency and on economies of scale. Finally, in Section 5, the conclusions reached from the study are summarised.

2. Reasons behind mergers and acquisitions

The reasons which give rise to a larger banking concentration via M&As usually fall into two categories (Berger *et al.,* 1999): firstly, those which concern bank shareholders, whose major concern is to maximise the value of their shares, and, secondly, those which concern bank managers or

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3 This is also the strategy pursued in the US and Japan, albeit to a lesser extent.
4 It is worth noting that, during the period 1996 - 2000, approximately 80% of the total number of bank M&As in the EU took place in four countries (Germany, Italy, France and Austria), see ECB (2000).
5 Both commercial and co-operative banks.

public authorities (e.g. the Government), who, as a rule, do not share the same motives with shareholders.[6]

Banks can maximise the value of their shares in two main ways, i.e.: (a) by increasing their efficiency and (b) by increasing their degree of monopoly power in the market. M&As can help to improve efficiency and simultaneously strengthen a bank's monopoly power as they lead to greater concentration in the market.

Efficiency has a wide meaning which can cover different aspects of banking activity. It extends from the definition of cost and/or profit efficiency which concerns the short-term period to technological efficiency concerning the long-term period. A bank is considered efficient on the cost side (X-efficient) if it minimises its cost for given prices of productive factors and for a given level of services provided. Alternatively, a bank is considered efficient on the profit side if it maximises its profits for a given combination of productive factors and the price of services provided. These definitions of efficiency focus on the way in which the productive factors of the bank are combined, and the result of this process reflects the effectiveness of bank management (in achieving the best possible use of the resources it has at its disposal). Technology and the size of the bank are taken as given (see Group of Ten, 2001).[7] By contrast, technological efficiency relates to the economies of scale and scope of services provided. A bank is technologically efficient if it acquires the optimum size and produces the best possible combination of services with given prices for the productive factors it uses.[8] As economies of scale and scope of services provided depend on technology and also on factors such as the preferences of bank

customers or the regulatory framework within which the bank operates, it is only reasonable to expect changes in the size of the bank and the structure of its assets in order for it to benefit fully from these economies. One of the ways that this can be achieved is through M&As.

In studying the possible benefits which can be obtained from M&As, it is important to distinguish between improving cost efficiency and simply reducing cost (see Rhoades, 1998). A simple reduction in cost can be achieved by cutting the number of bank employees, closing branches, merging administrative offices, etc., as a consequence of the merger. If such cost-cutting measures are accompanied by a corresponding fall in the total assets of the bank or in its income, then what has actually been achieved is simply a reduction in the size of the bank, not an improvement in its efficiency. However, if cost reduction is greater than the reduction in assets or income for the bank, chiefly as a result of restructuring and reallocating its resources (human, financial and technological), then efficiency will be increased (see Altunbas et al., 1997).

The extent of a bank's cost inefficiency is measured on the basis of the deviation of its cost from the theoretical minimum cost, a figure which is empirically proxied by the cost of the most efficient bank. According to Berger and Mester (1997), inefficiency factors which increase the

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6 Bank managers may decide on a merger with another bank for personal reasons such as greater prestige, increased salaries, etc.
7 Cost/profit efficiency is connected with the banks' short-term cost curve and with short-term changes in relative prices of the services provided.
8 It is clear that technological efficiency is linked with the banks' long-term cost curve, while economies of scope refer to long-term changes in the mix of banking services provided.

cost above this minimum level include the suboptimal response of the bank to changes in the relative prices of its inputs and the use of a larger quantity of inputs than is optimal for the production of bank services.

Turning now to technological efficiency, M&As allow banks to increase their size and thereby secure access to technology which can make cost-cutting possible, or to allocate fixed cost over a broader base, thereby reducing the average cost of providing banking services and improving their profitability (see Group of Ten, 2001). Economies of scale appear in small banks, and they may continue to exist in much larger banks, as it has been found in many countries that the average cost function for banks is U-shaped and is relatively flat at its lowest part. Benefits from the exploitation of economies of scale disappear when the bank exceeds a particular size, at which point negative economies of scale become apparent due to problems which arise in the management of large organisations.

3. Consequences of M&As between banks: brief overview of empirical research

The literature which relates to the impact of M&As on cost and profit efficiency of banks can be divided into that which uses an analysis of indicators based on balance sheet and profit and loss account data and that which uses an analysis of cost or profit functions.

Many researchers agree that M&As between banks had a limited impact on cost (excluding interest expenses). In the US, there is no consensus on the existence of positive effects on

cost from M&As. In particular, most findings from research on cost efficiency covering the 1980s and the early 1990s ranged from negative to positive, but were insignificant (see Berger and Humphrey, 1992). Only limited positive effects on the income side were reported in certain other studies that used indicators in their analysis (see Linder and Crane, 1992).[9] By contrast, studies covering recent years, which were also based on an analysis of indicators, lend support to the belief that a remarkable improvement is evident in cost efficiency, not only in small banks (see Berger, 1998) but also in large banks, provided that the acquiring bank has committed itself to cut cost (or to make its management more efficient) and the bank which is being taken over is relatively efficient (see Rhoades, 1998).[10]

However, cutting cost does not always lead to increased profits, even for large banks in the US. This can be explained by the fact that large banks often have a relatively high number of non-performing loans and find it difficult to meet the demand from small businesses for banking services (see Linder and Crane, 1992). In addition, it appears that technology can lead to a fall in the level of production which is required to minimise average cost. As a result, even small banks can offer certain services as cheaply as large ones.[11]

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9 Positive results in this period were only observed in mergers of very small banks (see Boyd and Graham, 1998).
10 In this study, out of a total of 9 M&As which were examined, improved cost efficiency was observed in only four cases. The greatest cost reductions were due to staff cuts and reduced expenditure on computer cost and software. Note that in these four cases, cuts in the number of bank employees reached approximately 50%.
11 After 1995 in the US, small banks (with assets of less than $10 billion) showed expenses per customer which were approximately 20% lower than those of large banks. By contrast, profits per customer were comparatively higher (see *Economist*, 1998).

Advances in technology are one of the factors which have led to M&As of large banks, due to the high fixed cost required by modern technology. Nonetheless, as the size of banks increases, they are better able to manage cost, but they find it more difficult to generate income efficiently (see Berger and Mester, 1997, and Chamberlain, 1998).

As for profit efficiency, studies of the 1980s and the first half of the 1990s (see Akhavein et al., 1997 and Berger, 1998) indicate a remarkable improvement accompanied by greater risk differentiation (substitution of the banks' holdings in securities with loans, increased external finance due to lower interest rates, etc.). The studies also showed that the improvement in profit efficiency is much greater for smaller banks than for large ones (see Berger and Mester, 1997).

It is worth noting that, in the 1980s, medium-sized banks in the US were relatively more efficient. In general in the US, total cost inefficiency in the banking sector ranges between 20% and 30% approximately (see Berger, 1998 and Hanweck and Shull, 1999). Against this margin, the improvement in total efficiency achieved as a result of M&As is approximately 5%.[12] Additionally, profit inefficiency ranges between 24% and 67% (see Hanweck and Shull, 1999). For the EU banking sector, estimates (covering the 1990s) of cost and profit inefficiency stand at 13-24% and 24-50% respectively (see Huizinga et al., 2001).

In more detail, results of empirical research for the EU for the 1990s conform generally to those for the US. In other words, benefits were derived from M&As between banks of the same size, but the magnitude of the benefit was not the same for every country in the EU. More specifically, M&As which took place in the period 1988-1993 within EU countries are not thought to have brought any benefits concerning cost and profit efficiency. M&As between banks of the same size or cross-border M&As are an exception to this (see Vennet, 1996). If the study of the effect of M&As is restricted geographically to France, Germany, Italy and Spain for 1988, it can be seen that benefits were realised in terms of cost for all banks, even large ones, in all four countries (see Altunbas and Molyneaux, 1996). However, these results are not confirmed by a simulation study of the cost function, which showed an increase in total cost. An exception to this were the M&As that took place between German and Italian banks (Altunbas et al., 1997).

Exploiting economies of scale appears to be the most widespread source of potential benefits from M&As, both in the US and the EU (see Berger and Mester, 1997, Altunbas and Molyneux, 1996, Group of Ten, 2001 and Huizinga, 2003). The increase in size of a bank as a result of an M&A enables it either to reduce its fixed cost per unit of output or to adopt technologies which will improve its use of capital equipment and labour, resulting in increased productivity of these factors, lower average cost and higher profitability.

The average cost function of banks shows the usual U shape (see Hughes and Mester, 1998, and Berger et al., 1999). However, in estimates of this function, the minimum cost corresponds to banks of average size. This means that

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12 According to the studies previously mentioned which used both cost functions and financial indicators.

economies of scale no longer exist when the bank begins to reach a certain size, while, when it has grown beyond that size, negative economies of scale may arise, probably due to difficulties in the management which large banks suffer from. These results have been confirmed in many cases by evidence relating to the 1980s and the 1990s.[13] In particular, in the case of M&As between large and small banks, no improvement in cost and profit efficiency has been noted and the mergers have been attributed either to the desire on the part of managers of large banks to increase the bank's size or to the belief that a bank which comes into existence as a result of a merger will be "too big to fail." As to M&As between small banks, the improved performance of the new bank is attributed to the exploitation of economies of scale, while the positive results of M&As between large banks are explained by the improvement in the operating efficiency of their management, especially as far as cost and the risk reduction ensured by broadening the total range of services offered are concerned (see Vennet, 1996).[14]

As for cross-border M&As, it has been observed that these lead to a small fall in cost only in cases where one of the two banks has a relatively high capital intensity and the other has a relatively high labour intensity (see Altunbas *et al.,* 1997).

Measuring economies of scope proves to be extremely difficult, as, in theory, the reference point must be a firm which produces one product in order for the cost or income function to be calculated. Generally, it has been found that M&As between banks lead to economies as a result of synergies, but that these economies are limited (see Allen and Rai, 1996).

4. Empirical analysis for Greek banks

In this paper, financial indicators are used to study the impact of M&As on the cost and profit efficiency of banks in Greece and on economies of scale. The analysis is based on information taken from bank balance sheets and profit and loss accounts.[15]

The impact of M&As between Greek commercial banks (see Table 1) on their cost and profit efficiency is examined first. More specifically, to estimate this impact, the margin for improvement in cost and profit efficiency in the period before the M&As must be calculated and compared with that in the period after the M&As, so that the extent of any eventual improvement can be ascertained. With this aim in mind, three methods can be applied. Each method complements the others and as a result they all allow us to deal with certain shortcomings associated with the use of indicators (difficulty in keeping certain factors constant —the *ceteris paribus* assumption— etc). The methods are as follows:

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13 Estimates based on cost functions showed that, for European banks, there is a negative correlation between margins for the exploitation of economies of scale and the size of the bank (see Huizinga, 2003).
14 However, recent studies have shown that, for large banks, margins may exist for the exploitation of economies of scale (see Vennet, 2002).
15 The use of econometric models here is not feasible due to the limited number of observations. The benefits derived from M&As may also be measured on the basis of an evaluation of the reaction of stock markets to announcements of specific M&As. Using this approach, if the merger is to bring any benefit, then the stock market value of the bank coming into existence as a result of an M&A must be greater than the sum of the stock market value of the individual banks which are merging. However, the approach adopted in this paper, which is based on the analysis of financial indicators, is considered to measure the actual performance of banks for a relatively long period, rather than short-term expectations of investors in the stock market. As a result, it is more reliable than an analysis based on bank share prices. For a fuller analysis of this issue, see Piloff and Santomero (1998).

Table 1

Mergers and acquisitions of banks in Greece in the period 1997-2002

| Year | Acquiring bank | | Absorbed bank(s) | |
	Bank/Securities Company	Assets[1]	Bank(s)	Assets[1]
1997				
10.10.97	EFG Eurobank	305	Interbank	197
23.10.97	Piraeus Bank	188	Chase Manhattan (Greek branches)	72
22.12.97	National Real Estate Bank	2,192	National Mortgage Bank	124
1998				
02.10.98	National Bank	9,803	National Real Estate Bank	2,516
27.10.98	Piraeus Bank	319	Credit Lyonnais Grèce	76
1999				
12.03.99	Bank of Athens[2]	117	EFG Eurobank	945
29.06.99	Piraeus Bank	670	Nat. Westminster (Greek branches)	386
13.07.99	Telesis Securities S.A.	16	Dorian Bank	85
30.07.99	Bank of Central Greece[3]	178	Egnatia Bank	263
04.10.99	EFG Eurobank	1,290	Bank of Crete	401
2000				
26.04.00	Alpha Credit Bank	5,904	Ionian and Popular Bank	1,991
16.06.00	Piraeus Bank	1,525	Macedonia-Thrace Bank	830
			Xios Bank	676
07.09.00	EFG Eurobank	2,575	Ergobank	2,186
2001				
30.11.01	EFG Eurobank-Ergasias	5,245	Telesis Investment Bank	302
2002				
20.12.02	National Bank	16,304	National Investment Bank for Industrial Development	397

Note: The date of the merger/acquisition is based on its registration in the Registry of Sociétés Anonymes of the Ministry of Development (Article 74 of Law 2190/1920, which was supplemented by Article 12 of Presidential Decree 498/1987). The merger of Telesis Securities S.A. and the Dorian Bank is an exception, as, in this case, the date used is that of the exchange of shares.
1   Level of assets (in billion drachmas) at the end of the year prior to the merger; for the merger of the Bank of Athens and EFG Eurobank: asset level at 31.7.1998.
2   Merger by absorption of Eurobank by the Bank of Athens and renaming of the latter to EFG Eurobank, Government Gazette 1503/17.3.99.
3   Merger by absorption of Egnatia Bank by the Bank of Central Greece and renaming of the latter to Egnatia Bank, Government Gazette 6357/3.8.99.
Source: Bank of Greece.

Firstly, analysis of the developments of certain cost and profit indicators and of their dispersion between groups of banks classified according to their size.

Secondly, calculation of the banks' cost and profit (in)efficiency in comparison with the bank with the best performance.

Thirdly, comparison of bank performance concerning cost and profits for individual merger cases during the period before and after the merger with the performance of banks which did not participate in any M&A.

In addition, the existence of economies of scale and their exploitation because of the merger are examined.

4.1 The impact of M&As on cost and profit efficiency of Greek commercial banks

4.1.1 Calculation of performance indicators for banks and of their dispersion

In this section, income, cost, profit and productivity indicators are calculated for bank groups according to their size for the period prior to the

M&As (1994-1997) and after (2000-2002), and the dispersion of these indicators. The comparison of average performance and its dispersion for each bank group between the two periods is considered to offer an adequate picture of the impact of M&As on individual groups and on the deviation between the best and the worst performer within each group.

More analytically, indicators of income (excluding interest income), as well as of operating expenses as a percentage of total bank income and the return on equity indicator (ROE)[16] are calculated. Similarly, productivity indicators for labour, capital and total assets are calculated (see Appendix for the definition of indicators). The above indicators have been constructed separately for each of the four size groups into which Greek commercial banks have been classified on the basis of their average assets during both periods.[17] The size brackets for the period 1994-1997 were set (in bill. drachmas) at 0-200 for Group 1, 201-400 for Group 2, 401-2,000 for Group 3 and 2,001- for Group 4. During the second period, 2000-2002, the brackets were revised upwards by 50%, in line with the corresponding increase in the average level of nominal GDP between the two periods 1994-1997 and 2000-2002, i.e. they were set at 0-300, 301-600, 600-3,000 and 3,001- respectively.[18] Note that Group 1 does not appear in the table with the results for the second period, as no bank is included in the corresponding size bracket due to the substantial growth in the size of banks, which partly reflects the M&As that took place.

For each group, the average for each indicator has been calculated, together with the size of the indicator for the 25% of banks showing the best and

the worst performance for this indicator and the percentage deviation from (the average of) the indicator for the best and the worst 25%, which is the measure of dispersion utilised.

Bank performance in terms of income, operating expenses and profitability for the periods 1994-1997 and 2000-2002 is presented in Tables 2 and 4. A comparative examination of these two tables shows that the performance of banks in Group 4 (which includes all banks which have resulted from M&As, with the exception of one bank which is included in Group 3), was comparatively better in terms of return on equity and, mainly, in terms of cost. Thus, M&As appear to have had a beneficial effect overall on the performance of banks which merged.

In addition, an examination of the dispersion of performance within Groups in the period 1994-1997 reveals a greater dispersion of profitability than of the other two indicators, which is wider for Groups 1 and 4. This dispersion appears to be associated with that of cost and income indicators, except in the case of Group 3, which is entirely a reflection of the dispersion of the cost indicator. This reveals the existence of significant margins for improved profit efficiency in all groups but mainly in Groups 1 and 4. It must be emphasised that, during this period, the Greek banking market was

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16 To calculate this indicator, average equity over two successive years is used, and not end-of-year equity. This is because profit is a flow generated during the year and as a result is more closely linked with the average stock of equity.
17 Such a classification of banks into groups is dictated among other things by the effort to keep constant the impact of other factors which affect the development of these indicators, since the analysis based on indicators is univariate.
18 Had the revision of the brackets been made on the basis of the development of the banks' average assets, the resulting brackets would have included the impact of M&As.

Table 2

Greek commercial banks: performance and measures of dispersion according to level of assets, 1994-1997

(Period averages)

| Indicators | Average assets (in billion drachmas) | | | | | | | | | | | |
| | Group 1: (0 – 200) | | | Group 2: (201-400) | | | Group 3: (401-2,000) | | | Group 4: (2,001-) | | |
	Average	Best 25%	Worst 25%	Average	Best 25%	Worst 25%	Average	Best 25%*	Worst 25%*	Average	Best 25%	Worst 25%
Non-interest income (% of total income)	42.8	51.6 (20.6)	31.8 (−25.7)	40.1	45.3 (13.0)	31.1 (−22.4)	39.6	40.0 (1.0)	39.4 (−0.5)	49.5	64.1 (29.5)	25.8 (−47.9)
Operating expenses (% of total income)	79.9	65.7 (−17.8)	100.1 (25.3)	73.6	60.6 (−17.7)	79.9 (8.6)	56.0	34.7 (−38.0)	79.9 (42.7)	66.8	47.3 (−29.2)	82.8 (24.0)
Return on equity[1]	9.9	18.2 (83.8)	−5.4 (−154.5)	16.5	27.5 (66.7)	3.9 (−76.4)	33.8	64.6 (91.1)	9.2 (−72.8)	18.0	43.5 (141.7)	3.9 (−78.3)

Note: Figures in parentheses show the percentage deviation from the average.
1 For a definition of the indicator, see the Appendix to the text.
* In this case, the indicators refer to a range of 50%.
Source: Balance sheets and profit and loss accounts.

Table 3

European commercial banks: performance and measures of dispersion according to level of assets, 1994-1997

(Period averages)

| Indicators | Total assets (in billion dollars) | | | | | | | | | | | |
| | Group 1 : (0-5) | | | Group 2: (6-20) | | | Group 3: (21-50) | | | Group 4: (51-) | | |
	Average	Best 25%	Worst 25%	Average	Best 25%	Worst 25%	Average	Best 25%	Worst 25%	Average	Best 25%	Worst 25%
Non-interest income (% of total income)	19.2	23.7 (23.4)	14.2 (−26.0)	24.6	32.1 (30.5)	15.1 (−38.6)	20.2	31.9 (57.9)	13.3 (−34.2)	30.8	37.3 (21.1)	23.9 (−22.4)
Operating expenses (% of total income)	63.1	57.5 (−8.9)	68.7 (8.9)	61.6	53.4 (−13.3)	70.4 (14.3)	55.6	34.4 (−38.1)	69.3 (24.6)	65.5	58.0 (−11.5)	73.8 (12.7)
Return on equity[1]	7.1	8.8 (23.9)	5.4 (−23.9)	7.4	9.7 (31.1)	4.7 (−36.5)	7.2	9.0 (25.0)	5.6 (−22.2)	8.2	9.9 (20.7)	4.8 (−41.5)

Note: Figures in parentheses show the percentage deviation from the average.
1 For a definition of the indicator, see the Appendix to the text.
Source: Group of Ten (2001), pp. 250–1.

Table 4

Greek commercial banks: performance and measures of dispersion according to level of assets, 2000-2002

(Period averages)

| Indicators | Average assets (in billion drachmas) | | | | | | | | |
| | Group 2: (301-600) | | | Group 3: (601-3,000) | | | Group 4: (3,001-) | | |
	Average	Best 25%	Worst 25%	Average	Best 25%*	Worst 25%*	Average	Best 25%	Worst 25%
Non-interest income (% of total income)	37.0	42.1 (13.8)	29.6 (−20.0)	35.7	37.2 (4.2)	34.3 (−3.9)	37.6	44.5 (18.4)	25.4 (−32.4)
Operating expenses (% of total income)	90.6	63.4 (−30.0)	228.8 (152.5)	75.6	60.8 (−19.6)	90.0 (19.0)	58.0	55.4 (−4.5)	63.6 (9.7)
Return on equity[1]	−0.2	13.3 (6,750.0)	−24.8 (−12,300.0)	6.7	13.5 (101.5)	−1.7 (−125.4)	17.1	21.7 (26.9)	11.4 (−33.3)

Note: Figures in parentheses show the percentage deviation from the average.
The upper and lower limits for each group have been revised for this period on the basis of the rate of change in nominal GDP. Group 1 no longer includes any commercial bank due to the growth in bank size.
1 For a definition of the indicator, see the Appendix to the text.
* In this case, the indicators refer to a range of 50%.
Source: Balance sheets and profit and loss accounts.

characterised by the establishment of new banks and the fall in the degree of concentration, as measured by the Herfindhal-Hirschman (H-H) index (1993: 1,153, 1997: 950).[19]

The cost and profit efficiency shown by Greek commercial banks may be compared with that of European commercial banks during the same period.[20] These results appear in Table 3. In particular, it can be seen that Greek banks, when compared with European banks, showed higher return on equity for all groups. Cost for Groups 1 and 2 was higher, while for Groups 3 and 4 it was at approximately the same level.[21] In addition, the return on equity indicator for European banks shows a smaller dispersion than for Greek banks for all the size brackets. This dispersion among European banks should be attributed to income

rather than cost. It therefore appears that there was greater margin for improvement on the income side and comparatively less margin on the cost side, which had already been favourably affected by the M&As that had taken place.

By comparing the dispersion of performance of Greek commercial banks in the two periods under examination, it becomes clear that M&As have contributed to the improvement of cost and profit efficiency. Indeed, Table 4 shows that, in Group 4, all the performance indicators, particularly return on equity, show a reduced dispersion in compar-

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19 The H-H index is calculated by the Bank of Greece.
20 It must, however, be emphasised that throughout the period under examination, bank M&As in Europe took place earlier.
21 For the relation between size brackets of Greek and European banks, see Section 4.2.

Table 5
Greek commercial banks: performance and measures of dispersion according to level of assets, 1994-1997

(Period averages)

| Indicators[1] | Average assets (in billion drachmas) | | | | | | | | | | | |
| | Group 1: (0-200) | | | Group 2: (201-400) | | | Group 3: (401-2,000) | | | Group 4: (2,001-) | | |
	Average	Best 25%	Worst 25%	Average	Best 25%	Worst 25%	Average	Best 25%*	Worst 25%*	Average	Best 25%	Worst 25%
Labour productivity	33.5	54.5 (62.7)	25.6 (−23.6)	37.7	80.3 (113.0)	27.8 (−26.3)	48.9	60.0 (22.7)	43.0 (−12.1)	59.8	112.4 (88.0)	51.8 (−13.4)
Average salary at constant prices	6.4	3.6 (−43.7)	7.1 (10.3)	6.1	5.9 (−3.4)	7.0 (14.6)	6.6	5.9 (−10.1)	6.9 (5.2)	8.0	6.9 (−13.8)	10.2 (27.5)
Capital productivity	1.4	1.5 (8.7)	1.2 (−13.0)	1.4	1.4 (5.1)	1.3 (−4.4)	1.4	1.7 (17.4)	1.3 (−10.2)	1.3	1.5 (14.6)	1.2 (−7.7)
Assets productivity	13.7	16.4 (19.7)	9.2 (−32.8)	14.2	16.6 (16.9)	12.7 (−10.6)	12.6	13.6 (7.9)	11.9 (−5.6)	11.7	12.7 (8.2)	9.6 (−17.9)
Profit margin	9.6	19.6 (104.2)	0.6 (−93.8)	10.7	14.7 (36.9)	8.1 (−24.6)	21.2	46.8 (120.8)	7.4 (−65.1)	10.6	27.7 (161.3)	2.5 (−76.4)

Note: Figures in parentheses show the percentage deviation from the average.
1 For a definition of the indicator, see the Appendix to the text.
* In this case, the indicators refer to a range of 50%.
Source: Balance sheets and profit and loss accounts.

ison with the 1994-1997 period. Note that, during the three-year period 2000-2002, the degree of concentration within the banking market increased (H-H index 1999: 986, 2002: 1,164). The bank performance indicators for Group 3 present a mixed picture, i.e. improved cost efficiency and a small deterioration in profit efficiency. By contrast, cost and profit efficiency for banks in Group 2 show a substantial decline.

In order to get a better understanding of the improvement observed in profit efficiency, the impact of M&As on the existing margins for improvement in labour, capital and total assets productivity on the part of banks was also examined. M&As can help to increase productivity in the short term through factors such as changes in the regulations relating to the internal organisation of the bank (including improved incentives and internal audit procedures), risk differentiation (e.g. shift in the bank's portfolio out of securities and into loans) etc. The results of the calculations presented in Tables 5 and 6 and in Chart 1 indicate that M&As helped to improve labour and capital productivity in Group 4 (which includes almost all the banks which came into existence as a result of M&As), but made no contribution towards improving total assets productivity. They also helped to limit the dispersion of labour productivity in Group 4, particularly in the top 25% of banks in this group. By contrast, this group showed no improvement in the dispersion of capital and total assets productivity.

(Period averages)

| Indicators[1] | Average assets (in billion drachmas) | | | | | | | | |
| | Group 2: (301-600) | | | Group 3: (601-3,000) | | | Group 4: (3,001-) | | |
	Average	Best 25%	Worst 25%	Average	Best 25%*	Worst 25%*	Average	Best 25%	Worst 25%
Labour productivity	43.1	52.5 (21.8)	29.3 (–32.0)	40.9	51.1 (24.9)	34.5 (–15.6)	76.4	82.6 (8.1)	62.7 (–17.9)
Average salary at constant prices	9.4	7.7 (–18.1)	10.7 (13.8)	9.8	9.7 (–1.0)	9.9 (1.0)	12.9	10.8 (–16.3)	14.7 (14.0)
Capital productivity	1.4	1.8 (28.6)	0.9 (–35.7)	1.6	1.8 (12.5)	1.5 (–6.3)	1.6	1.9 (18.8)	1.5 (–6.3)
Assets productivity	6.8	8.9 (30.9)	5.5 (–19.1)	9.0	9.6 (6.7)	8.6 (–4.4)	7.9	8.6 (8.9)	2.6 (–67.1)
Profit margin	5.6	26.3 (369.6)	–35.8 (–739.3)	18.0	32.0 (77.8)	7.4 (–58.9)	26.4	32.3 (22.3)	23.0 (–12.9)

Note: Figures in parentheses show the percentage deviation from the average.
The upper and lower limits for each group have been revised for this period on the basis of the rate of change in nominal GDP. Group 1 no longer includes any commercial banks due to their enlargement.
1   For a definition of the indicator, see the Appendix to the text.
*   In this case, the indicators refer to a range of 50%.
Source: Balance sheets and profit and loss accounts.

4.1.2 Assessment of the degree of cost and profit (in)efficiency

So far, the analysis has been based on the comparison of financial indicators, such as cost, income except from interest, and profitability, as well of as their dispersion, before and after the M&As. The dispersion of cost and profitability indicators shows the gap that exists between the best and the worst performances. However, in order to evaluate the degree of cost and profit (in)efficiency, a comparison with the best performer is required. The gap between each of the banks (or group of banks) and the best performing bank is a measure of the former's (in)efficiency. This method offers a satisfactory measure of (in)efficiency. Alternatively, this may be calculated on the basis of estimates of cost and profit functions.[22]

Cost (in)efficiency (on the basis of operating expenses as a percentage of total income) and profit (in)efficiency (on the basis of return on equity) were measured for both periods, before and after M&As, and also for the individual groups of banks which have already been mentioned, as well

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22 Any measurement of (in)efficiency arrived at using the method which employs financial indicators may be significantly affected if the bank showing the best performance is an outlier of the banks in the sample. However, this is not the case in this study, at least for the main performance indicators.

Chart 1

Productivity[1] of Greek commercial banks according to level of assets
(Period averages)

(A) Labour productivity

(B) Capital productivity

(C) Assets productivity
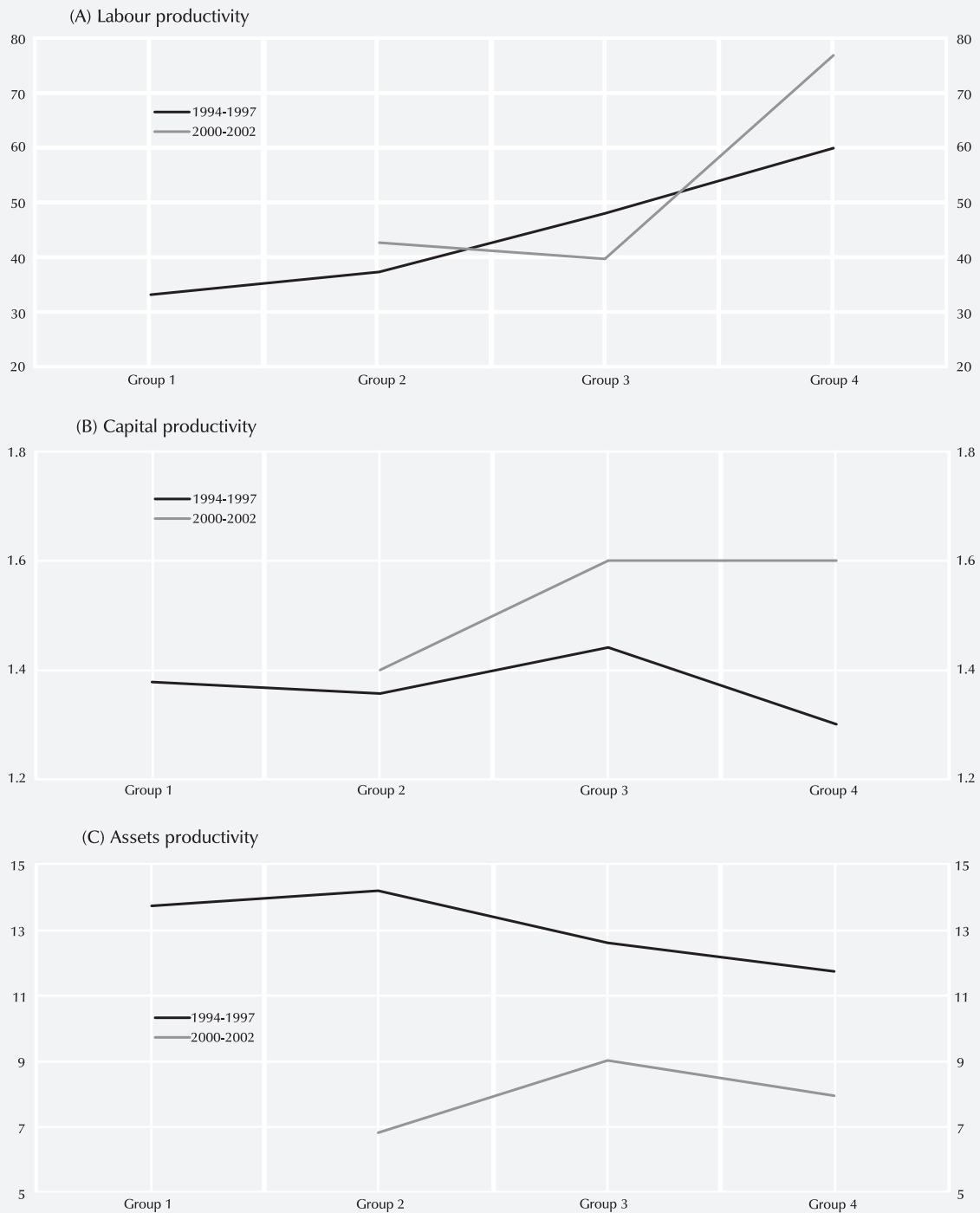
1 For a definition of the indicators, see the Appendix to the text.

Source: Bank of Greece.

Table 7

Relative indicators of cost and profit efficiency of Greek commercial banks
(comparison with the best performing bank[1]): 1994-1997

Indicators	Average assets (in billion drachmas)				
	Group 1 (0-200)	Group 2 (201-400)	Group 3 (401-2,000)	Group 4 (2,001-)	All banks
A) Cost efficiency:					
— Operating expenses (% of total income)	230.3	212.1	161.4	192.5	177.8
— Staff cost (% of total income)	224.4	218.0	169.8	239.5	226.3
— Average salary at constant prices	120.9	115.3	123.8	150.9	142.1
B) Profit efficiency:					
— Non-interest income (% of total income)	66.8	62.6	61.8	77.2	73.0
— Return on equity	15.3	25.5	52.3	27.9	30.0
— Labour productivity	27.1	30.5	39.6	48.4	44.1
— Capital productivity	80.2	79.1	84.2	75.6	76.7
— Assets productivity	82.5	85.5	75.9	70.5	72.3
— Profit margin	20.5	22.9	45.3	22.6	25.0

1 The best performance equals 100.
Source: Balance sheets and profit and loss accounts.

as for all banks. The relevant findings are presented in Tables 7 and 8.[23] Examination of the results for the period 1994-1997 shows the following:

Firstly, all banks show a high level of cost inefficiency. This is mainly due to total staff cost, and in particular to the number of staff employed. More analytically, cost inefficiency shows a noticeable fall between Group 1 and Group 3 and a rise between Group 3 and Group 4. The latter is particular marked as far as staff cost is concerned. By contrast, cost inefficiency as measured on the basis of labour cost (real average wage) falls between Group 2 and Group 1, but then rises again. In all the above entioned cases, cost inefficiency in Group 4 is higher than for all banks.

Secondly, profit inefficiency for all banks is very high (70%), which can be explained both by the

already mentioned cost inefficiency and by profit inefficiency in terms of, mainly, labour productivity and, to a lesser degree, capital and total assets productivity.

Thirdly, profit inefficiency falls impressively between Group 1 and Group 3, rising again considerably in Group 4. This relationship between profit inefficiency and the size of the bank reflects the relationship between cost and the size of the bank, rather than the corresponding relationship of productivity.

Table 8 shows cost and profit inefficiency of

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23 With cost indicators, inefficiency is measured in terms of the upward deviation of the indicator in question from 100 (representing the bank with the best performance), whereas for profit indicators the measurement is made in terms of the downward deviation.

Table 8

Relative indicators of cost and profit efficiency of Greek commercial banks
(comparison with the best performing bank[1]): 2000-2002

Indicators	Average assets (in billion drachmas)			
	Group 2 (301-600)	Group 3 (601-3,000)	Group 4 (3,001-)	All banks
A) Cost efficiency:				
— Operating expenses (% of total income)	165.0	137.7	105.6	108.9
— Staff cost (% of total income)	155.7	141.8	127.9	129.3
— Average salary at constant prices	122.1	127.3	167.5	163.1
B) Profit efficiency:				
— Non-interest income (% of total income)	81.9	79.0	83.2	83.0
— Return on equity	-0.8	26.2	66.8	62.1
— Labour productivity	52.0	49.3	92.2	87.6
— Capital productivity	70.0	80.0	80.0	80.0
— Assets productivity	70.8	93.8	82.3	82.3
— Profit margin	15.7	50.6	74.2	71.1

1 The best performance equals 100.
Source: Balance sheets and profit and loss accounts.

Greek commercial banks on the basis of the best performing bank in the period following the M&As (2000-2002). Examination of the table shows that:

Firstly, the cost inefficiency of all banks is reduced significantly compared with the period 1994-1997 when calculated on the basis of operating expenses or staff cost. However, it increases when calculated on the basis of real average wages.

Secondly, the reduction in cost inefficiency is evident in all the groups of banks, particularly in Group 4, which includes almost all the M&As in the banking sector.

Thirdly, profit inefficiency for all banks remains at a high level (38%), even though it has been reduced to a large extent. This fall is due to the drop both in cost inefficiency and in inefficiency measured on the basis of labour productivity and, to a lesser extent, on the basis of productivity of capital and total assets.

Fourthly, the picture shown by the profit inefficiency of all banks is exclusively the result of the performance of Group 4, since in the other two groups an increase in inefficiency was observed. The improved performance in Group 4 can be attributed to the same reasons mentioned for all banks.

4.1.3 Analysis of individual cases of bank M&As on the basis of indicators of change in relative cost and relative profitability

Table 1 shows that in the period 1997-2002, 11 M&As took place between Greek commercial

banks. In order for us to have a direct evaluation of the relationship between individual cases of bank M&As and cost and profit efficiency, our analysis should focus in each case on looking at how banks which merged performed before and after the merger and comparing this with the performance of banks which have not taken part in any M&A. This change in performance will reflect the impact of M&As and not a change in the economic environment. For this purpose, we use an indicator of the change in relative operating cost (total cost and its components) or relative profitability due to M&As (see Kwan and Wilcox, 1999), which is defined as follows:

$$RP = \left[\overline{X}_a - \overline{X}_a^\lambda \right] - \left[\overline{X}_b - \overline{X}_b^\lambda \right], \qquad (1)$$

where:

RP = indicator of change in relative performance: cost (RPc) or profits (RPp)

b, a = refer to the period before and after the mergers, respectively

$\overline{X}_b$ = average of cost or profitability indicator for merging banks during the period before the merger

$\overline{X}_a$ = the corresponding indicator for the bank which resulted from the merger in the period after the merger

$\overline{X}_b^\lambda, \overline{X}_a^\lambda$ = the above indicators for banks which have not taken part in an M&A.

On the basis of relationship (1), we have:

(a) an improvement in cost efficiency when:

RPc < 0

(b) an improvement in profit efficiency when:

RPp > 0

In each case of M&A which is examined, a common set of indicators is calculated, which includes four cost and two profitability indicators. The cost indicators (total cost less interest expenses, staff salaries, expenses for fixed assets[24] and other expenses) have been calculated as the ratio of the respective expenses to average total assets,[25] in order to pinpoint any improvement in cost efficiency rather than simply show the reduction in cost. As for the calculation of profit efficiency, two measures of profitability were used, return on assets (ROA) and return on equity (ROE). The first measure reflects in principle the ability of a bank to create profits from disposable assets. It, however, overestimates profitability since it is affected by the bank's off-balance sheet activities. Alternatively, ROE measures return on the equity of shareholders of the bank, but is affected by management decisions involving both the proportion of equity to the bank's loan capital and the total level of the bank's capital. These two indicators are linked by the relationship:

$$\frac{P}{E} = \frac{P}{A} \cdot \frac{A}{E}, \qquad (2)$$

where:

P = profits (before tax)
E = equity
A = total assets

The ratio A/E in relationship (2), which is often referred to as the "equity multiplier," measures the leverage of the bank and is shown in Table 9.

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24 This refers to depreciation of fixed and intangible assets.
25 See also footnote 16.

Table 9

Indicators of change in relative operating cost and relative profitability as a result of mergers and acquisitions of Greek commercial banks[1]

Cases of mergers and acquisitions	Period[2]	Operating cost				Profitability		
		Total non-interest expenses	Staff salaries	Expenses for fixed assets	Other expenses	ROA	(A/E)[3]	ROE
A.	1996-1997	0.25	0.20	0.05	0.01	0.12	2.14	2.37
B.	1997-1998	−2.36	−1.21	−0.29	−0.86	−1.12	−1.93	−15.42
C.	1995-2002	−1.44	−1.54	−0.21	0.32	0.27	8.78	13.04
D.	1998-1999	1.18	0.29	0.25	0.64	−0.95	3.96	−9.98
E.	1999-2000	0.76	0.23	0.12	0.40	1.60	1.60	17.16
F.	1994-2001	0.48	0.30	0.11	0.10	−0.25	−5.31	11.68
G.	1997-2002	−0.77	-0.52	-0.09	-0.17	−0.37	7.71	10.96
H.	1997-2002	0.03	-0.04	-0.03	0.12	0.16	3.29	5.27

1 For a definition of these indicators, see Section 4.1.3 of the text.
2 Includes an equal number of years before and after the year of the merger.
3 Ratio of assets to equity.
Source: Balance sheets and profit and loss accounts.

Chart 2

Change in relative operating cost and relative return on equity (ROE) as a result of mergers and acquisitions of Greek commercial banks
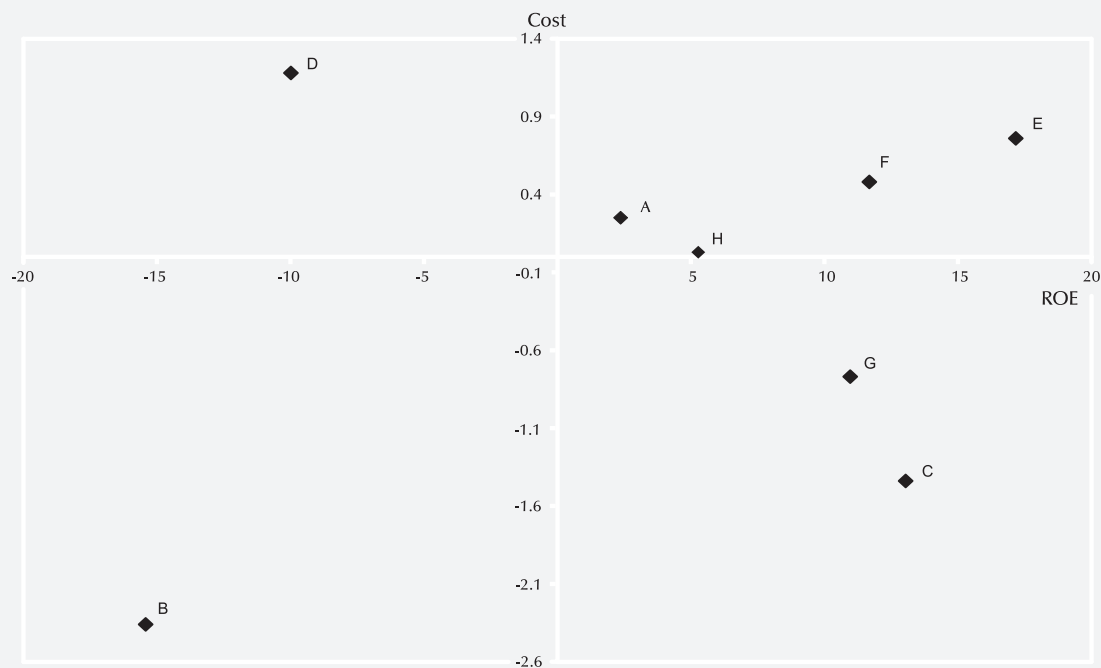
Source: See Table 9.

Change in relative operating cost and relative return on assets (ROA) as a result of mergers and acquisitions of Greek commercial banks
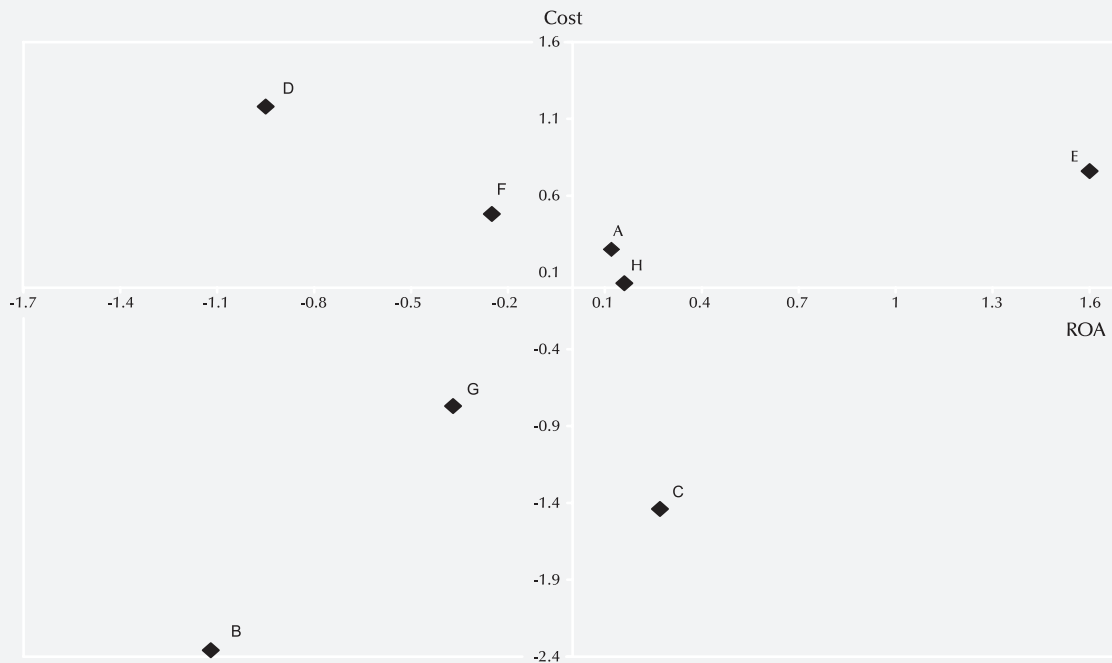
Source: See Table 9.

Indicators of change in relative cost and profitability have been calculated for 8 of the 11 cases of Greek commercial bank M&As. In 2 of the 3 other cases, the available data for the periods before and after the mergers were not comparable, as new M&As took place immediately afterwards involving the same banks. In the remaining case, data were insufficient. The results of calculating the above indicators for the 8 M&As referred to above are presented in Table 9. In 4 of these cases, the indicators were calculated over a period of three (or four) years before and after the merger, while in the other cases the period before and after the merger was limited to one year.[26]

Table 9 shows that 3 of the 8 cases of M&As, (B, C and G) involved a decrease in the relative cost

indicator (RPc < 0), i.e. there was an improvement in cost efficiency, and 6 cases (A, C, E, F, G and H) involved an increase in the relative return on equity indicator (ROE), while just four cases (A, C, E and H) involved an increase in relative return on assets (ROA) (RPp > 0), i.e. there was an improvement in profit efficiency (see Charts 2 and 3).

In all cases of improved cost efficiency, this was mainly the result of a fall in the staff cost and involved M&As among small and medium-sized

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26 M&As case studies carried out in the US showed that approximately half of any improvement in efficiency becomes evident after a period of one year, and all of the improvement is achieved within three years (see Rhoades, 1998).

banks (1994-1997: Groups 1 and 2), while M&As which involved larger banks (Groups 3 and 4) resulted in a deterioration in cost efficiency. As for profit efficiency, it has been observed that, of the 6 cases where this improved, cost contributed to the improvement in only 2 cases, (C and G), while in the other cases (A, E, F and H) it was factors other than cost which were behind the improvement, namely the differentiation of services provided by banks, not only to depositors but also to borrowers, and improved productivity.

4.2 Correlation between size of bank and economies of scale

In order to ascertain the existence of economies of scale and the extent to which they are exploited through M&As, the correlation between the size of banks and their operating cost is examined for the period before and after the M&As, i.e. the periods 1994-1997 and 2000-2002.[27] Table 2 and Chart 4B show that, in the period 1994-1997, operating expenses as a percentage of total income fall from Group 1 to Group 3 and rise from Group 3 to Group 4. In particular, operating expenses as a percentage of income fall from 79.9% in Group 1 to 73.6% in Group 2 and 56% in Group 3. Thereafter, they increase to 66.8% in Group 4. This means that, in this period, economies of scale appear to exist to the extent that the size of a bank grows from small (Group 1) to medium (Group 3). By contrast, large banks (Group 4) are characterised by negative economies of scale.

This behaviour of cost in relation to the size of Greek banks during the period under examination was similar to that which was observed in the case of other European banks (see Table 3, Chart 4B and footnote 13). Of course, the average size

of European banks which corresponds to the lowest cost is approximately seven times that of Greek banks, reflecting the relative size of the two banking markets. Table 2 and Chart 4C also indicate that Greek banks' return on equity rises as we move to Group 3, but falls sharply in Group 4, thereby confirming the conclusions noted in connection with the correlation between cost and the size of the bank.

The relationship between size and cost in Greek commercial banks in the period 2000-2002 is presented in Table 4 and Chart 4B. In particular, operating expenses show a continued fall at an increasing rate between Group 2 and Group 4. This fact highlights the existence of economies of scale throughout the whole size range of Greek banks during this period, in contrast with the previous period 1994-1997, when, as already mentioned, Group 4 presented negative economies of scale.[28] This result is attributed basically to M&As which, in effect, took place in the period after 1997, although it cannot be ruled out that other factors may have played a role, such as the intro-

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[27] As noted in Section 2, to pinpoint and evaluate economies of scale, it is essential to assess the cost of banks which use the optimum combination of productive factors and how this cost changes with the size of the banks. Given that this presupposes an estimation of cost functions, the results of any analysis based on indicators must be considered as indicative only. For a similar assessment of economies of scale using indicators, see Group of Ten (2001).

[28] Voloudakis (2002) uses labour, assets and total productivity indicators (the weighted total of the other two indicators), which he calculates for the year 1999 by category of bank size in order to investigate the existence of economies of scale. He concludes that small to medium-sized banks enjoy economies of scale, whereas, by, contrast, medium-sized to large banks experience negative economies of scale. His results are not confirmed in this paper as far as labour productivity is concerned, but are confirmed for assets productivity (see Tables 5 and 6 and Chart 1). Note, however, that in this study labour productivity is defined as the ratio of total gross income at constant prices to the number of staff employed by banks, while Voloudakis uses total gross income at current prices to calculate the indicator.

Chart 4

Performance of Greek and European commercial banks according to level of assets
(Period averages)

(A) Non-interest income (% of total income)

Greek: 1994-1997
Greek: 2000-2002
European: 1994-1997

(B) Operating expenses (% of total income)

Greek: 1994-1997
Greek: 2000-2002
European: 1994-1997

(C) Return on equity[1]

Greek: 1994-1997
Greek: 2000-2002
European: 1994-1997
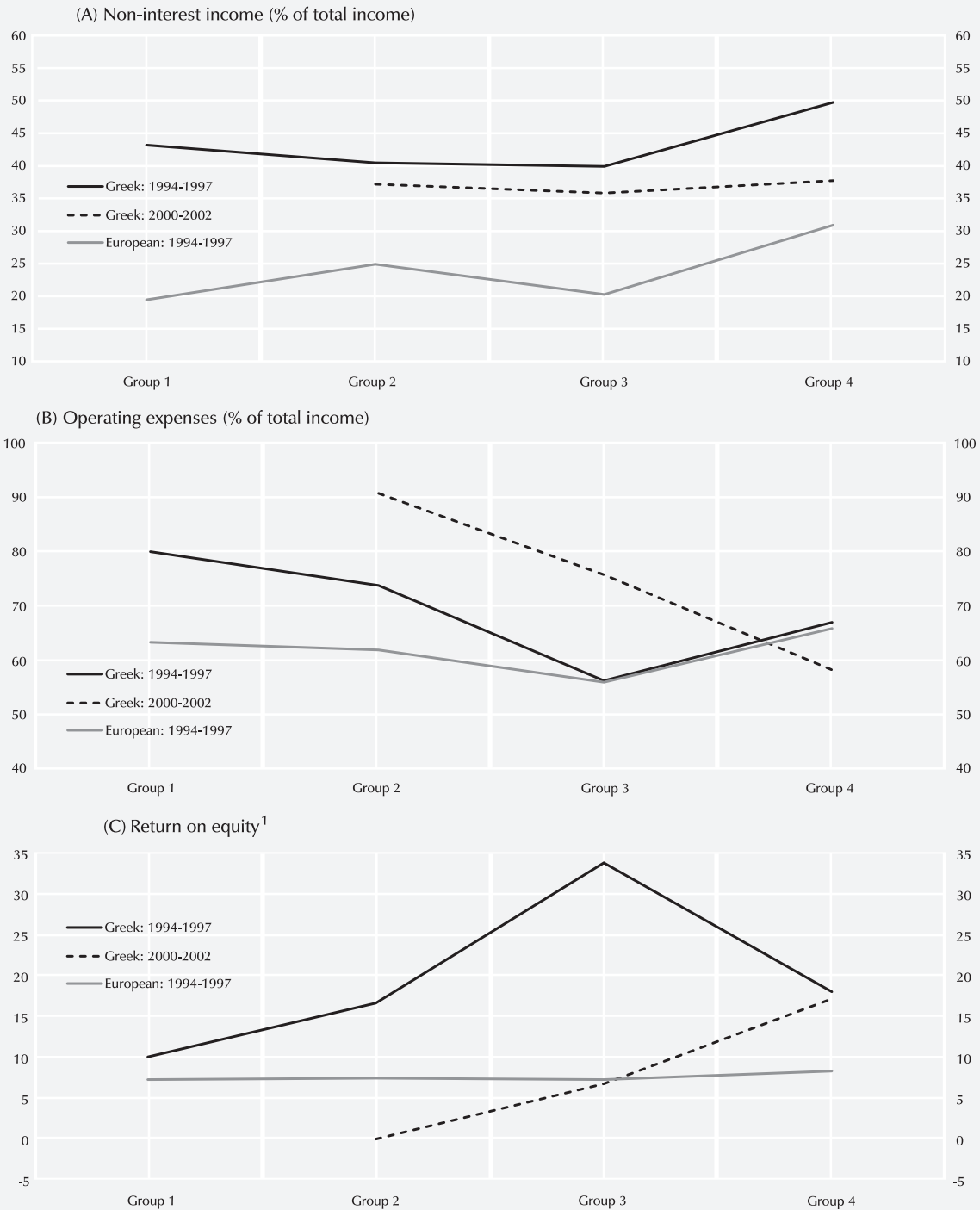
1 For a definition of the indicator, see the Appendix to the text.

Sources: Bank of Greece and Group of Ten (2001).

duction of new technology, increased bank liquidity due to harmonisation of reserve requirements in Greece with the system in force in the Eurosystem, etc.

By comparing the two periods 1994-1997 and 2000-2002 (see Chart 4), it can be seen that in the first period the larger banks managed through successful M&As to exploit existing economies of scale. In addition, by increasing in size, they managed to use technologies which contributed to cost reduction and were also able to spread total fixed cost over a larger base and thus to reduce average cost and increase profitability. It should be remembered that these results are not due to the growth in the Greek banking market which followed the general increase in economic activity of the country during the period under examination, as the banks' size brackets, as noted above, have been adjusted in line with the growth rate of nominal GDP. A feature of cost developments is the fact that operating expenses as a percentage of total income in Group 4 fell by 9 percentage points, whereas in Groups 2 and 3 rose by 17 and 20 percentage points respectively. Return on equity rose as banks increased their total assets. Reflecting the negative relationship between cost and bank size, return on equity rose from almost zero in Group 2 to 7% in Group 3 and more than doubled to 17% in Group 4.

5. Conclusions

M&As in Greece began to take place in the second half of the 1990s in view of the country's accession into the European Monetary Union and the trend towards consolidation of financial institutions internationally against the backdrop of increasing integration of financial markets. This paper has examined the M&As which occurred in the banking sector, the main reasons behind them, and their effect on bank efficiency and the scale of banks' operations. We hope that the results of this study will facilitate understanding of developments in the banking market in recent years, assessing the impact of M&As and forecasting future trends.

To minimise the effect of any weaknesses inherent in the use of financial indicators to analyse M&As and also to ensure that safer conclusions can be drawn, three methods have been used to assess the impact of M&As on the cost and profit efficiency of Greek commercial banks. In addition, the existence of economies of scale and the margins which may exist in exploiting them have been looked at.

In the period 1994-1997, Greek banks showed substantial scope for improvement in their cost and profit efficiency. The margins for improvement in this area were greater for small and large banks. These margins concerned not only cost but also income. It should be noted that this period was marked by a fall in the level of concentration, and thus a rise in the level of competition in the banking market. The picture Greek banks show during the period under examination is similar to the picture for European banks, although the latter exhibited less margin for improvement in profit efficiency, profits being chiefly derived from income. By using various bank performance indicators (according to the size of the banks) and looking at their dispersion, it becomes clear that the M&As which took place in Greece up until 2000 led to an improvement in cost efficiency and, in particular, in profit efficiency for the new

banks which came into existence as a result of these M&As during the period 2000-2002. Labour productivity contributed positively to this development.

These results are also confirmed by a comparison of the banks' performance with that of the best performer. Indeed, in the period before the M&As, Greek banks as a whole suffered from relatively low cost efficiency. This was mainly due to the number of staff employed rather than to salary levels. They were also characterised by low levels of profit efficiency, reflecting both cost and labour productivity. Also, relative profit efficiency showed considerable improvement when the M&A involved small to medium-sized banks, and deterioration when they involved medium-sized to large banks. This reflects exclusively the corresponding relationship between cost and size. The M&As which took place had a positive effect on the cost and profit efficiency of the banks which resulted from them, by capitalising on the existing margins for improvement. However, it appears that scope exists for further improvement in efficiency, although the concentration of the banking system increased during the period 2000-2002.

Out of the individual cases of M&As examined (eight in total), the majority led to improved profit efficiency, while three led to improved cost efficiency. However, when the return on equity was used as the profitability indicator, an improvement in both cost and profit efficiency was recorded in only two cases of merger, and in only one case when the return on assets was used as the indicator. Note that the two cases where improvement in both cost and profit efficiency is observed involve small banks.

Regarding economies of scale, it can be seen that, before the M&As, economies of scale were found in small to medium-sized banks, with large banks experiencing negative economies of scale. The M&As which took place are estimated to have led banks which merged to exploit such economies.

The findings of this study agree substantially with similar findings from research concerning the banking sector in EU countries and the US which covers the second half of the 1990s. Indeed, if account is taken of the difference in average size between Greek and European (or American) banks, certain benefits derived from M&As in terms of cost efficiency and, mainly, profit efficiency become evident. It can also be seen that the most successful M&As involved small-scale banks. Also, it appears that an important motivation for the M&As which took place was the desire to take advantage of economies of scale.

Finally, as far as the improved profit efficiency observed in the period 2000-2002 is concerned, it is felt that the extent to which this improvement may have been influenced by the increased level of bank concentration during this period should be the subject of further research.

APPENDIX

1. Definition of indicators

The definition of the financial indicators used for this research is as follows:

–   Return on equity (ROE): the ratio of net profits before tax to average equity (%).

–   Return on assets (ROA): the ratio of net profits before tax to average assets (%).

–   Labour productivity (million drachmas/number employed): the ratio of total gross income, deflated by the consumer price index (CPI), to the number of employees.

–   Average salary at constant prices (million drachmas/number employed): the ratio of staff cost, deflated by the consumer price index (CPI), to the number of employees.

–   Productivity of capital: the ratio of total gross income to total non-labour cost.

–   Total assets productivity: the ratio of total gross income to total assets (%).

–   Profit margin: the ratio of net profits, before tax and provisions, to total cost (%).

2. Sources of statistical data

–   Balance sheets and profit and loss accounts of commercial banks, drawn up according to the Banking Sector Chart of Accounts.

–   Group of Ten (2001) for European banks and

–   NSSG (for data on GDP and the CPI).

References

In Greek

Athanasoglou, P. P. (1998) "The European banking system and the capital market: its role in the development of the European Union"), *Bulletin of the Hellenic Bank Association*, No. 15, 53-60.

Voloudakis, E. (2002), *"Bank mergers and acquisitions: A first assessment"*, Epilogi (Trends: The Greek economy in 2002).

In English

Akhavein, J. A., A. N. Berger and D. Humphrey (1997), "The effects of megamergers on efficiency and prices: Evidence from a bank profit function", *Review of Industrial Organization*, 12, 75-103.

Allen, L. and A. Rai (1996), "Operational efficiency in banking: An international comparison", *Journal of Banking and Finance*, 18, 665-72.

Altunbas, Y. and P. Molyneux (1996), "Economies of scale and scope in European banking", *Applied Financial Economics,* 6, 367-75.

Altunbas, Y., P. Molyneux and J. Thornton (1997), "Big-bank mergers in Europe: An analysis of the cost implications", *Economica*, 64, 317-29.

Berger, A.N. (1998), "The efficiency effects of bank mergers and acquisitions: A preliminary look at the 1990s data", in Y. Amihud and G. Miller (eds) *Bank Mergers and Acquisitions,* Kluwer Academic Publishers, 79-111.

Berger, A.N., R.S. Demsetz and P.E. Strahan (1999), "The consolidation of the financial services industry: Causes, consequences and implications for the future", *Journal of Banking and Finance*, 23, 135-94.

Berger, A.N. and D. Humphrey (1992), "Megamergers in banking and the use of cost efficiency as an antitrust defense", *The Antitrust Bulletin*, 37, 541-600.

Berger, A.N. and L.J. Mester (1997), "Inside the black-box: What explains differences in the efficiencies of financial institutions?" *Journal of Banking and Finance,* 21, 895-947.

Boyd, J. H. and S. L. Graham (1998), "Consolidation in US Banking: Implications for Efficiency and Risk", in Y. Amihud and G. Miller (eds) *Bank Mergers and Acquisitions,* Kluwer Academic Publishers, 113-35.

Chamberlain, S. L. (1998), "The effect of bank ownership changes on subsidiary-level earnings", in Y. Amihud and G. Miller (eds) *Bank Mergers and Acquisitions,* Kluwer Academic Publishers, 137-72.

ECB (2000), "Mergers and acquisitions involving the EU banking industry – facts and implications".

Economist (1998), "Merger mania, sobering statistics", 20 June.

Group of Ten (2001), "The effects of consolidation on efficiency, competition and credit flows", *Report on Consolidation in the Financial Sector,* Chapter V, 247-307.

Hanweck, G.A. and B. Shull (1999), "The bank merger movement: efficiency, stability and competitive policy concerns" *The Antitrust Bulletin,* 44, 251-84.

Hughes, J.P. and L.J. Mester (1998), "Bank capitalization and cost: Evidence of scale economies in risk management and signaling", *Review of Economics and Statistics*, 80, 314-25.

Huizinga, H.P., J.H.M. Nelissen and R.V. Vennet (2001), "Efficiency effects of bank mergers and acquisitions in Europe", Tinbergen Institute Discussion Paper No. 88.

Huizinga, H. (2003), "EMU and financial market structure", in M. Buti and A. Sapir (eds) *EMU and Economic Policy in Europe,* Edward Elgar, 303-33.

Kwan, S.H. and J.A. Wilcox (1999), "Hidden cost reductions in bank mergers: Accounting for more productive banks", Federal Reserve Bank of San Francisco, Working Papers in Applied Economic Theory, No. 10.

Linder, J. C. and D.B. Crane (1992), "Bank mergers: Integration and profitability", *Journal of Financial Services Research, 7,* 35-55.

Pilloff, S.J. and A.M. Santomero (1998), "The value effects of bank mergers and acquisitions," in Y. Amihud and G. Miller (eds) *Bank Mergers and Acquisitions*, Kluwer Academic Publishers, 59-78.

Rhoades, S.A. (1998), "The efficiency of bank mergers: An overview of case studies of nine mergers", *Journal of Banking and Finance,* 22, 273-91.

Vennet, R.V. (1996), "The effect of mergers and acquisitions on the efficiency and profitability of EC credit institutions", *Journal of Banking and Finance,* 20, 1531-58.

Vennet, R.V. (2002), "Cost and profit efficiency of financial conglomerates and universal banks in Europe", *Journal of Money, Credit, and Banking,* 34, 254-82.

Monetary system and macroeconomic policy in Greece: 1833-2003*

Sophia M. Lazaretou
Bank of Greece
Economic Research Department

1. Introduction

Ever since the time of the Renaissance, i.e. since the birth of the national civil state in today's sense, the army and the currency have been the twin pillars of each state entity. As a result, a currency is not simply one of the key pillars of the economic system but also a national symbol. An economy built on firm foundations and demonstrating a sound macroeconomic performance is sure to achieve and maintain monetary stability. Monetary stability helps goods and services markets, and above all the financial system, to function smoothly, leading ultimately to economic growth. In the past, many countries sought to tie their currency to a precious metal or peg it to the currency of the strongest economy in their geographical region (see DeCecco, 1996, Bordo and Jonung, 2000). Their willingness to join a "monetary stability club" was dictated by the need, firstly, to reduce exchange rate fluctuations in commercial transactions among themselves, secondly, to reduce credit risks and, thirdly, to ensure credibility in pursuing anti-inflationary policies (see Bordo, Edelstein and Rockoff, 1999, Flandreau and Maurel, 2001, Meissner, 2002).

This article describes the economic development

of the modern Greek state and the macroeconomic policy pursued from the perspective of monetary and fiscal developments. Greece's monetary system was, quite naturally, affected by international monetary developments. Mainly, however, it was affected by fiscal disturbances, which in turn were caused by wartime expenditures to defend the country at times of global or local armed conflict, and also by the gradual widening of the country's geographical borders and increased population following the addition of new territories and the influx of refugees from Asia Minor.

The article is organised as follows: The first part (Sections 2-6) examines fiscal and monetary developments in the period before World War I (WWI). At the time of the traditional gold standard, the Greek State suffered from a weak fiscal system and monetary isolation. It was not until 1910 that Greece first pursued consistently a gold standard policy, just four years before the international gold standard collapsed. The second part (Section 7) deals with the inter-war period, a time of transformation for Greek society and its economy. Following international practice, Greece set up an independent central bank and pegged its currency to sterling, a gold-based currency. The third part (Section 8) looks at the collapse of the real and monetary sectors of the Greek economy during the Occupation period in World War II (WWII) and at efforts made towards the monetary restructuring of the country. The fourth part (Section 9) analyses Greece's miracle growth during the Bretton Woods period. The fifth part (Section 10) examines the policy on the sliding depreciation of the drachma and the halt in the growth of the economy after 1974, while the final part (Section 11) deals with the path towards EMU.[1]

2. The New State and its legal tender

In 1827, when Ioannis Kapodistrias was elected first Governor of the Greek State,[2] financial transactions were mainly carried out using Turkish and foreign currency such as the Spanish *distilo*. There was no Greek currency until 1829. At the same time, the international monetary system was based on the bimetallic system of France. The French monetary authorities were ready to exchange gold for silver at a rate of 15.5 parts of silver to 1 part of gold. There was no limit to the amount that could be exchanged, as they held large reserves in both metals. Thus, this rate became the international rate, simultaneously stabilising the relative prices of gold and silver and the parities of all currencies that were either on a gold or on a silver standard. In Europe, Great Britain alone had maintained a *de jure* gold standard since 1821, when the Bank of England had been obliged by law to redeem banknotes for gold coins, and a *de facto* gold standard since 1717, when the Royal Mint set the price of silver at a much lower level than its international market price, resulting in the withdrawal of silver coins from circulation. By contrast, the United States maintained a silver standard, and the US Mint valued silver at a higher rate (15 to 1) compared with its international rate.

In Greece, a national monetary system was

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1 During the Lisbon Summit in June 2000, ECOFIN decided on Greece's acceptance as a member of the euro area as of 1st January 2001. In January 2002, euro notes and coins began to circulate, replacing the national currencies in the euro area.
2 The Greek State included the Peloponnese, Mainland Greece, the Cyclades, Euboea and the Sporades Islands, with a total of some 800,000 inhabitants. It was recognised as an independent state by the London Protocol of 1830.

established for the first time in 1829 and was based on silver. The monetary unit was the *phoenix*, the first Greek currency.[3] However, just two years later the government was forced to suspend convertibility of the currency and issue banknotes in order to finance the increased budget deficits.

With the accession of Otto to the throne, the monetary system changed. In February 1833, bimetallism was introduced as a new monetary standard and the *drachma* as the new legal tender. As mentioned in the decree of 8th February 1833 (re: "Amendments to the monetary system"), one of the main reasons behind the monetary reform was the need to replace the underweight phoenix with the heavier drachma. The drachma was a silver coin weighing 4.029 grammes of pure silver. It was also planned to mint gold coins. The gold twenty-drachma coin (the Ottonian) weighed 5.199 grammes, i.e. 0.25994 grammes of pure gold per drachma. Therefore, the gold content of the gold drachma was 15.5 times less than the silver content of the silver drachma and, as a result, the ratio of the two metals matched the international ratio, i.e. 1:15.5

Given the limited quantity of drachmas in circulation,[4] foreign coins were allowed by law to circulate freely in order to facilitate transactions.[5] Most of these coins were damaged, with a denomination much higher than their purchasing value. The "bad" currency quickly displaced the silver drachma. Holders of foreign coins exchanged them for drachmas, which they then melted down for the precious metal. Thus, the drachma soon became the "ideal currency," which was used as an "accounting unit for foreign currencies and things of value." (Kechagias, 1875, p. 8).

3. Fiscal difficulties and funding of economic growth: the National Bank and the exclusive privilege of issuing banknotes

Until the mid-19th century, the economy of Greece was based on agriculture, a sector which had been strengthened after the confiscation of Ottoman assets. The main forms of economic activity were trade, shipping and the handicrafts. Income from shipping and the resettlement in Greece of rich Greek expatriates and Philhellenes from abroad were the only sources of capital inflow. Moreover, recourse to foreign borrowing to secure funds was impossible. The inability to repay the foreign loans of 1824-25 and 1832 damaged the country's creditworthiness and for a long time deprived Greece of access to European money markets.[6]

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3 A monetary system had been proposed from mid-1828. The phoenix was introduced as the official currency one year later, in July 1829 (see Kougeas, 1992, Kokkinakis, 1999).

4 Coins made of precious metals were only minted during the first three years of Otto's reign. Only a very small number of gold coins were minted, though considerably more silver ones were produced. The foreign loan granted in 1832 was one of the factors behind the efforts to establish a national monetary system. However, the Greek State's later paucity of reserves made it impossible for it to continue minting coins made of precious metals. Due to the complete absence of silver drachmas, large numbers of coins were minted using copper almost every year to allow transactions to be carried out (see Stassinopoulos, 2000).

5 29 silver and 16 gold coins. See the decree of 8th February 1833 re: "The exchange rate of foreign currencies against the new Greek currency".

6 In 1824, the country borrowed 472 thousand pounds sterling from the London Stock Exchange, and a further loan of 1.1 million pounds sterling followed in 1825. Even though the loans were secured to continue the Struggle for Independence, the money borrowed was eventually spent on funding the civil war of 1824-1825, or was squandered abroad or embezzled by foreign speculators. See Gervinus (1863), Gennadios (1878), Andreades (1904). In 1826, repayment of the debts was suspended. In 1832, a loan of 60 million drachmas was secured, with the Great Powers standing as guarantors. The purpose of the loan was to enable Greece to introduce bimetallism. The Greek government suspended repayment of the loan in 1843.

Chart 1

Budget deficits, 1833-1936

(Government spending as a percentage of total tax revenues)
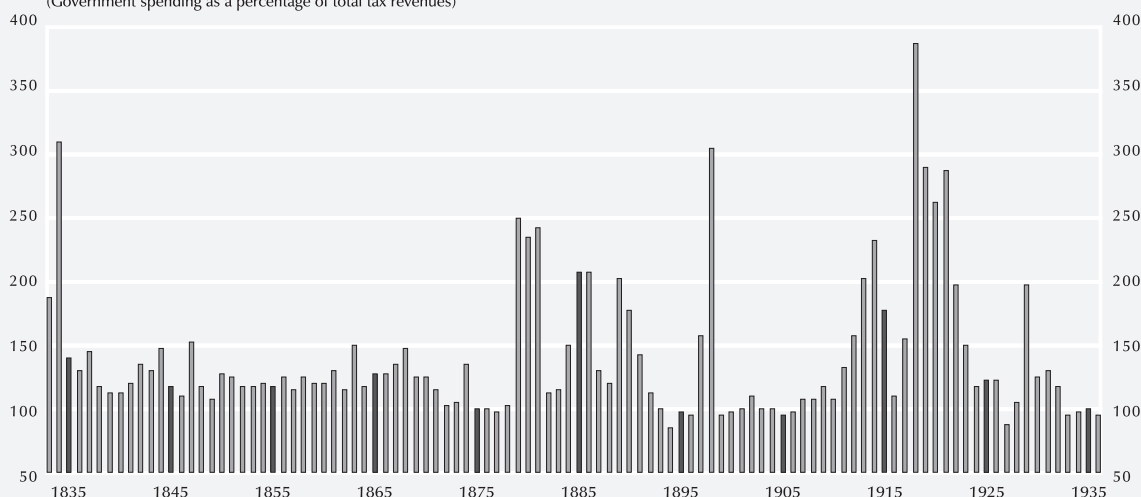
Note: Government spending concerns the expenditure of central government, including interest payments. Total tax revenues are the total revenues from direct and indirect taxation.

Source: Greek Government Budget Annual Report, 1833-1914, various issues, General Records of the Government.

The country's isolation from the European money markets and the urgent need to find funds demonstrated the necessity of a national banking institution. The new financial institution would not only help to fund the State, but also offer immediate financial assistance to restructure agriculture, trade and industry.[7] The founding of the National Bank of Greece (NBG) in 1841 was the result of protracted negotiations between Otto's government and foreign capital creditors. The operation of the bank played a decisive role in steering market interest rates. The interest rate on mortgages fell to 10%, from a minimum of 12% (which was the official rate), and a maximum of 30-40% (which was the market rate, particularly in the provinces).

The new bank was involved in two main operations, issuing and commerce. The bank had the exclusive privilege of issuing "banknotes payable

to the bearer upon request," which were fully and readily convertible into metallic coins in circulation. At the same time, it accepted private deposits in banknotes or metallic coins and provided loans to individuals and the State. It held reserves in precious metals (gold and/or silver) and interest-bearing deposits in foreign exchange with central banks abroad which were directly convertible into metal.[8] In other words, the National Bank acted as a "general banking services" institution and, *de facto*, as the central issuing bank.

The State contributed to the National Bank's equity capital and exercised control over its activ-

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7 For the role of the National Bank in monetising the Greek economy, see Thomadakis (1985).

8 For a detailed description of the operations of the National Bank, see Valaoritis (1902).

Chart 2

National Bank's loans to the Greek State, 1848 - 1939.

Note: Total liabilities of the Greek State (including interest payments and amortisation) to the National Bank in gold, foreign exchange and banknotes as a percentage of total bank assets. Before 1848, the State owed nothing to the Bank, as was also the case in 1849, 1853-55, 1857-60. When the Bank of Greece was established in 1928, the State's debt to the National Bank was reduced to less than half the original figure and the government securities were transferred to the new central bank.

Source: Alogoskoufis and Lazaretou (2002).

ities via a commissioner.[9] In exchange for the State's participation and control, the bank was granted the privilege of issuing banknotes, a particularly profitable process.

Throughout the duration of Otto's reign, very few loans were granted by the National Bank to the State, as Otto pursued a tight expenditure policy in an effort to balance the budget (see Chart 1). However, after the fall of the Bavarian dynasty at the beginning of the 1860s, the State began to become overindebted to the NBG (see Chart 2). At a time when the Greek State was unable to raise funds from international capital markets, borrowing from the National Bank was the usual practice to cover public expenditures. The government required increasingly large advances, while the National Bank charged an interest rate that was more than double the lending rates pro-

vided by the international markets, i.e. 7%-8% compared with 2.5%-4.5%. Of course, loans from the National Bank to the State were not without warranty. The bank's branches were given the role by the government of collecting various types of public revenues, and the money collected was used to service public debt.

Therefore, with an interest income rate of 7%-8% on government loans, the National Bank was in a position to pay a rate of around 3%-5% on time deposits, much higher than the international rates. The profit margin was considerable. Until

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9 The National Bank had been established as a "private limited company" (articles 1 and 28 of its statute). The State owned 1,000 shares out of a total of 5,000. However, after 1870, the State's role was limited solely to the presence in the bank of a state commissioner. Following the sell-off of its shares, the State ceased to be a shareholder in the bank.

T a b l e 1

Latin Monetary Union (LMU): special features

Year of establishment	1865
Member countries	Small number of countries with close geographical, historical and commercial links.
Aims	To establish uniform rules concerning the precious metal content of coins and to tackle fluctuations in the relative price of the two precious metals, gold/silver.
National currencies	Parallel circulation of all the national currencies for domestic transactions. The monetary authorities of each member were required to issue gold and silver coins of a purity and weight equal to a parity of 1:15.5.
French franc	Used as the nominal anchor for the other currencies of the Union. International reserve currency.
Money supply	There was neither a central monetary authority nor any agreement as to the number of notes issued by each member. Control of the money supply remained with each of the national monetary authorities.
Fiscal policy	No prudent policy was set.
Change in standard	1874-1876 and 1878. Collapse of bimetallism and transition to the gold standard. Threat of inflation due to the fall in the market price of silver. Limitations on the issue of silver currency. In 1878, the final suspension of minting silver coins was agreed.
Reason for change	Devaluation of silver. Failure to co-ordinate national monetary policies and to exercise prudent fiscal policies.
Final year of existence	*De facto:* 1914 (WWI).

the end of the 1880s, the bank enjoyed high yields from its short-term lending, around 7%-8% for discounts and 6%-9% for secured loans or credit lines. Yields on long-term loans (mortgage-backed loans or mortgage-backed credit lines) were also high, at 8%-10%. The bank offered depositors yields of around 5.5%-6% (savings deposits) and 3%-5% (time deposits). These rates were much lower than the yield on its loans, but still much higher than rates on international markets. In this way, the bank was able to attract funds both from the domestic and the foreign market.

4. The search for an international monetary refuge

In 19th century Europe, two nations were locked in a struggle for political and economic leadership: Great Britain and France. France had adopted bimetallism, and set the parity of gold and silver at 1:15.5 in 1803. This rate remained stable until the beginning of WW1. Napoleon's dominance in Europe established the French franc as an international currency in the continent and underlined the need to adopt the French bimetallic system. Even after the Napoleonic years, France was for her neighbours the main importer of their goods and their major creditor.[10]

The major discoveries of gold during the 1850s and 1860s caused its market price to fall in relation to the price of silver. One consequence of this was an inflow of gold and an outflow of silver, resulting in silver coins being hoarded. The consequent shortage of silver coins caused significant difficulties in transactions. Thus, in 1865, four

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10 The gold standard literature contains abundant historical and empirical evidence pointing to Great Britain's and sterling's dominant position at the time of the gold standard, and to the dominance of France during the Latin Monetary Union (LMU). See, e.g., Kindleberger (1993), Eichengreen (1985, 1990), Bordo and Kydland (1995) and Bordo and Rockoff (1996).

Table 2
Member-countries of the LMU

France	Founder member. In 1803, France set a fixed rate of 1:15.5 for gold to silver, laying the grounds for a stable monetary system. It consistently adhered to the convertibility rule except on two occasions, once in 1848-50 (acute social and political crisis) and once in 1870-78 (Franco-Prussian War). In 1865, France was at the forefront of efforts to establish the LMU. In 1878, it adopted the gold standard.
Italy	Founder member. In 1862, Italy adopted bimetallism even though its monetary system was de facto a gold standard one. However, in 1866, it suspended convertibility until 1884. In 1894, the country returned to a fiat money standard and did not adopt fixed exchange rates until 1927.
Belgium	Founder member. Belgium adopted bimetallism in 1832 (except for a brief episode in 1848). In 1878, it adopted the gold standard and adhered to it until 1914.
Switzerland	Founder member. Switzerland adopted bimetallism in 1850. In 1878, it turned to the gold standard, to which it adhered until 1914.
Greece	Signed the LMU agreement in 1867. Greece did not adopt a form of gold – French franc standard – until 1910, with the exception of one unsuccessful effort to do so in 1885.

countries, France, Belgium, Italy and Switzerland, agreed to cooperate and maintain the bimetallic system. In Paris on 23rd December, they established the Latin Monetary Union (LMU).[11] The ratio of 1:15.5 was set as the official parity rate between the two metals, while the French franc became the common monetary unit (see Tables 1 and 2).

In Greece, the first improvement in the domestic economy can be dated to after the middle of the 19th century. The contribution of Greek communities abroad, one of the strongest forces in the international economy at the time, was decisive for the economic development of the country. Greek shipping and trade witnessed rapid growth.

Chart 3 shows the development over time of *per capita* income in Greece and its main components. As can be seen, despite the significant increase in the size of the population owing to the gradual territorial enlargement of the country, *per capita* income shows an upward trend in the long run, mainly as a result of an increase in GDP.

In the middle of the 1860s, Spain abandoned the monetary system based on the distilo. At that time, international trade transactions were made in currency that was directly convertible into precious metal at a fixed rate, and for this reason Greece needed to adopt an internationally accepted monetary system. Under the "Law on Currency" (April 1867), Greece signed up to the LMU agreement, accepting the principle of bimetallism and pegging the gold drachma to the gold French franc (rate 1:1). Minting the new drachmas was permitted as soon as the law came into force. The new system was set to come into operation on 1st January 1869. However, the imposition of fiat money[12] in December 1868, at a time when conflict in Crete was looming and an insufficient number of the new drachmas had been issued, forced the government to postpone the

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11 For the history of monetary unions and in particular the LMU, see Redish (1993), Flandreau (1993), DeCecco (1996), Bordo and Jonung (2000) and Fergusson (2000).

12 Fiat money, i.e. the circulation of currency (banknotes and coins) which could not be exchanged for precious metals. In other words, the central issuing bank was no longer obliged to maintain a fixed ratio of reserves to precious metals and/or a fixed ratio of gold-based foreign exchange to money in circulation.

Chart 3

Per capita GDP, 1833-1938

(In drachmas at 1914 constant prices)

GDP and population, 1833-1938

Million drachmas

Million inhabitants

GDP at 1914 constant prices (LHS)

Population (RHS)
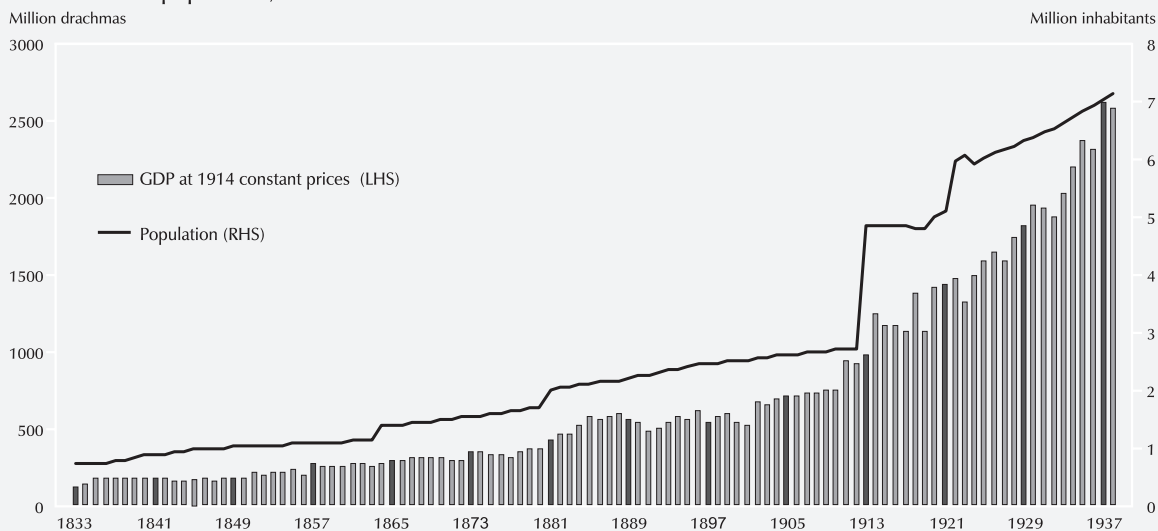
Source: The data for GDP and *per capita* GDP are taken from Kostelenos and Petmezas (2002).

implementation of the new system. Convertibility was restored in 1870 once hostilities had ceased. However, the delay in preparing for the adoption of the new system, together with further armed conflicts, forced the Greek monetary authorities to suspend convertibility of the drachma perma-nently.[13] In the meantime, international monetary conditions changed, with the collapse of bimet-allism and the adoption of the gold standard by all LMU countries.

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13 For an analysis of the historical events concerning the enforce-ment and suspension of the metallic convertibility of the drachma, see Lazaretou (1993, 1996) and Dritsas (1999).

5. Fiscal inadequacy and monetary isolation

Systematic attempts to industrialise the country can be dated to the last quarter of the 19th century. The economic policy of the Trikoupis governments placed emphasis on the development of the private sector and the introduction of new technology into the production process, with parallel attempts to free the economy from stifling state control. It was at this time that the first efforts were made to create infrastructure, with roads being built, ports renovated, Lake Kopaida drained and filled in, the Lavrio mines brought into operation, the Corinth Canal constructed and the railway network developed. These projects helped both to modernise the country and to restructure the economy of the new regions of Thessaly and parts of Epirus, which had been transferred to the Greek State in 1881. Increased agricultural production, chiefly involving exportable goods, the introduction of industry and the rapid growth of credit and banks were the main features of the period. Improved public transport, increased population, borrowing from the National Bank and abroad (after 1879) and economic euphoria in Western Europe were all determinant factors of the growth of the domestic economy.

Chart 4 depicts output fluctuations (GDP) as a result of both temporary and permanent "disturbances". The long-term trend in the output growth reflects the permanent "disturbances" associated, among other things, with technological advances. The cyclical component reflects temporary "disturbances" stemming from the total demand side. As is evident in the chart, the upward trend in output intensified during the

1880s and the first decade of the twentieth century, a reflection of the benefits accruing from the technological advances which marked this period (railways, infrastructure works).

Despite large-scale public spending, governments did not make any parallel efforts to reform the budgets. Prior to WWI, taxes were imposed on income from agriculture, building work, property and profits from trade. Income from employment was not taxed, nor was taxation imposed on personal income. Citizens were taxed on the basis of objective criteria set by the government, and not on the basis of their ability to pay taxes. The first systematic attempt to reform the tax system was made in 1919 with the introduction of tax on personal income. The lack of a uniform tax system for all regions of the country, together with the low tax rates, made the cost of collecting taxes high and led to a loss of revenues.[14]

The successful composition of 1878 concerning the foreign loans of 1824-1825 rebuilt Greece's creditworthiness. As a result, Greek government bonds once again became negotiable on the London Stock Exchange, and gold began to flow into Greece (see Chart 5).[15] However, only a small part of the money borrowed was eventually used to fund production. Most of the money was used

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[14] For a detailed description of the tax system, see Angelopoulos (1933) and Andreades (1916).

[15] Until the final composition of 1878-79 with foreign creditors, international money markets in London and Paris were closed to Greece. To cover its emergency borrowing requirements, the Greek State used the National Bank's credit facilities. The latter offered short-term advances with high insurance premiums to offset the risk. As a result, the bank's interest rate on the loans was between one and two percentage points higher than the international interest rate.

Chart 4

Output fluctuations due to permanent and temporary disturbances, 1833-1938

(GDP at 1914 constant prices)

A. Long-term trend

Hodrick-Prescott trend

B. Cyclical component
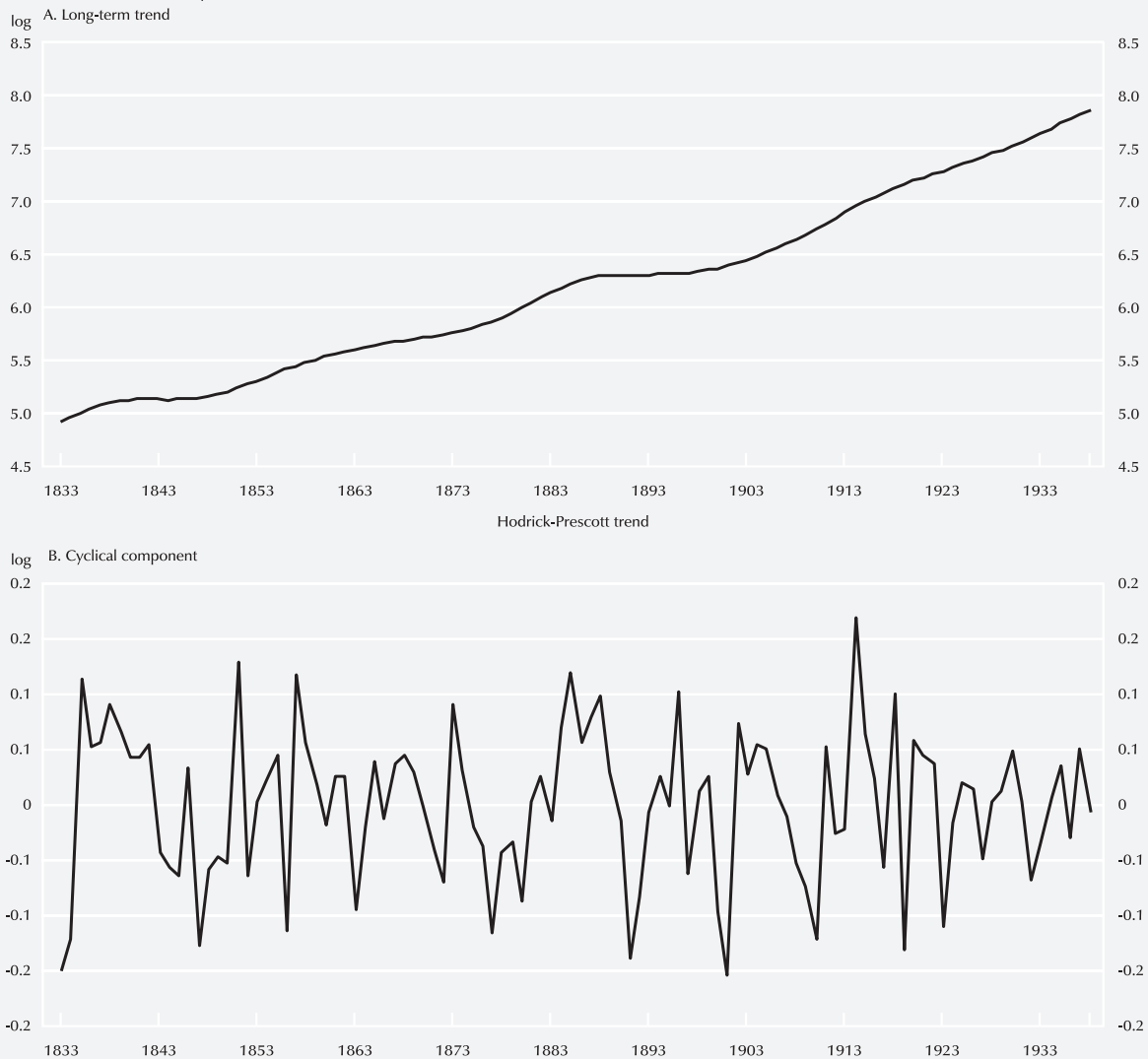
Source: Author's calculations.

to cover the State's budget deficit and to pay off the accumulated domestic debt.

In order for the country to participate in the LMU from January 1885, it was essential to increase the National Bank's metal reserves, to carry out the currency reform of 1882[16] and to reduce fiscal deficits. However, the failure to control fiscal

deficits owing to the high cost of servicing debts and the economic crisis which had started as a

[16] To achieve a rate of 1:1 between the drachma and the French franc, the new drachma was designated as a currency unit. The exchange rate of the new drachma to the old one was the equivalent of 0.89 new drachmas for the debts owed by the State and the private sector, and 0.90 for taxes, pensions, salaries and remittances. However, the rate was 1:1 for everyday retail trade transactions, which led to a rise in the price of basic goods.

Chart 5
Total reserves, 1842-1927
(Million drachmas, end of year)

□ Metallic
■ Foreign exchange

Note: Money credits guaranteed by Entente are not included.

Source: National Bank of Greece, *Annual Report of the Governor*, 1843-1928 (various issues), Historical Records of the NBG.
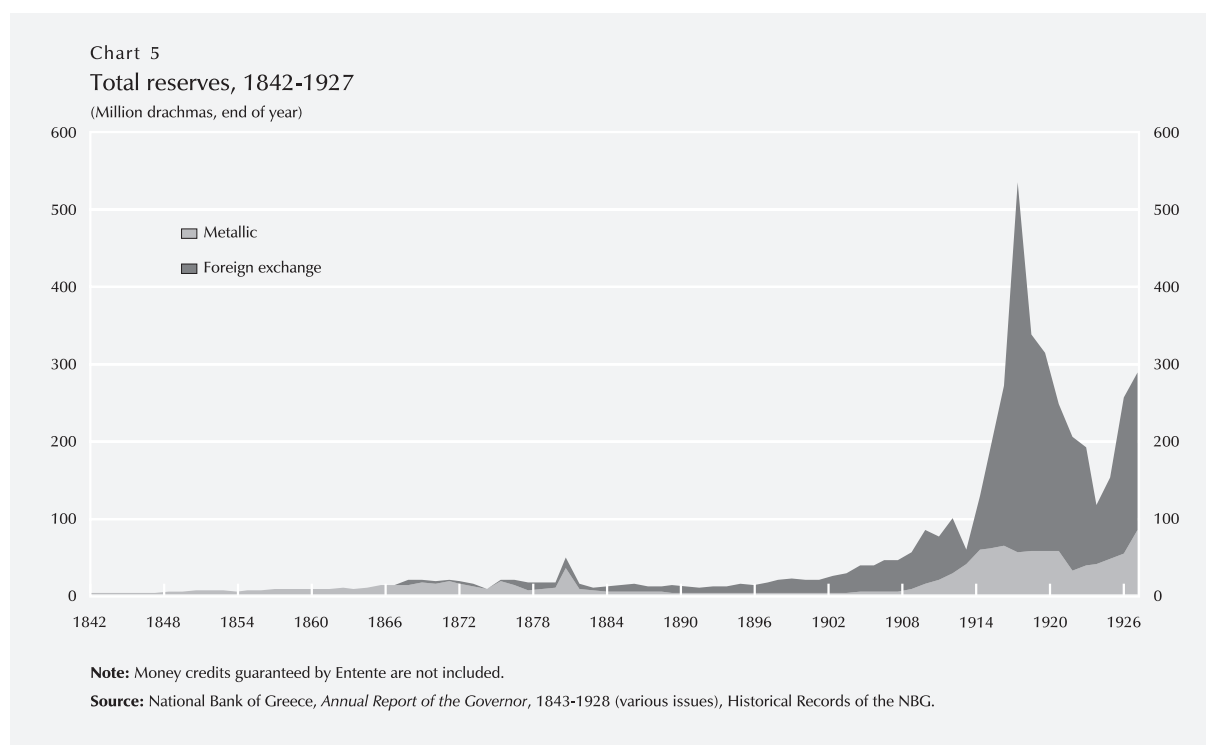
commercial crisis at the end of 1884 threatened the viability of maintaining fixed exchange rates. Thus, Greece's participation as a full member of the LMU lasted just nine months and ended in failure.

6. From State bankruptcy to monetary stability

Following the end of the 1884-85 economic crisis and Greece's successful negotiation of a large foreign loan in 1887, the country's creditworthiness on international money markets improved. From 1889 onwards, foreign creditors willingly provided long-term loans to the Greek government with small or no guarantees and at a low interest rate. Nevertheless, the cost of servicing domestic public debt together with the high level of primary expenditures, much of which was paid for by foreign borrowing and was therefore a burden on the

budget in the coming years, perpetuated fiscal deficits. As a result, the country for a long period maintained a fiat money system.[17]

Chart 6 shows the path over time of banknote circulation and its two main components: the government's floating debt to the National Bank and banknote circulation outside the financial system. It should be noted that after 1886 there was an increase in the government's floating debt, indicating the use of inflation as a financing instrument of public borrowing requirements. Chart 7 plots the standard deviation of the monthly changes in the National Bank's total reserves and total banknotes in circulation. It is worth noting

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17 For the incompatibility of financing budget deficits via inflation and maintaining fixed exchange rates, see Barro (1987), Grilli (1989), Bordo and White (1991) and Giovannini (1993). For the Greek case, see Lazaretou (1995a) and Alogoskoufis and Lazaretou (2002).

Chart 6

Banknote circulation, 1877-1909

(Million drachmas, end of year)
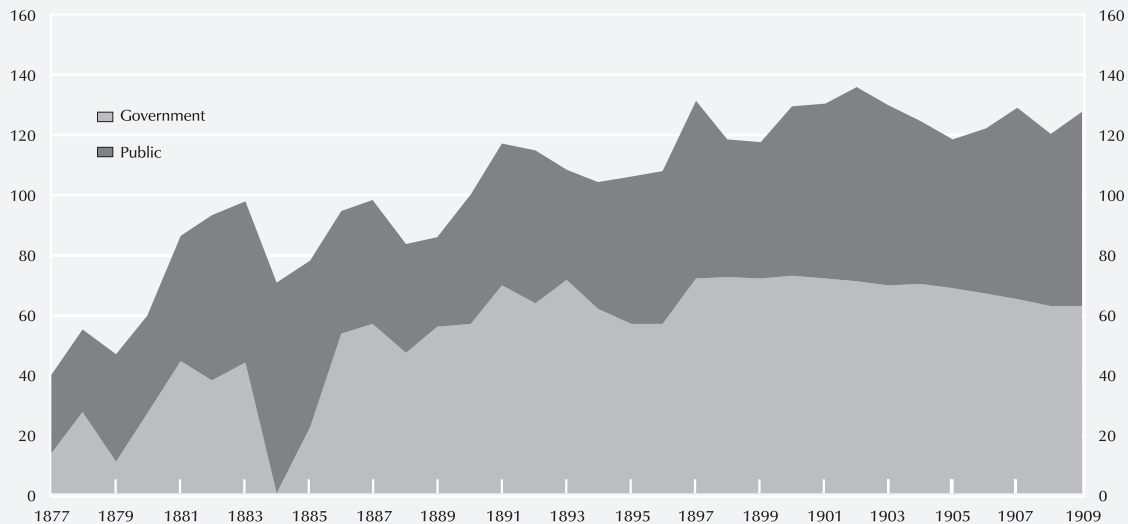
Note: The chart depicts the government's floating debt to the National Bank ("Government") and the "uncovered" banknote circulation ("uncovered" by precious metal or gold-based foreign exchange) outside the banking sector ("Public").

Source: National Bank of Greece, *Annual Report of the Governor*, 1843-1928 (various issues), Historical Records of the NBG.

that, in periods of currency inconvertibility,[18] divergent increases in banknote circulation were accompanied by divergent falls in reserves.

In 1890, the country's creditworthiness began to suffer. The impending bankruptcy of Portugal in Europe and Argentina in South America, combined with the American dollar crisis, unnerved foreign creditors, who had previously been granting generous unsecured loans to developing countries at low interest rates. In December 1893, the Trikoupis government unilaterally suspended the repayment of foreign loans. Negotiations with foreign lenders provided for the permanent presence of foreign experts in Greece to monitor economic policy and tax collection and management systems. Following defeat in the war between Greece and Turkey in 1897, Greece was obliged to accept the presence of the International

Committee for Greek Debt Management in February 1898. This marked the start of a decade of fiscal consolidation and monetary austerity.

However, the prudent regime imposed by the International Committee proved to be short-lived. The policy of setting strict limits on the issue of fiat money was based on the assessment that there was a "currency plethora" which needed to be restrained.[19] The inflexibility thus imposed on banknote circulation soon led to an excessive money demand. At the same time, the rapid decline in inflation caused strong revaluation pressures on the drachma, which had negative repercussions on the international competitiveness of the Greek

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18 1869-70, 1877-84, 1886-1909 (1886-97 inflationary period, 1898-1909 disinflation period), 1919-27.
19 See Simantiras (1905), Katselidis (1902).

Chart 7
Volatility of banknote circulation and total reserves, 1850-1928

Note: Standard deviation of monthly percentage changes in banknote circulation and total reserves.

Source: Author's calculations.
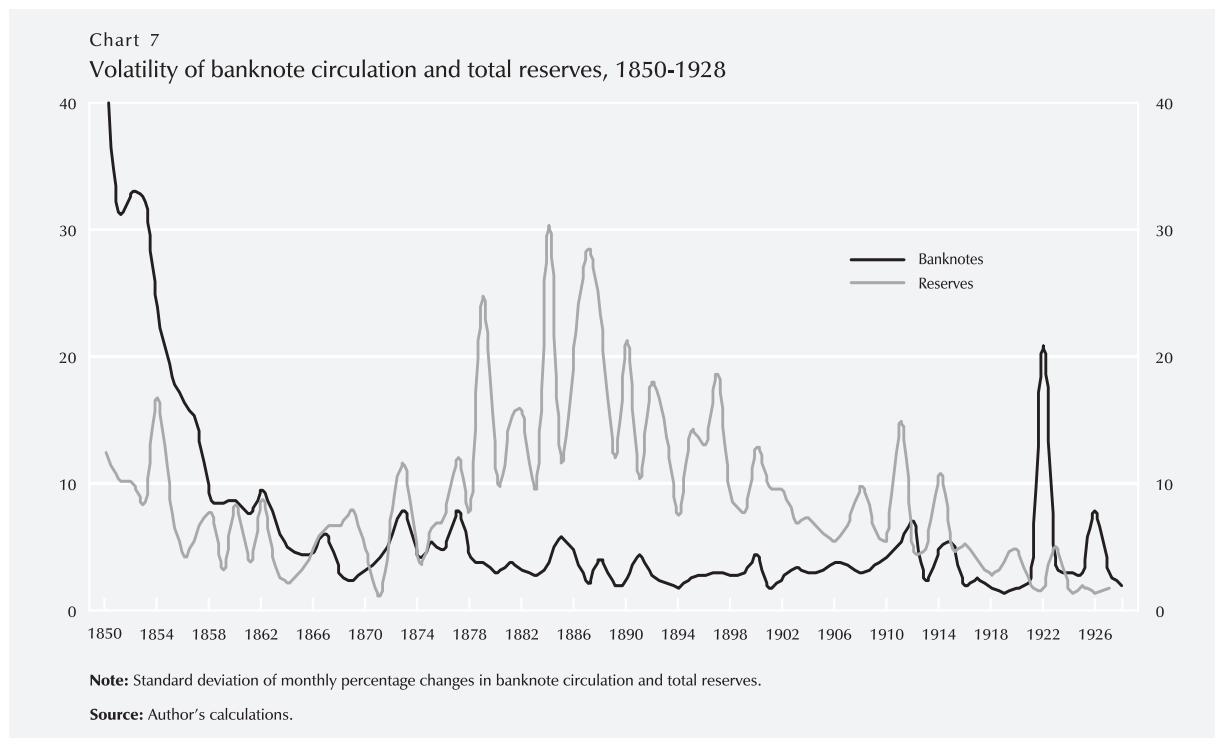
economy (see Chart 8).[20] The rise in the drachma was particularly pronounced during the months when agricultural produce was being exported. The currency appreciation was made greater by the inflow of gold, owing to the sharp rise in invisible transfers during this period.[21] The threat of a credit squeeze was now apparent. The upward march of lending rates during the first decade of the 20th century is an indication of excess demand rather than of excess money supply. In particular, the National Bank's discount rate varied between 5.5% and 7%, just one percentage point lower than the corresponding rate during the period of high inflation. Other commercial banks' interest rates were much higher (8%-10%). The National Bank's interest rate on mortgage-backed loans was 7% in the Athens area, and still higher away from the capital.

In order to avert inflationary pressures on the drachma and to keep its exchange rate fixed at its

par value, the National Bank was given a legal right[22] to exchange drachmas for French francs or gold without limit at the official parity of 1:1 (Valaoritis, 1911). More specifically, the National Bank could purchase gold at par value and foreign exchange at the rate of 1.005 drs./French franc, and sell gold at the rate of 1.001 drs./French franc and foreign exchange at the rate of 1.0055 drs./French franc. The gold points, which determined the fluctuation limits for the exchange rate

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20 In 1903, the drachma exchange rate against the French franc rose by 4% within a year. In 1906, the annual rate of revaluation exceeded 11%. For a presentation of the monetary crisis and how it was dealt with, see Demathas, Kalafatis and Sakellaropoulos (1991). See also Tragakis (2001).

21 The first great wave of emigration to America occurred at the end of the 1890s. The number of Greeks who left the country to live abroad rose dramatically in the first decade of the 20th century.

22 Law 3642 of 19th March 1910. For a more detailed description of the law, see Damiris (1920), Farmakidis (1921) and Bank of Greece (1978). For a critical analysis of how the law operated, see Alogokoufis and Lazaretou (2002, ch. 5).

Chart 8
Nominal and real exchange rate of the drachma against sterling, 1887-1914
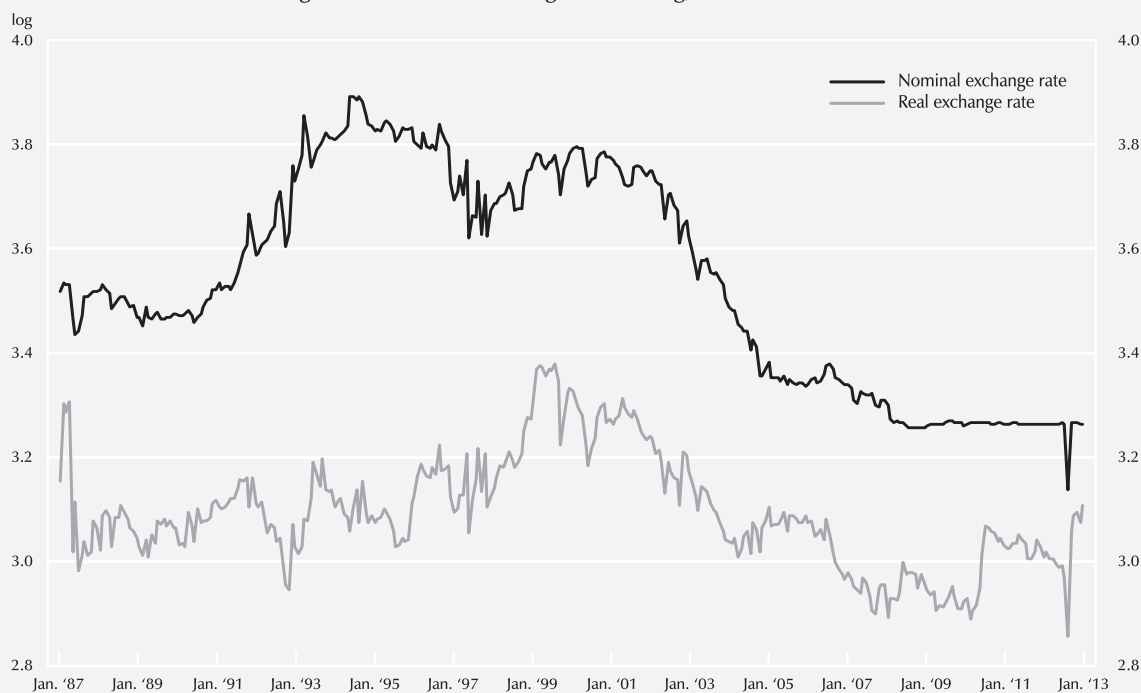
Note: Monthly averages (spot rates). The real exchange rate has been calculated as the ratio of British wholesale prices (Sauerbeck index) to prices for basic foodstuffs in Greece, using the bilateral nominal exchange rate as the conversion ratio. The food price index (1866-77=100) has been constructed as a simple geometric average of the prices of five food commodities. The data for the Sauerbeck index have been taken from the *Journal of Royal Statistical Society* and Grilli and Kaminsky (1991).

Source: Lazaretou (1995b).

of the currency and were determined by the cost of transferring gold from country to country, were set at ±0.005 drachmas. This measure made it possible to build up gold reserves, to curb any trend towards revaluation of the currency above its par value and to limit deflationary pressures on the domestic economy. The monetary reform of 1910 led the country into the LMU and established a form of French franc-gold standard.

In the years leading up to WWI, the Greek economy witnessed very rapid growth (see Chart 4). Domestic production and export trade rose substantially and the shipping industry, which expanded its activities into transit trade for third party countries, also made advances. The gradual restoration of public confidence in the currency led to a remarkable inflow of private capital, considerably enhanced by remittances from Greek emigrants abroad, shipping profits and increased exports. Greater economic activity brought with it an increase in the number of financial transactions and led to the establishment of powerful new credit institutions. The banking system was marked primarily by intense oligopoly and the lack of specialised banking organisations.[23] The country's reputation as a borrower improved consider-

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23 For a description of the banking system, see Kyrkilitsis (1934), Pepelasis-Minoglou (1998) and Christodoulakis (2002).

Chart 9

Nominal and real exchange rate of the drachma against sterling,1915-1931

Note: Monthly averages (spot rates). The same definition has been used as in Chart 8. The only difference is that instead of using food prices, the wholesale price index has been used.

Source: Lazaretou (1995b).
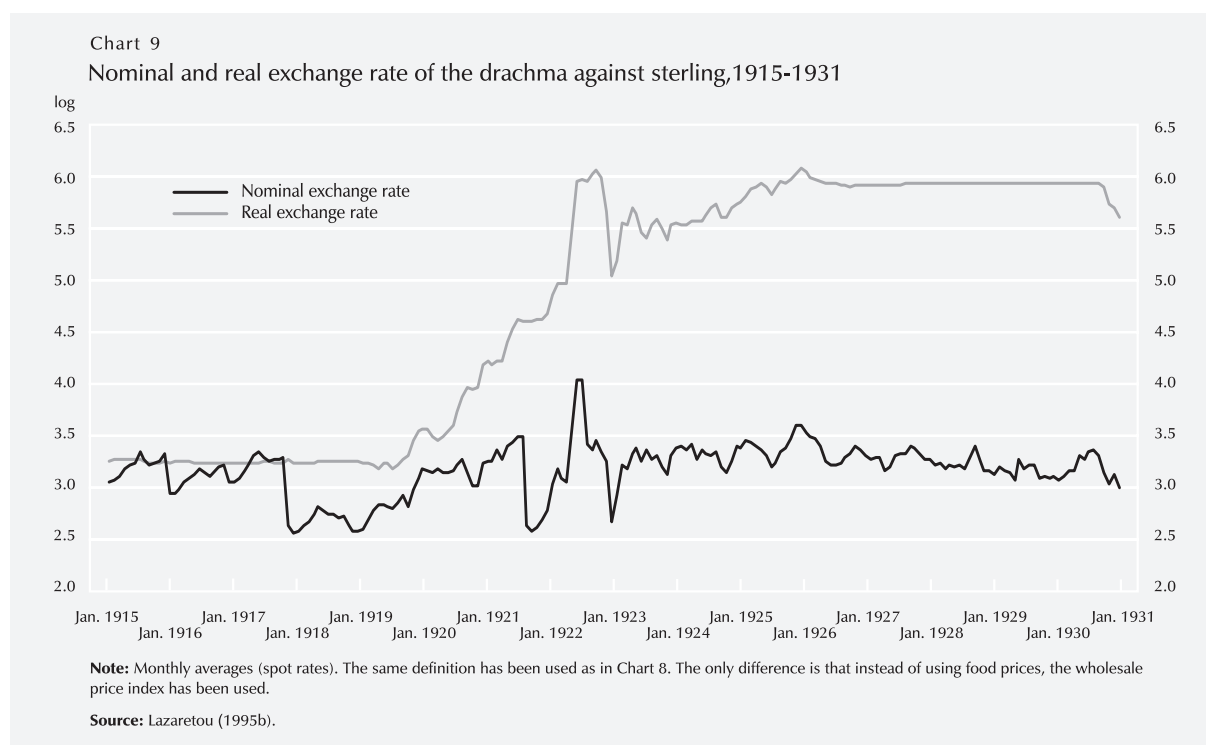
ably, resulting not only in the inflow of low-interest foreign loans, but also in the trading of government bonds on the Greek money market. One sign of the country's greater solvency was the success of efforts to secure foreign loans in wartime, which were used to cover military expenditures incurred as a result of the Balkan Wars.[24]

However, the drachma's "golden era" only lasted from 1910 to 1914, although Greece did maintain a fixed exchange rate until the end of the decade. The outbreak of WWI brought an abrupt end to peace in Europe. The traditional gold standard collapsed after approximately forty years of successful operation. In the summer of 1914, France, Germany, Russia and Austro-Hungary suspended their currencies' convertibility into gold and imposed controls on gold exports. High wartime expenditures made money creation unavoidable as a means of financing. As a result, every

European government, either *de facto or de jure*, went on to abolish convertibility and allowed the issue of paper money. The world economy entered a phase of intense monetary and exchange rate crisis and general commercial mistrust which lasted until the end of WWII.

Greece adopted a temporarily neutral position until siding with the Entente Powers in June 1917. During the period of neutrality, an inflow of foreign exchange, chiefly from shipping and remittances from Greek emigrants in America, allowed exchange rates to remain fixed at a time of war. Thus, in 1915, the drachma abandoned the undervalued French franc and was pegged firstly to sterling and later to the dollar. After 1914, as Chart 9

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24 For historical and empirical evidence of the benefits enjoyed by Greece in terms of price and exchange rate stability and long-term foreign borrowing under a fixed-rate regime, see Lazaretou (1995b, 1998, 1999).

Chart 10

Currency circulation, 1910-1927

(Million drachmas, end of year)
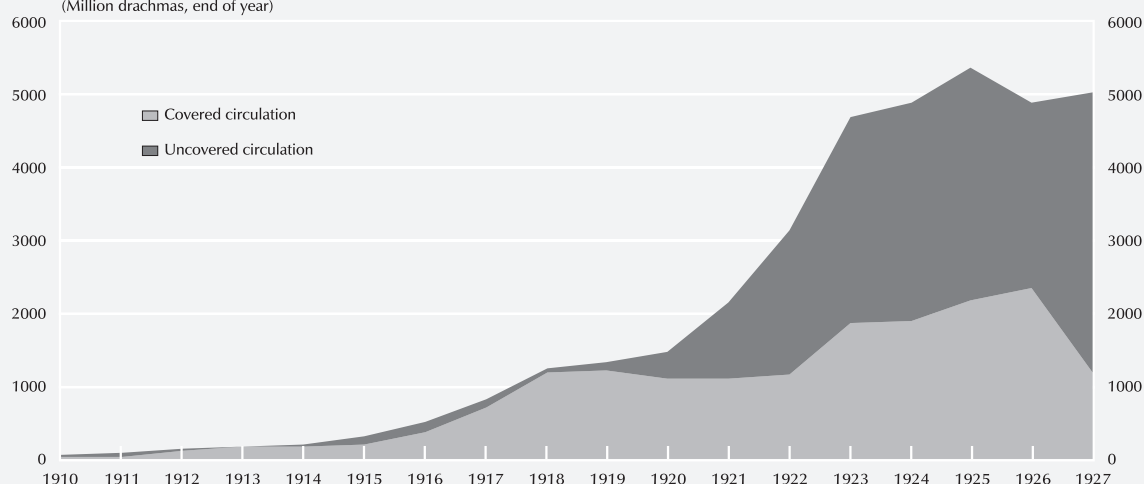
Note: The chart depicts the "covered" banknote circulation (backed by precious metal or gold-based foreign exchange) and uncovered banknote circulation (paper money) outside the banking sector.

Source: National Bank of Greece, *Annual Report of the Governor,* 1843-1928 (various issues), Historical Records of the NBG.

shows, wartime monetary expansion did not put any pressure on the drachma's nominal exchange rate, chiefly because all belligerent countries had imposed controls on gold outflows. However, when Greece itself entered the war, the high cost of military operations the country incurred during the period from 1917 to 1919 obliged the government to raise revenues exclusively by borrowing from the NBG. The bank simply rolled the printing press. This new money was not, however, backed by foreign exchange (see Chart 10). In August 1919, after the step fall in the level of foreign exchange reserves, the Greek monetary authorities again reverted to floating rates.

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7. The need to assign the issuing privilege to an autonomous central bank

During WWI, all belligerent countries suffered persistent inflationary pressures, which continued after the end of the war. Monetary instability and the extreme volatility of exchange rates in the post-war period led to attempts to coordinate economic policy among different countries and to restore the gold standard. In practice, the interwar gold-exchange standard began to operate in April 1925, when Britain returned to the gold standard. The system collapsed in 1931 with the devaluation of sterling and the withdrawal of Britain owing to the fallout of the Great Stock Market Crash of 1929.

The course of the Greek economy was once again determined by wartime emergencies and important territorial and demographic changes. Ten years of war adventures (WWI, Asia Minor Campaign) brought about serious economic and political disruption.

The 1920s were marked by the restructuring of Greece's society and economy. Large infrastruc-

ture projects were completed to increase agricultural productivity, commerce increased tenfold and industry grew quickly. High import tariffs and the cheap supply of abundant labour following the massive influx of refugees, together with a huge drop in real wages because of high inflation, were all determinant factors in the development process. As Chart 3 shows, *per capita* income, which had fallen during the war years, began to increase again, reflecting the rapid rise in GDP.

The 1920s were, however, a time of intense inflationary pressures and large fluctuations in the drachma exchange rate. Chart 9 plots the nominal and the real exchange rate of the drachma against sterling. The increased volatility of the nominal rate of the drachma in the period leading up to 1923 was mirrored in the real exchange rate volatility. Chart 11 shows the inflationary process. During the war, the consumer price index showed a strong upward trend, which became more powerful at the beginning of 1920. The average annual inflation rate from 1914 to 1919 was 25%. When measured as the first differences of the logarithms of the consumer price index, inflation reached 22.5% in 1915, 33.3% in 1916, 45.2% in 1917 and 37.3% in 1918. After a fall in inflationary pressures in 1919 (–13.2%) and their subsequent resurgence in the following two years (13.3% and 6.2% in 1920 and 1921 respectively), inflation rose sharply to 66.4% in 1922 and 45.3% in 1923. Between 1924 and 1926, prices continued to rise, although the rate of increase slowed. In 1924, inflation dropped to 8.5%. The average annual inflation rate in the period 1920-27 stood at 22.2%.[25]

In 1927, a two-year stabilisation programme

came into operation. Its main features were the devaluation of the drachma and the adoption of a policy of monetary austerity and fiscal consolidation (Tsouderos, 1928, Varvaressos, 1928, and Zolotas, 1929). The programme was the most important element behind the achievement of monetary stability. In 1927, inflation was 7.4%, while in the next two years it stabilised at a level of around 1%. The downward trend in prices at the end of the 1920s was reversed in 1932, with prices moving upwards and inflation averaging 4.2% for the year.

Efforts to stabilise the situation were assisted by a loan which the country negotiated with the League of Nations acting as an intermediary. Prerequisites for the loan were the founding of an independent central bank and the restoration of the drachma's convertibility (see League of Nations, 1927a, 1927b). The trend towards restructuring the operations of central issuing banks was a dominant one within the international movement to reestablish the gold standard. The existence in each country of a central issuing bank, free from state intervention, whose duty was to be the "banks' bank" and "lender of last resort" for the banking system, was considered to be a safeguard for the protection of monetary stability and the smooth movement of capital inter-

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25 Typical of the fiscal and monetary crisis in the 1920s was the fact that the government took desperate measures to pay for its urgent requirements. In March 1922, the government agreed on its first "forced loan." The public were instructed to cut their banknotes in half. One half of the note was exchanged for a new note with half the face value of the original, and the second half was exchanged for Treasury bills. By implementing this measure, the government hoped to be able to cover its expenses without increasing further the stock of money in the economy. In January 1926, a second "forced loan" was issued: 75% of the value of the banknotes continued to be legal tender and 25% was exchanged for Treasury bills.

Chart 11

Price level and inflation in Greece, 1914-1939
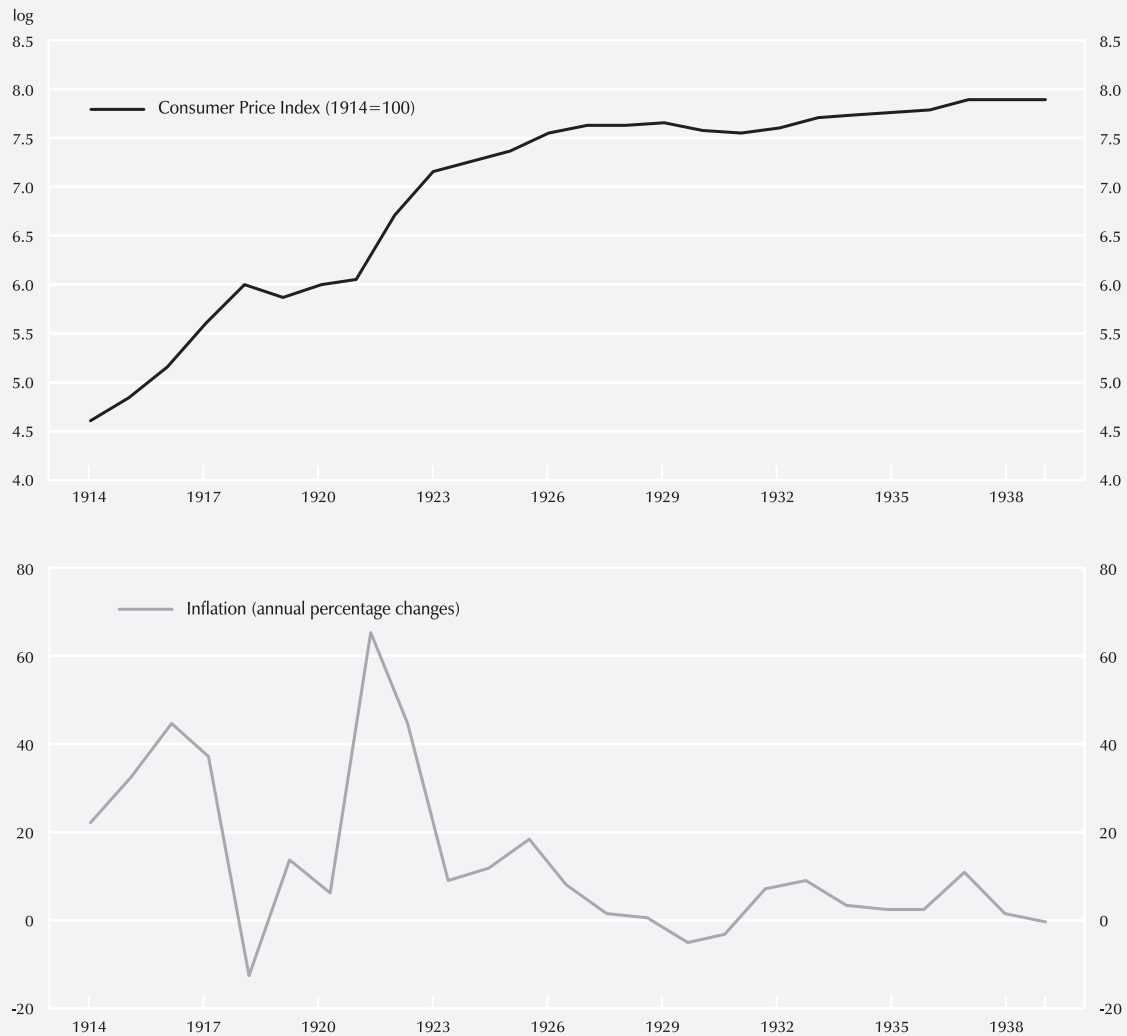
Sources: NSSG and Bank of Greece.

nationally.[26] According to the central banking orthodoxy at the time, an independent banking institution named "The Bank of Greece" was established, with the issuing department of the National Bank splitting away and the remainder of the bank becoming a fully commercial credit institution.

Greece returned to the gold standard on 14th

May 1928, the day that the Bank of Greece began to operate and the *de jure* stabilisation of

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26 For the necessity of central banks and their history, see Goodhart (1988). For a presentation of the structure of the Greek banking system between the wars and the need to reform it, see Alogoskoufis and Lazaretou (2002, Ch. 7). For efforts to establish the Bank of Greece, see Venezis (1955).

the drachma was achieved. Unlike 1910, the link-up with sterling was not part of an effort to achieve an ideal exchange rate. It took place, rather, to ensure the *de jure* stabilisation of the drachma at a level which was close to its market exchange rate (375 drachmas, ±2.5 drachmas). In this way, the deflationary disturbances of the first decade of the century were averted. The sole functions of the new bank were to ensure the full and free convertibility of its banknotes into gold-based foreign exchange at the officially determined exchange rate, to determine the lowest permitted level for the circulation of currency which could be converted into gold-based foreign exchange and to limit fiscal deficit financing.

The crisis in international monetary institutions in September 1931 provoked serious monetary turbulence in the country, resulting in Greece's leaving the gold-exchange standard seven months later. However, the government's insistence on maintaining fixed exchange rates brought Greece in June 1933 into a group of countries which had retained a close link with gold (Gold Bloc). The country stuck firmly with gold until September 1936, when the drachma joined the "Sterling Area."

With the imposition of the dictatorship on 4th August 1936, strict exchange controls were introduced. The bilateral commercial clearing system was also introduced, which —in the atmosphere of protectionism prevailing worldwide in the 1930s— sparked an increase in trade. Up until the final days before the outbreak of WWII, the drachma remained fixed against sterling with only minor fluctuations, largely owing to the exchange controls prevailing internationally.

8. WWII, Occupation and efforts towards monetary reconstruction

At the time of its entry into the war, Greece had succeeded in consolidating its domestic fiscal and monetary system. Additionally, increased military expenditures were covered by financial assistance from Great Britain, which took the form of credit facilities the Greek government could draw on immediately and use as a "cover" to issue new money. In this way, fiscal disturbances due to emergency war spending did not undermine the country's monetary and exchange stability. However, when the Occupation began, this all changed completely. The Greek economy collapsed, the country lost most of its productive capacity and its currency ceased to function as money.

The economy's fixed capital, both in the primary and secondary sectors and in the transport sector, was almost entirely eliminated either by the hostilities or on the orders of the Occupiers. The loss, however, in human terms was also enormous, as 7% of the population perished. The destruction of the country's productive capacity caused a substantial drop in the national income. In 1941 the national income, at 1939 prices, was just 1/3 of what it had been in 1939.[27]

The economic policy pursued by the Occupiers was equally catastrophic. It was based on the principal of locally acquiring all the materials necessary to supply the Occupying Forces. In addition,

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[27] For a detailed description of the catastrophic consequences of the German Occupation, see UNNRA (1946, 1947) and Bank of Greece (1947).

Chart 12

Inflation in Greece, 1939-1948
(Monthly percentage changes)

——— Pre-stabilisation (left-hand scale)
——— Post-stabilisation (right-hand scale)
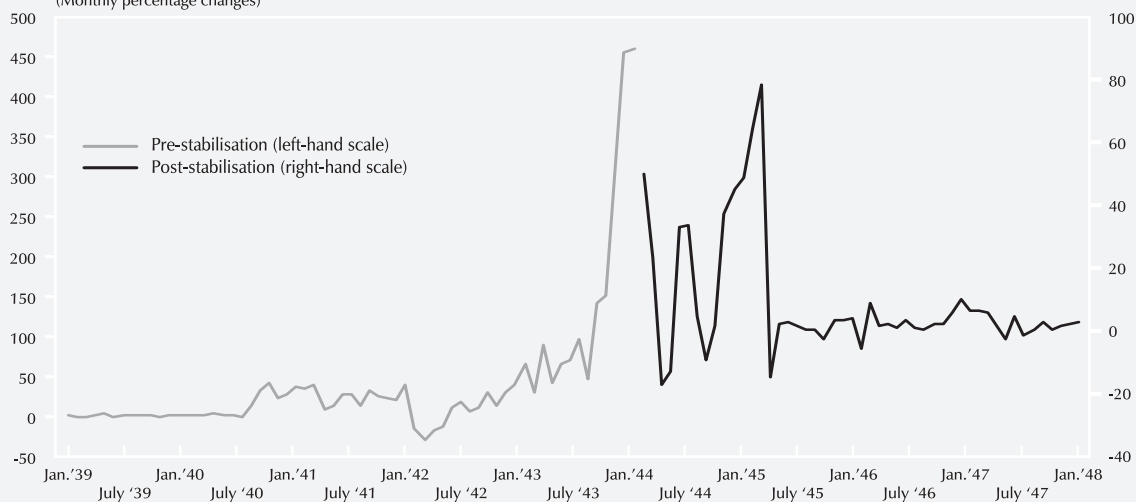
Note: Cost of living index for Athens (1938-39=100).

Source: Alogoskoufis and Lazaretou (2002).

the Occupiers forced Greece to make an excessively high contribution towards funding military operations which were spreading throughout Southeast Europe. Simultaneously, they took complete control of the Bank of Greece[28] and proceeded with a policy of uncontrolled mass-production of paper money, thus financing their war efforts by using inflation.

National production either went to satisfy the needs of the enemy's troops stationed in Greece or was exported to countries which formed the Axis Powers. The exports included basic foodstuffs required by the local population, while imports consisted of commodities needed to satisfy the needs of the occupying forces. All this resulted in acute problems in feeding the Greek population. The Greek market faced stifling product shortages, contributing to an explosion of inflationary expectations and the emergence of hyperinflation at the end of the Occupation (see Chart 12).[29]

As the population had absolutely no confidence in the future purchasing power of drachma notes, it turned *en masse* to hoarding the British gold pound ("gold pull"), which took the place of paper notes. While the drachma continued to be "legal tender," no one wished to hang on to drachmas due to their rapid loss of value. Gold was the main means of exchange and a store of wealth, not only during the Occupation but also in the early post-war period.

The Occupation resulted in the monetary and fiscal collapse of the country. By October 1944, the final month of the Occupation, the price of the British gold pound had risen by a factor of 1.6 bil-

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28 The legally-appointed administration of the Bank of Greece had, together with the King and the Prime Minister, fled to London to coordinate the continuing war effort in the Middle East, after first transferring the gold reserves to South Africa for safekeeping.
29 For the Greek hyperinflation period, see Makinen (1986) and Alogoskoufis and Lazaretou (2002, Chap. 8).

lion in comparison with its price in April 1941, the cost of living index had risen by a factor of 2.3 billion and banknote circulation by a factor of 8.3 million. Inflation was soaring, while monetary and political uncertainty hindered any upturn in economic activity. Public revenues were minimal and the tax collection system almost non-existent. Public spending remained at very high levels owing to increased spending on unemployment benefit. Spending was paid for entirely by printing new money, which further increased inflationary pressures and resulted in the complete loss of public confidence in the currency.

At the beginning of November 1944, as part of a currency reform plan,[30] the new drachma was introduced, equivalent to 50 billion old drachmas, in an attempt to restore confidence in the currency. Emphasis was also placed upon public spending cutbacks, increasing tax rates and issuing government securities. The effort, however, ended in failure. The government did not ultimately succeed in curbing expenditure, imposing new taxes and raising tax rates, nor did it manage to counter effectively the problem of goods shortages. Moreover, pre-war loans were not excluded from the exchange of old drachmas for new drachmas, resulting in the elimination of the domestic public debt and a large proportion of private savings. In addition, the political crisis acted as a further block to efforts to achieve monetary stability.

A new stabilisation effort was made in mid-June 1945. The basic priorities of the programme were to secure higher levels of foreign aid, to impose controls on imports, wages and prices, to ban the use of gold in money transactions and to devalue the drachma against sterling and the dollar (Varva-ressos, 1953). This effort, too, ended in failure.

Another monetary crisis struck the economy and led to social turmoil and an intense political crisis. With the signing of the Greek-British Agreement for Economic and Technical Assistance in January 1946, a third effort towards stabilisation began. The Greek government was obliged to restructure its public finances radically, the drachma was once again devalued and the March 1946 Law, re "Establishment and Operation of a Currency Committee," created a governing body, the Currency Committee, which was based in the head office of the Bank of Greece and which had the objective of controlling the issue of new money, safeguarding exchange rate stability and, above all, enforcing strict guidelines concerning the supply of credit to the economy.

This attempt to achieve stability was supported substantially by increased foreign aid, particularly from the Marshall Plan. However, the fall in inflation was slow. The reason for this was the fact that the Bank of Greece was trying to strike a balance between two conflicting goals: firstly, to stabilise prices and, secondly, to supply credit effectively in order to finance an upturn in economic activity.

9. Greece's economic miracle during the Bretton Woods period

After the end of the Civil War, the Greek economy entered a growth phase and took on a completely new structure.[31]

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30 See Zolotas (1944).

31 For a description of the structural characteristics of the Greek economy at the beginning of the 1950s and an appraisal of the development policies pursued, see Drakatos (2002).

The monetary and credit policies pursued became tighter and fiscal deficits began to decline. This turnaround happened gradually but steadily throughout the years from 1950 to 1952, and it resulted in a dramatic fall in inflation and also in the drachma's successful participation in 1953 in the Bretton Woods fixed exchange rate system. The period up until the middle of the 1960s was one of the rare periods in the country's economic history which was marked by very low inflation (4% per year on average) and rapid economic growth (approx. 7% per year on average). The devaluation of the drachma against the US dollar by 50% in 1953 (from 15,000 drachmas to 30,000 drachmas per dollar) made it possible to maintain monetary stability and to ensure a high level of competitiveness of Greek goods. The devaluation was accompanied by measures to rehabilitate the economy. These measures included a wide-ranging liberalisation of Greek external trade, with the relaxation of controls on trade flows and of many administrative restrictions on the operation of the markets. They also included limiting fiscal deficits and reducing the rate of money growth. Moreover, the monetary reform of May 1954 introduced a new drachma, (equivalent to 1,000 old drachmas). The decision to cut three zeros from all monetary values ushered in a new period of low inflation and restored public confidence in the currency.

Greek economic policy successfully concentrated on the target of achieving monetary stability. The 1 dollar = 30 drachmas exchange rate remained fixed for approximately two decades. This was due to many factors. First, the drachma joined the Bretton Woods system, and consistent adherence to its operating rules lent credibility to monetary policies being pursued and made it easier to lower inflationary expectations. Second, bringing the fiscal budget into balance, restructuring public spending plans with a reduction in consumer spending and increased investment spending all helped to improve confidence in the monetary policy pursued. Third, the containment of labour cost increases, which rose only in line with increased productivity, helped to keep domestic inflation down. Fourth, the growth rate of money supply was kept low, due to strict credit controls in the economy imposed by the Bank of Greece and the Currency Committee. Fifth, the very limited convertibility of the drachma (together with the maintenance of controls on import financing) reduced pressure from currency speculators. Finally, the growth of trade internationally, the downward trend of raw material prices and global monetary stability all lent their weight to domestic price stability and to the preservation of the drachma fixed exchange rate.

Economic growth was assisted by developments in the balance of payments. The part played by invisible transfers and capital inflows was substantial in improving the balance. The rise in invisible transfers was due both to increased levels of tourism and shipping and to remittances from Greeks living abroad.

The dramatic change in the composition of GDP per production sector is an indication of the structural changes which took place in the economy and society in Greece. This change in GDP reflects corresponding changes in the composition of employment. As can be seen in Chart 13, while 1/3 of the national product was derived from the primary sector in 1952, the secondary sector had, by 1974, taken its place, while the services sector continued to contribute more than half of GDP.

However, global monetary instability following

Chart 13

GDP composition by branch of economic activity

1952

tertiary sector
53%

primary sector
28%

secondary sector
19%

1974

tertiary sector
52%

primary sector
17%

secondary sector
31%

2002

primary sector
7%

secondary sector
22%

tertiary sector
71%
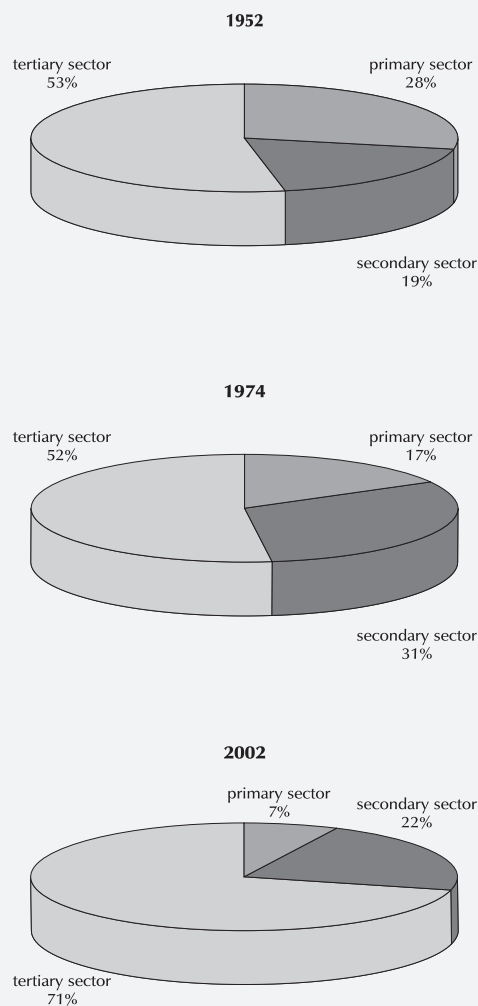
Source: NSSG.

the collapse of the international Bretton Woods standard and the termination of the dollar's convertibility into gold in August 1971, combined with the expansionary economic policy pursued during the period of the dictatorship, all acted together to bring an end to this long period of monetary stability and rapid economic growth.

10. Inflation and blocks on growth

With the restoration of democracy in 1974, it became easier for social groups to present their claims, establishing a democratic political system which favoured redistribution of income and wealth in favour of disadvantaged population groups. The State played a more active role as a producer and employer. Social models were redrawn to resemble more closely those of western European nations.

Efforts to redistribute income and wealth, the expansion of the State's economic activities and Greece's accession into the EEC were the three main elements of economic policy pursued during the first decade of the post-dictatorship period. Wealth redistribution and improved living standards achieved via borrowing against future generations led to large fiscal deficits. At the same time, income transfers from the EEC mainly went towards increasing personal income and private consumption of imported goods. The consequences of this policy were: labour costs which increased above and beyond the increase in productivity; high inflation; reduced competitiveness of the economy internationally; and a dramatic decline in private and public investment and, ultimately, in the growth rate of the economy. For more than twenty years after 1974, Greece had a particularly low rate of economic growth.[32] Chart 14 shows the path over time of

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[32] For an investigation of the causes behind inflation in Greece, the impact of inflation on the domestic economy and anti-inflationary policies pursued, see Garganas and Tavlas (2001). For the relationship between fiscal policies pursued, inflation, investment and the balance of payments, see Alogoskoufis (1993, 1995) and Alogoskoufis and Christodoulakis (1991).

Chart 14

The growth rate of GDP, 1961-2003

(Annual percentage change in GDP at 1995 constant prices)
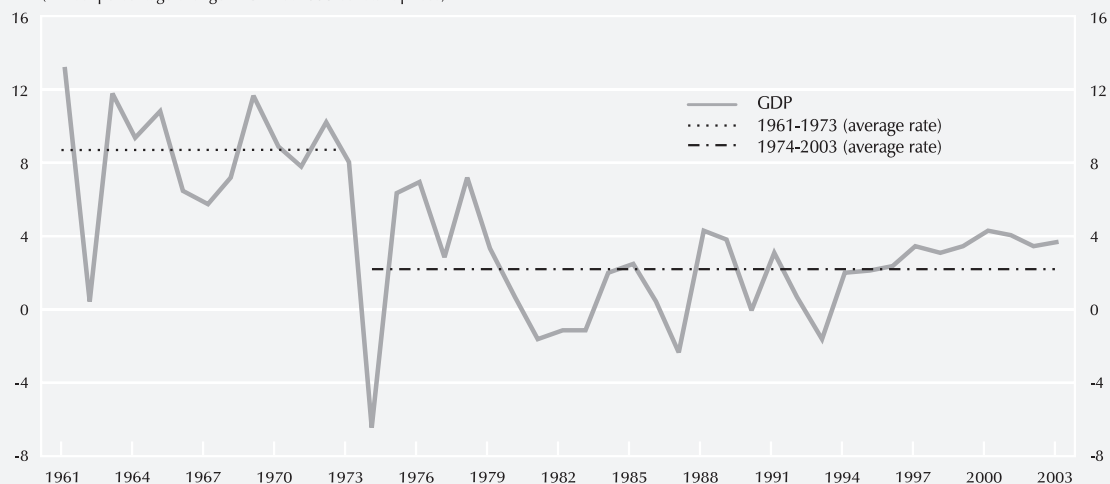
Source: *European Economy*, 2003, No. 4, Table 10, and European Commission, *Economic Forecasts*, Autumn 2003.

the growth rate from 1961 until today. In the period following 1974, the growth rate of real output was at least four times lower than in the period 1961-1973.

The Greek economy also suffered from strong inflationary pressures due to credit expansion and the enormous rise in the international price of oil. In 1973, a new dollar crisis led to a 10% devaluation of the dollar. Greece, however, continued to keep the drachma/dollar exchange rate fixed, which caused the drachma to fall against all other currencies. This fall, combined with rising oil prices and an overheating economy, led to a sharp rise in inflation, which reached 30%. The drachma was finally unpegged from the dollar in 1975 and its new exchange rate was set by the Bank of Greece on the basis of the weighted average of a basket of currencies. This all represented a sliding drachma policy, aimed at offsetting the impact of wage increases on the economy's international competitiveness.

Economic growth was brought to a halt, while inflation remained at very high levels. As is evident in Chart 15, Greece's inflation differential over that of the EU was high and positive throughout the 1980s and the first half of the 1990s. Moreover, as can be seen in Chart 16, Greece's divergence from the EU growth rate was also significant. At a time when Greece was facing large budget deficits, unsustainable public debt, negative growth rates and persistent inflation, governments in Western Europe were implementing tightened fiscal and monetary policies, their goal being to bring inflation down and establish an environment of monetary stability.

As early as the mid-1980s, it was clear that the expansionary economic policy being pursued by Greek governments could not be maintained.[33]

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33 For the theoretical basis of this policy, see Alogoskoufis (1992) and Alogoskoufis and Smith (1991). For its effectiveness in the case of Greece, see Brissimis and Leventakis (1989).

Chart 15

Inflation differential between Greece and the EU-15, 1961-2003

Note: Price deflator of private consumption expenditure, annual percentage changes.

Source: *European Economy*, 2003, No. 4, Table 25, and Ministry of Economy and Finance.

Chart 16

Growth rate differential between Greece and EU-15, 1961-2003

Note: GDP at 1995 constant prices, annual percentage changes.

Source: *European Economy*, 2003, No. 4, Table 10, and European Commission, *Economic Forecasts,* Autumn 2003.

A first crisis was observed in the balance of payments and led to the short-lived stabilisation programme of 1985-1987. This programme was based on limiting wage increases, but made no attempt to reduce the size of the public sector and the public debt. After the programme was abandoned at the end of 1987, wage increases again accelerated and the economy slipped into a phase of recession for two years in 1989 and 1990. Combined with political uncertainty during that

period, these developments made inflation and fiscal deficits accelerate again and caused new problems for the balance of payments.[34]

11. Greece in the euro area

The 1990s were a particularly important decade for the Greek economy, described as the "decade of convergence." Greek governments made efforts to counter the imbalances and distortions of the domestic economy in order for it to participate in the European Monetary Union.[35] Greece adopted a programme to tackle fiscal deficits, abandoned the sliding drachma policy and took some steps towards deregulating the economy. Progress towards the single currency demanded that all countries involved should undertake a convergence programme which would meet specific fiscal and monetary criteria. Meeting the five criteria of the Maastricht Treaty was an essential prerequisite for a country to enter the euro area, as this was considered to be the only way to ensure the nominal convergence of participating countries and to limit the risk of economic instability.

The convergence programmes provided for the fiscal and structural adjustment of the Greek economy.[36] Bringing down inflation was the primary goal of the monetary policy pursued. Abandoning the policy of sliding depreciation of the drachma and limiting fiscal deficits, largely via reduced interest rates on borrowing and increased tax revenues, all played a part in bringing inflation down to moderate levels during the period from 1991 to 1994. In 1995, the Bank of Greece set a specific figure (7%) as the final target for the reduction of inflation, and, as part of an

interim target for the exchange rate, it sought to limit the rate of the drachma's depreciation against the ECU to a percentage which would not fully offset the inflation differential between Greece and the other European Union countries. For the first time in more than twenty years, inflation fell to a single digit in 1995. The participation of the drachma in the European Monetary System's Exchange Rate Mechanism (ERM) in March 1998, following the devaluation of its central exchange rate against the ECU, and its entry into ERM II the following year, were conducive to the process of reducing inflation.

Having achieved nominal convergence of its economy with the economies of other countries in the European Union, Greece has since 2001 been attempting to exploit the benefits of monetary union. The focus of economic policy has shifted to achieving real convergence in terms of *per capita* GDP. Greece's economy in recent years has grown considerably (the GDP growth rate was 3.8% in 2002 and is estimated to have reached 4.0% in 2003). This is in contrast to the very sluggish economic activity within the euro area (0.9% and 0.4% respectively). Many factors have played their part in the increase in the domestic product: increased private consump-

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34 For an overview of fiscal developments, see Christodoulakis (1994) and Manessiotis and Reischauer (2001). See also Alogoskoufis and Philippopoulos (1992), Kapopoulos (1995) and Siokis and Kapopoulos (2002) for an empirical analysis of the impact of political fiscal cycles on economic performance. For an empirical investigation into the relationship between fiscal policy and inflation, see Demopoulos and Kapopoulos (2000) and Hondroyiannis and Papapetrou (1999). Finally, Gibson and Lazaretou (2001) analyse the cyclical behaviour of the Greek inflation process, while Hall and Zonzilos (2001) examine the determinant factors behind price and wage inflation in Greece.
35 Garganas and Tavlas (2001) showed empirically that a policy regime switch occurred in 1994.
36 The first convergence programme for the Greek economy was approved by ECOFIN in 1993. It was revised in September 1994.

Chart 17

Structural indicators of the Greek economy (EU-15=100)

A. Per capita GDP indicator, 1960-2003

B. Productivity indicator (GDP per employee) 1991-2003

Note: GDP at purchasing power parity.

Source: *European Economy*, 2003, No. 4, Table 9, and *Eurostat*.
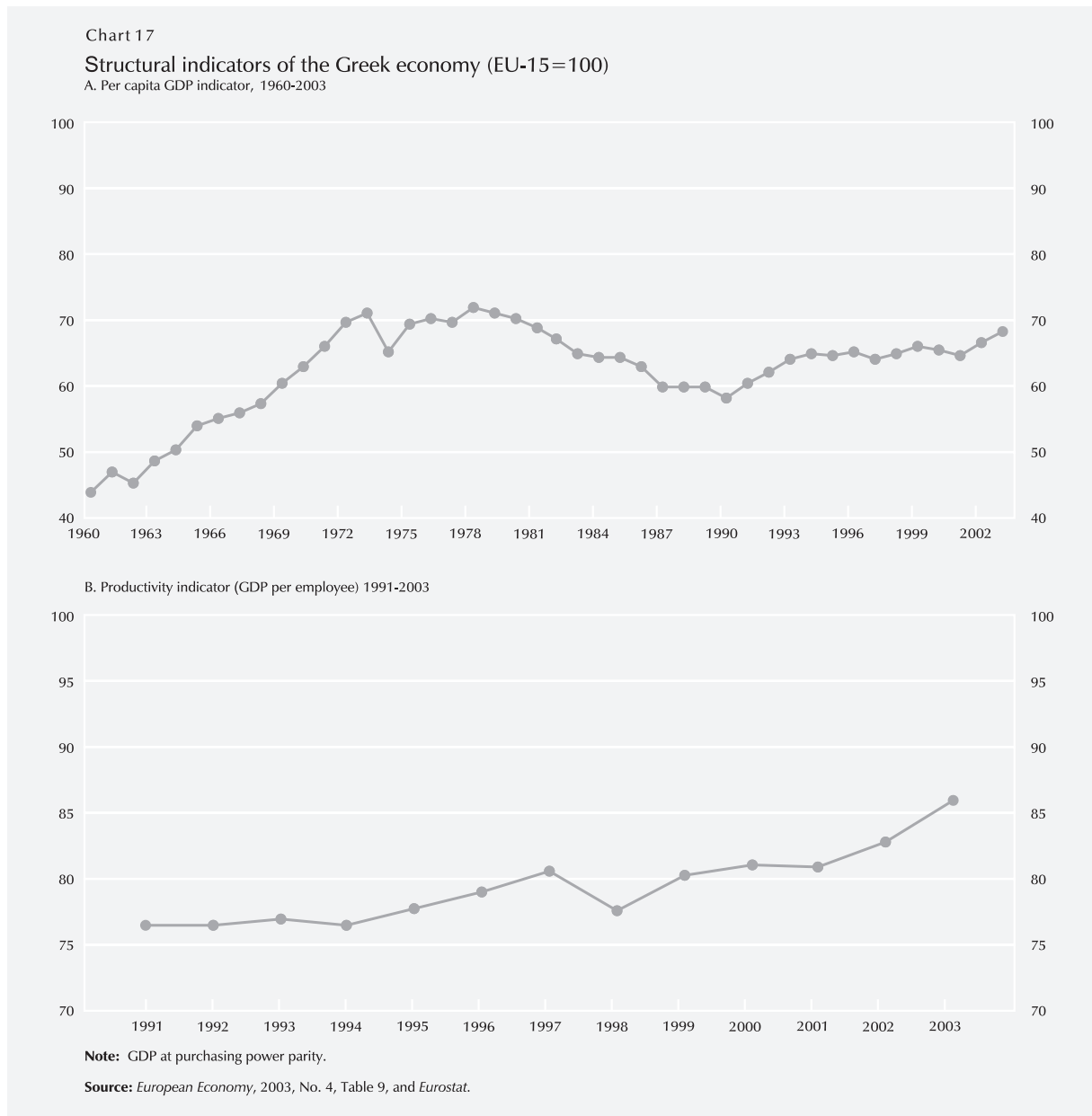
tion; greater investment, particularly investment in major public projects and the Olympics, and also in housing; as well as an increase in exports of goods. However, inflation remains high, although the differential between Greece and the euro area is beginning to narrow (it is estimated that the average annual increase in the Consumer Price Index was around 3.5% in 2003, i.e. the

same as in 2002). This differential has, of course, a negative effect on the price competitiveness of the Greek economy.[37]

As regards the structural features of Greece's economy, the change which has taken place since

[37] See European Central Bank (2003).

1974 in the composition of GDP by sector of economic activity is significant. The services sector now provides more than 2/3 of GDP, while the other sectors provide a smaller proportion, indicating a corresponding change in the composition of employment. Furthermore, based on the structural indicators for the Greek economy (see Chart 17), *per capita* GDP and productivity (GDP per employee) remain below the EU average (70% and 86% respectively).

Closing remarks

By joining the euro area economy, Greece has entered a new era, marked not only by new opportunities for growth but also by risks. These risks stem from the delay in implementing structural changes and the poor competitiveness of the domestic economy, which is now being called upon to operate within the new competitive environment of the globalised market.[38] Deregulation of the goods and services markets to improve their efficiency, privatisation, more efficient use of EU funding to bring about a substantial improvement in social and economic infrastructure, access to the information society and improvement in the productivity of public administration – all these are economic policy priorities in the EMU era with the aim of achieving real convergence.

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38 For details of these challenges and the role of the Bank of Greece, see Bryant, Garganas and Tavlas (2001).

References

In Greek

Alogoskoufis, G. and Lazaretou S. (2002), *The Drachma. From the Phoenix to the Euro*, Livanis Editions, Athens.

Andreades, A. (1904), *The History of the National Loans*, Part 1: The Independence Loans (1824-1825), Greek public debt during the Bavarian dynasty, Library of Historical Studies, Estia Publications, Athens.

Andreades, A. (1916), *Lectures on Public Finance and Statistics*, Part II: The Greek Tax System, Athens.

Angelopoulos, A. (1933), *Income Taxation in Greece*, Eleftheroudakis Publications, Athens.

Bank of Greece (1947), *Annual Report of the Governor for the Years 1941, 1944, 1945 and 1946*, Athens.

Bank of Greece (1978), *The First 50 Years of the Bank of Greece, 1928-1978*, Bank of Greece, Athens.

Christodoulakis, O. (2002), "The Reform of the Banking System and the Establishment of the Bank of Greece" in C. Hatziyosif (ed.) *History of Greece in the 20th Century: Between the Wars 1922-1940*, volume 2, Athens.

Demathas, Z., Kalafatis T. and Sakellaropoulos T. (1991), *Monetary Crises and How the Greek State Dealt With Them*, 1880-1930, Themelio Publications.

Drakatos, C. (2002), *Critical Thoughts on Greece's Economic Development in the Early 1950s*, lecture presented at a conference held on 22nd October 2002 in the Athens Academy, volume 77, issue B.

Katselidis, G. (1902), *The Currency*, Athens.

Kechagias, E. (1875), *The New Monetary System*, National Bank of Greece, 1927.

Kokkinakis, Y. (1999), *Currency and Politics in Greece, 1830-1910*, Hellenic Bank Association, Historical Library, Alexandria Publications.

Kostelenos, G. and Petmezas S. (2002), "Gross Domestic Product 1830-1939", *Sources of Economic History in Modern Greece, Quantitative Data and Statistical Series 1830-1939*, Historical records of the National Bank (forthcoming).

Kougeas, N. D. (1992), *Foreign Exchange and Monetary Policy in Greece, 1843-1879*, National Bank Educational Foundation, Studies in Economic History.

Kyrkilitsis, A. (1934), *Banks in Greece*, Athens.

Pharmakides, E. (1921), *The Exchange Rates During and After the World War*, Athens.

Simantiras, Y. (1905), *The Fiat Money Issue*, Athens.

Stasinopoulos, G. (2000), *Monetary Theory and Policy in Greece in 19th Century*, Typothito Publications.

Tragakis, G. E. (2001), *Economic History of the Greek People*, Volume 3, Society of Archive Study and Publications.

Valaoritis, J.A. (1902), *The History of the National Bank of Greece, 1842-1901*, volumes 1 and 2, Athens.

Valaoritis, J.A. (1911), *Annual Report of the Governor of the Bank of Greece for the Year 1910*, Historical Records of the National Bank, Athens.

Varvaressos, K. (1953), *My Work as Governor of the Bank of Greece*, K. Varvaressos's Records, File B1, Bank of Greece, Library.

Venezis, E. (1955), *The Chronicle of the Bank of Greece*, Athens.

Zolotas, X. (1929), *Monetary Stabilisation*, Greka Publications, Athens.

Zolotas, X. (1944), *The Monetary Issue*, K. Varvaressos's Records, File (13), D3 (B), Bank of Greece, Library.

In other languages

Alogoskoufis, G. (1992), "Monetary accommodation, exchange rate regimes and inflation persistence", *Economic Journal*, 102, 461-80.

Alogoskoufis, G. (1993), "Greece and European monetary unification", in H. Psomiades and S. Thomadakis (eds.) *Greece, the new Europe and the changing international order*, Pella Publishers, New York, 163-78.

Alogoskoufis, G. (1995), "The two faces of Janus: institutions, policy regimes and macroeconomic performance in Greece", *Economic Policy*, 20, 147-92.

Alogoskoufis, G. and N. Christodoulakis (1991), "Fiscal deficits, seigniorage and external debt: the case of Greece", in G. Alogoskoufis, L. Papademos and R. Portes (eds.) *External constraints on macroeconomic policy: the European experience*, CEPR, Bank of Greece and Cambridge University Press, Ch. 9, 264-303.

Alogoskoufis, G. and A. Philippopoulos (1992), "Inflationary expectations, political parties and exchange rate regimes: Greece 1958-1989", *European Journal of Political Economy*, 8, 375-99.

Alogoskoufis, G. and R. Smith (1991), "The Phillips curve, the persistence of inflation and the Lucas critique: evidence from exchange rate regimes", *American Economic Review*, 81, 1254-75.

Barro, R. (1987), "Government spending, interest rates, prices and budget deficits in the United Kingdom 1701-1918", *Journal of Monetary Economics*, 20, 221-47.

Bordo, M., M. Edelstein and H. Rockoff (1999), "Was adherence to the gold standard a 'good housekeeping seal of approval' during the interwar period?", NBER *Working Paper*, No. 7186.

Bordo, M. D. and L. Jonung (2000), "Lessons for EMU from the history of monetary unions", *Institute of Economic Affairs*, London, Readings 50.

Bordo, M. D. and F. Kydland (1995), "The gold standard as a rule: An essay in exploration", *Explorations in Economic History*, 32, 423-64.

Bordo, M. and H. Rockoff (1996), "The gold standard as a good 'housekeeping' seal of approval", *Journal of Economic History*, 56, 389-428.

Bordo, M. D. and E. N. White (1991), "A tale of two currencies: British and French finance during the Napoleonic wars", *Journal of Economic History*, 51, 303-16.

Brissimis, S. N., and J. A. Leventakis (1989), "The effectiveness of devaluation: A general equilibrium assessment with reference to Greece", *Journal of Policy Modeling*, 11, 247-71.

Bryant, R. C., N. C. Garganas and G. S. Tavlas (2001), "Introduction" in R. C. Bryant, N. C. Garganas and G. S.

Tavlas (eds), *Greece's economic performance and prospects*, 1-42, Bank of Greece and the Brookings Institution.

Christodoulakis, N. (1994), "Fiscal developments in Greece, 1980-93: A critical review", *European Economy*, Towards greater fiscal discipline, 3, 97-134.

Damiris, C. (1920), *Le système monetaire grec et la change*, Paris.

DeCecco, M. (1996), "The European monetary union: lessons of historical experience", Banca Nationale del Lavoro, Quarterly Review, Special Issue, *European monetary union: The problems of the transition to a single currency*, 56-68.

Demopoulos, G. and P. Kapopoulos (2000), "Government borrowing and expectational core inflation: evidence from Greece", *International Review of Economics and Business*, XLVII, 492-507.

Dritsas, M. (1999), "Monetary modernisation in Greece: bimetallism or the gold standard (1833-1920)", *Journal of European Economic History*, 28, 9-48.

Eichengreen, B. (1990), "Hegemonic stability theories of the international monetary system", in *Elusive stability: essays in the history of international finance*, Cambridge, Cambridge University Press, Ch. 11, 271-311.

Eichengreen, B. (1985), *The gold standard in theory and history*, London, Methuen.

European Central Bank (2003), *Inflation differentials in the euro area: potential causes and policy implications*.

Fergusson, N. (2000), "Latin and German lessons", *Financial Times*, 27 December.

Flandreau, M. (1993), "On the inflationary bias of common currencies: The Latin monetary puzzle", *European Economic Review*, 37, 501-616.

Flandreau, M. and M. Maurel (2001), "Monetary union, trade integration and business fluctuations in 19th century Europe: just do it", CEPR *Working Paper* No. 3087.

Garganas, N. C. and G. S. Tavlas (2001), "Monetary regimes and inflation performance: the case of Greece", in R. C. Bryant, N. C. Garganas and G. S. Tavlas (eds) *Greece's economic performance and prospects*, 43-102, Bank of Greece and the Brookings Institution.

Gennadios, J. (1878), *The Greek loans of 1824-25: How they were handled and what the world thought of, Opinions of the day without comment*, London.

Gervinus, G. G. (1863), *Insurrection et régénération de la Grèce*, volumes I and II. Translation into French by J. F. Minssen and L. Sgauta, Paris, A. Durand.

Gibson, H. and S. Lazaretou (2001), "Leading inflation indicators for Greece", *Economic Modelling*, 18, 325-48.

Giovannini, A. (1993), "Bretton Woods and its precursors: rules versus discretion in the history of international monetary regime", in M. D. Bordo and B. Eichengreen (eds), *A retrospective on the Bretton Woods system*, University of Chicago Press, 109-53.

Goodhart, C. (1988), *The evolution of central banks*, Cambridge, Massachusetts, MIT Press.

Grilli V. (1989), "Exchange rates and seigniorage", *European Economic Review*, 33, 580-87.

Grilli, V. and G. Kaminsky (1991), "Nominal exchange

rate regimes and the real exchange rate", *Journal of Monetary Economics*, 27, 191-212.

Hall, S. G. and N. G. Zonzilos (2001), "The determination of wage and price inflation in Greece: An application of modern cointegration techniques", in R. C. Bryant, N. C. Garganas and G. S. Tavlas (eds), *Greece's economic performance and prospects*, 211-35, Bank of Greece and the Brookings Institution.

Hondroyiannis, G. and E. Papapetrou (1997), "Are budget deficits inflationary? A cointegration approach", *Applied Economics Letters*, 4, 493-96.

Kapopoulos, P. (1995), "Disinflation and credibility in small open European economies in the 1980s: parties, elections and the ERM", *European Journal of Political Economy*, 11, 157-70.

Kindleberger, C. P. (1993), *A financial history of Western Europe*, London, Allen and Unwin.

Lazaretou, S. (1993), "Greek fiscal and monetary policies 1833-1914", *Journal of European Economic History*, 22, 285-311.

Lazaretou, S. (1995a), "Government spending, monetary policies and exchange rate regime switches: the drachma in the gold standard period", *Explorations in Economic History*, 35, 28-50.

Lazaretou, S. (1995b), "Inflation and real exchange rate behaviour under alternative nominal exchange rate regimes: The Greek experience of 1877-1936", *Greek Economic Review*, 17, 1-22.

Lazaretou, S. (1996), "Macroeconomic policies and nominal exchange rate regimes: Greece in the inter-war period", *Journal of European Economic History*, 25, 647-70.

Lazaretou, S. (1998), "International monetary regimes in historical perspective: A view from a peripheral country" in G. D. Demopoulos, P. G. Korliras and K. P. Prodromidis (eds) *Essays in economic analysis,* Sideris Publishers, Ch. 17, 287-311.

Lazaretou, S. (1999), "The drachma on the metallic monetary standards: lessons from the past", Bank of Greece, *Economic Bulletin*, No. 13, 7-27.

League of Nations (1927a), *Report to the financial committee of the League of Nations on Greece's public finances*, Bank of Greece.

League of Nations (1927b), *Report to the Financial Committee of the League of Nations on the role of the National Bank of Greece*, Bank of Greece.

Makinen, G. E. (1986), "The Greek hyperinflation and stabilisation of 1943-46", *Journal of Economic History*, XLVIII, 795-805.

Manessiotis, V. and R.D. Reischauer (2001), "Greek fiscal and budget policy and EMU", in R. C. Bryant, N. C. Garganas and G. S. Tavlas (eds), *Greece's economic performance and prospects*, 103-52, Bank of Greece and the Brookings Institution.

Meissner, C. M. (2002), "A new world order: explaining the emergence of the classical gold standard", NBER *Working Paper*, No. 9233.

Pepelasis-Minoglou, I. (1998), "Transplanting institutions: the case of the Greek central bank", *Greek Economic Review*, 19.

Redish, A. (1993), "The Latin monetary union and the emergence of the international gold standard" in M.D. Bordo and F. Capie (ed.), *Monetary regimes in transition*, Cambridge University Press, Ch. 3, 68-85.

Siokis, F. and P. Kapopoulos (2002), "Electoral management, political risk and exchange rate dynamics: the Greek experience", *Applied Financial Economics*, 13, 279-85.

Thomadakis, S. (1985), "Monetary arrangements and economic power in 19th century Greece: The National Bank in the period of convertibility (1841-1877), *Journal of the Hellenic Diaspora*, XII, 55-90.

Tsouderos, E. (1928), "La Banque de Grèce et la stabilization de la drachme", *Revue d' Economie Politique*, XLII, 1319-43.

UNRRA (United Nations Relief and Rehabilitation Administration) (1946), "Food and agricultural prospects in Greece, 1945-1946", Combined Working Party and UNRRA Greece Mission, March, Athens.

UNRRA (1947), "Agriculture and food in Greece", European Regional Office, Operational Analysis Papers, No. 19, January, London.

Varvaressos, K. (1928), "La stabilization de la drachme", *L' Europe Nouvelle*, 28.

Alternative measures of inflation

Nikos P. Karabalis

Bank of Greece
Economic Research Department

Euripides K. Kondelis

Bank of Greece
Economic Research Department

Given that inflation is defined as a systematic rise in the general price level of an economy, achieving and maintaining price stability —a primary objective of the European Central Bank— obviously presupposes that price changes are monitored with a series of price-related indices.

Inflation in Greece is recorded with the Consumer Price Index (CPI), which is compiled and published by the National Statistical Service of Greece (NSSG). Consumer price indices are used extensively worldwide to measure price behaviour. The Greek CPI is made up of the following 12 categories of goods and services:

1. Food and non-alcoholic beverages
2. Alcoholic beverages and tobacco
3. Clothing and footwear
4. Housing
5. Durable goods and services
6. Health
7. Transport
8. Communications
9. Recreation and culture
10. Education
11. Hotels-Cafés-Restaurants
12. Miscellaneous goods and services

These categories are further broken down into sub-categories and groups of final goods and services. These groups, which consist of more than one good and/or service for which market prices are collected, correspond to the most disaggregate level for which weights, derived from a breakdown of household consumption expenditure, are available.

The CPI is calculated using a Laspeyres formula, which gives each group of goods and services a

relative importance or "weight" (quantity x price) in accordance with the consumption pattern during a specified base period:

$$I^t = \sum_{i=1}^{t} R_i^t W_i, \quad i = 1,2,3,...,k$$

where:

I^t is the general price index at time t,
R_i^t is the respective index for item (i) for which a weighting coefficient is available,

$W_i = \dfrac{p_i^o q_i^o}{\sum p_i^o q_i^o}$ is the weighting coefficient for item (i),

and p_i^o and q_i^o are the respective price and quantity of item (i) during base period (0).

The CPI, as a weighted average index, reflects general inflationary trends. However, it is significantly influenced by exogenous factors, such as weather conditions (which affect the production of fresh fruit and vegetables) or international oil prices, as well as by factors that fall under government control, such as the rates charged by public utilities and enterprises, indirect taxes etc. These effects can result in temporary or more persistent changes, which, whether positive or negative, are nonetheless outliers and therefore do not necessarily reflect the actual inflationary pressures in the economy. As a result, the CPI does not always accurately capture the trend in the general price level, which reflects the equilibrium point between supply and demand in a given economy.

Using the initial detailed CPI data, one can construct a series of special indices[1] that provide useful information on the characteristics of inflation at a given moment. The purpose of alternative inflation measures is to remove "noise" from the original CPI

data. This can be done in a number of ways, especially when there is sufficient information on the size, the timing and the duration of the direct shocks from exogenous factors that are responsible for any unusual price changes for a given CPI item. Indirect shocks, however, are difficult to measure: their size can therefore only be roughly estimated with the use of special econometric/simulation models.

The present article examines two main categories of techniques. Those in the first category are based on the idea that certain items whose prices are particularly volatile are excluded from the CPI. The second category, on the other hand, uses statistical methods to identify and exclude outliers, such as the calculation of the "trimmed mean" and the "median". The indices examined here, henceforth referred to as Trend Inflation Indicators (TRIIs), are the following:

- "underlying" or "core" inflation (CPI less fresh fruit/vegetables and fuel),
- the CPIX, i.e. the CPI excluding outliers,
- the weighted median,
- the 5% Trimmed Mean (TM-5),
- the 10% Trimmed Mean (TM-10),
- the 15% Trimmed Mean (TM-15), and
- the 20% Trimmed Mean (TM-20).

Two main methods were chosen to identify the trend inflation indicators which better express the inflationary tendencies in any economy. The first and more widely used method evaluates the respective CPI sub-indices on the basis of their volatility. In other words, items, such as fresh

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[1] Several such indices are published by the Bank of Greece (*Annual Report, Report on Monetary Policy, Bulletin of Conjunctural Indicators*).

fruit/vegetables and fuel, whose price behaviour is particularly volatile and erratic by comparison with the overall CPI are excluded. "Underlying" or "core" inflation is a typical example of this category of indicator, which can then be compared with the all-items CPI.

The second method is based less on subjective criteria. Rather than being limited to an *ex ante* exclusion of certain CPI sub-indices, it places greater emphasis on overall trend inflation and is exclusively based on the symmetry or otherwise of the distribution of price changes for all items in the CPI. This method has the advantage of significantly reducing the risk of arbitrarily excluding a given price series contained in the CPI, and can therefore serve to estimate "true" or underlying trend inflation. Statistical indicators based on this approach include the weighted median and the trimmed mean.[2]

The weighted median is often used as an alternative measure of inflation as it places greater emphasis on the overall trend exhibited by all of the CPI component prices, and attaches less importance to extreme or non-representative price changes (in contrast to the all-items CPI, which is a weighted average). In order to better illustrate this difference, let us look at an actual example: In January 1999, the CPI rose year-on-year by 3.7%. 93.5% of the prices of goods and services included in the CPI rose by an average 4.6%, while the price of one single item, i.e. fuel, which accounts for 6.5% of the CPI basket, fell by 12.8%. The median inflation rate, that is the price change in the middle of the distribution of all price changes, was 5.0%. The difference between the changes identified by the mean (3.7%) and the median (5.0%) depends on how symmetric the

price changes distribution contained in the CPI is. When this distribution is skewed, the average inflation figure can mislead us with regard to the overall trend of inflation.

This discrepancy between the median and the mean can be explained by the following economic argument: The pricing policy of firms is largely determined by their general inflation expectations, and, of course, by changes in the firms' own production costs. In other words, anticipated inflation is one of the primary factors that firms take into consideration when adjusting their prices. However, whenever there is a sudden change in the rate of increase of one price series or one cost factor, *only the firms that are significantly affected by the sharp changes in relative prices or costs will in fact adjust their prices,* since adjusting prices entails a certain cost. This modifies the degree of symmetry exhibited by the price change distribution, with the result that average inflation is not necessarily representative of trend inflation.

The trimmed mean, like the median, is not affected by extreme price changes. The price change distribution for a given time period reflects two common factors: (a) Firms raise their prices based on anticipated average inflation; they do not expect sudden price changes and most of their price increases display inertia around the general inflation level. Their price change distribution is, thus, roughly symmetric. (b) However, as mentioned above, this price change distribution can easily become asymmetric around the mean, if the prices of certain products change sharply. When calculating the trimmed

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2 The weighted median and the trimmed mean are both widely used in the international bibliography and also in practice as alternative measures of inflation.

mean, these extreme (positive or negative) changes are dropped from both tails of the CPI-price change distribution, implying that the corresponding CPI items are each given a zero weight.

Methods of calculating trend inflation indicators

The alternative measures of inflation can be based either on an *ex ante* exclusion of specific items from the traditional CPI or on the *ex post* exclusion only of extreme price changes (regardless of the group to which these specific items belong). More specifically:

(a) "Underlying" or "core" inflation (CPI excluding fresh fruit/vegetables and fuel)

The weighted average of price changes for all items excluding fresh fruit/vegetables and fuel, known as "underlying" or "core" inflation, is compiled for 180 goods and services and excludes items such as fresh fruit, fresh vegetables, liquid gas, heating oil and petrol. The index is then constructed by assigning weights to the price changes of the remaining goods and services in the same manner as in the all-items CPI.

(b) The CPI excluding outliers (CPIX)

The weighted average CPI excluding outliers is compiled in a manner similar to the CPI, once the extreme price changes and their respective weights have been excluded. In order to determine which price changes are "extreme", the following procedure is usually followed: The first (Q1) and third (Q3) quartiles of the price change distribution are calculated. The difference

between the two gives us the Interquartile Range (IQR = Q3 − Q1), on the basis of which the lower and upper limits are determined as follows:

Lower Limit or LL= Q1 − 1.5 x IQR
Upper Limit or UL= Q3 + 1.5 x IQR

Any price change that is smaller than the lower limit or greater than the upper limit is considered a potential outlier, and as such is excluded with its respective weight from the calculation of the index.

(c) The Weighted Median

The weighted median is constructed by applying the median formula for a data distribution, once the distribution weights have been taken into account. More specifically, the price changes are ranked in increasing order with their respective weights. The weighted median is then defined as the 50th percentile of the cross-sectional distribution of price changes.

(d) The Trimmed Mean

The trimmed mean is compiled in the following manner: The price changes of the goods and services are ranked in increasing order. A number of observed goods and services are then excluded from both ends of the distribution, depending on the trimming percentage. In the 5% Trimmed Mean, for instance, a total of 18 goods and/or services are trimmed from the 180 goods and services contained in the Greek CPI. This means that the 9 highest and the 9 lowest price changes in the distribution are excluded (trimmed) from the data used to calculate the mean (5% of the observations from the left side of the distribution and 5% from the right side). Analogously, in a 10%

Chart 1
CPI and underlying (core) inflation developments
(Percentage changes over same month of previous year)

Source: Calculations based on National Statistical Service of Greece (NSSG) data.
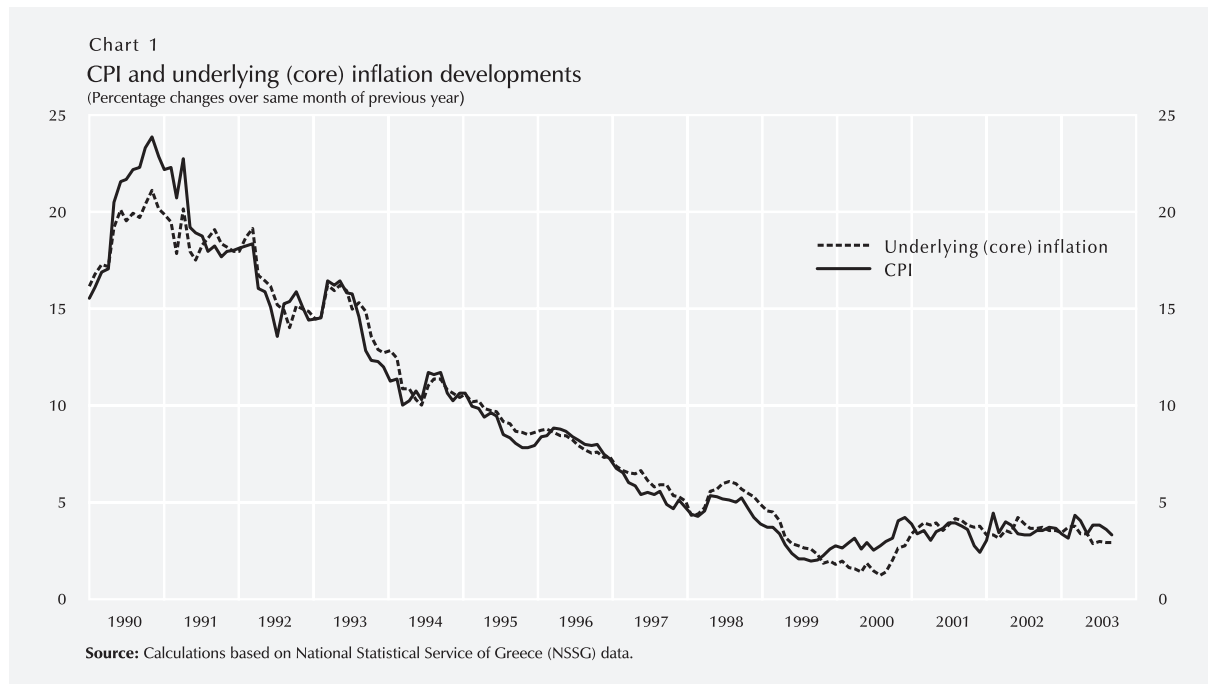
Table 1

Developments in the CPI, underlying (or core) inflation and fruit/vegetable and fuel prices
(1995-2002)

(Annual percentage changes)

Indices	Dec. '95	Dec. '96	Dec. '97	Dec. '98	Dec. '99	Dec. '00	Dec. '01	Dec. '02
CPI	7.9	7.3	4.7	3.9	2.7	3.9	3.0	3.4
Underlying or core inflation	8.6	7.4	5.1	4.9	1.8	3.4	3.3	3.5
Fruit and vegetables	−1.5	4.4	7.0	6.0	0.2	−3.8	39.6	−9.1
Fuel	4.4	8.2	−2.1	−15.1	24.0	18.6	−18.3	12.1

Source: Calculations based on NSSG data.

Trimmed Mean, the all-items CPI is trimmed to exclude a total of 36 goods and/or services.

Greece's CPI and price change distribution characteristics

Chart 1 plots the Consumer Price Index (CPI) against "underlying" or "core" inflation (CPI excluding fresh fruit/vegetables and fuel) from 1990 to August 2003.

As shown in Table 1, the volatility of fresh fruit/vegetable and fuel prices has had a definite impact on the general inflation level, as measured by the CPI.

A detailed study of the monthly distributions of 12-month price changes at different periods in

Chart 2

Distribution of year-on-year price changes in the CPI for December 2002

Frequency

Percentage changes
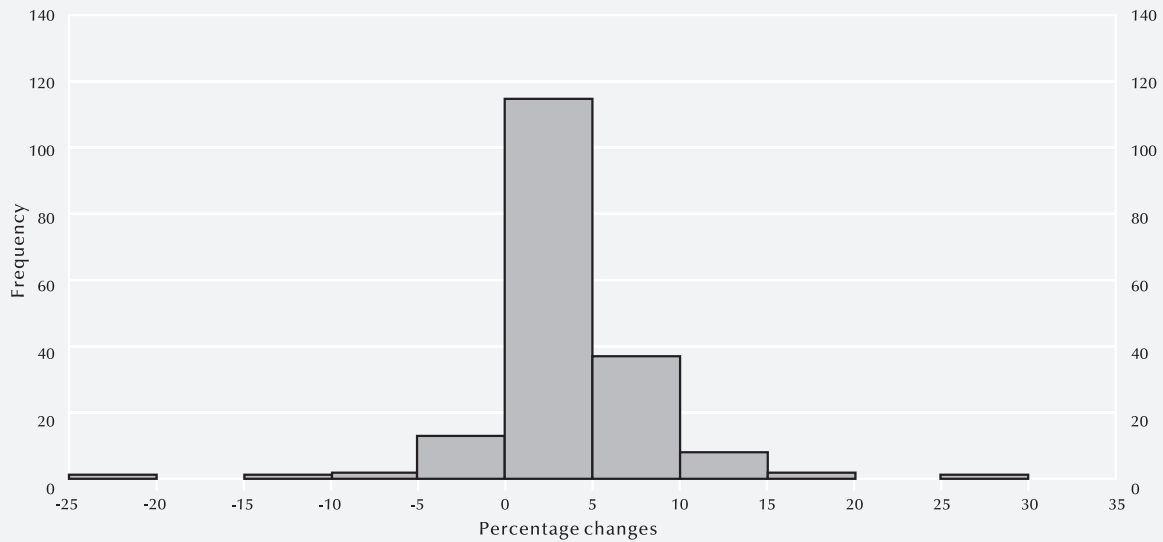
Chart 3

Distribution of year-on-year price changes in the CPI for December 1998

Frequency

Percentage changes
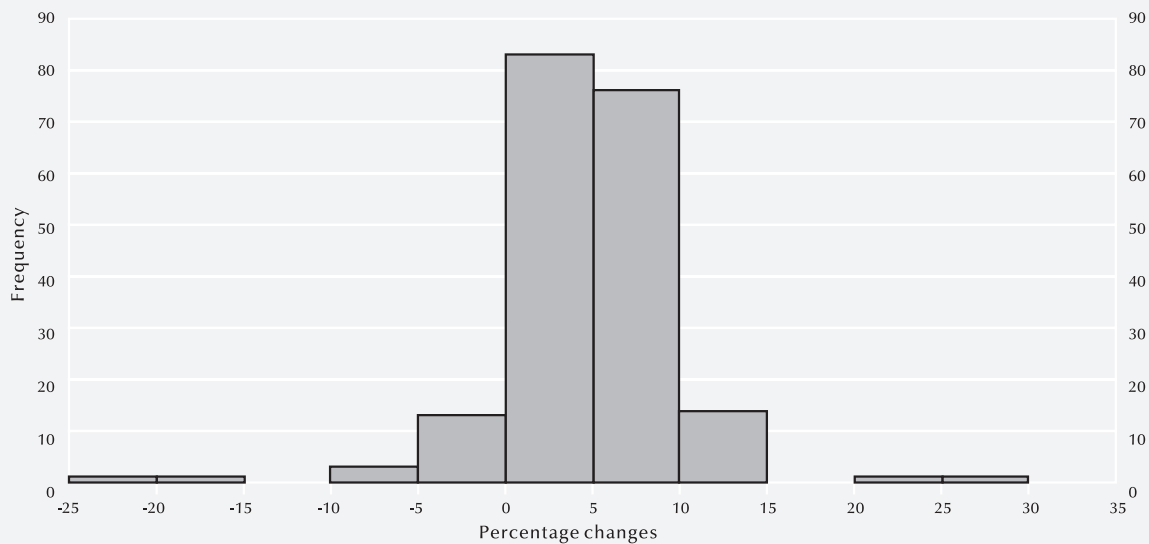
time clearly points to a continuous decrease in inflation. Charts 2, 3, 4 and 5 illustrate the monthly distribution of 12-month price changes in December 2002, 1998, 1994 and 1990.

A histogram of the 12-month price change distribution in December 2002 is presented in Chart 2. This distribution is roughly symmetric, as evidenced *inter alia* by the fact that the change in the

Chart 4
Distribution of year-on-year price changes in the CPI for December 1994

Source: Calculations based on NSSG data.

Chart 5
Distribution of year-on-year price changes in the CPI for December 1990

Source: Calculations based on NSSG data.
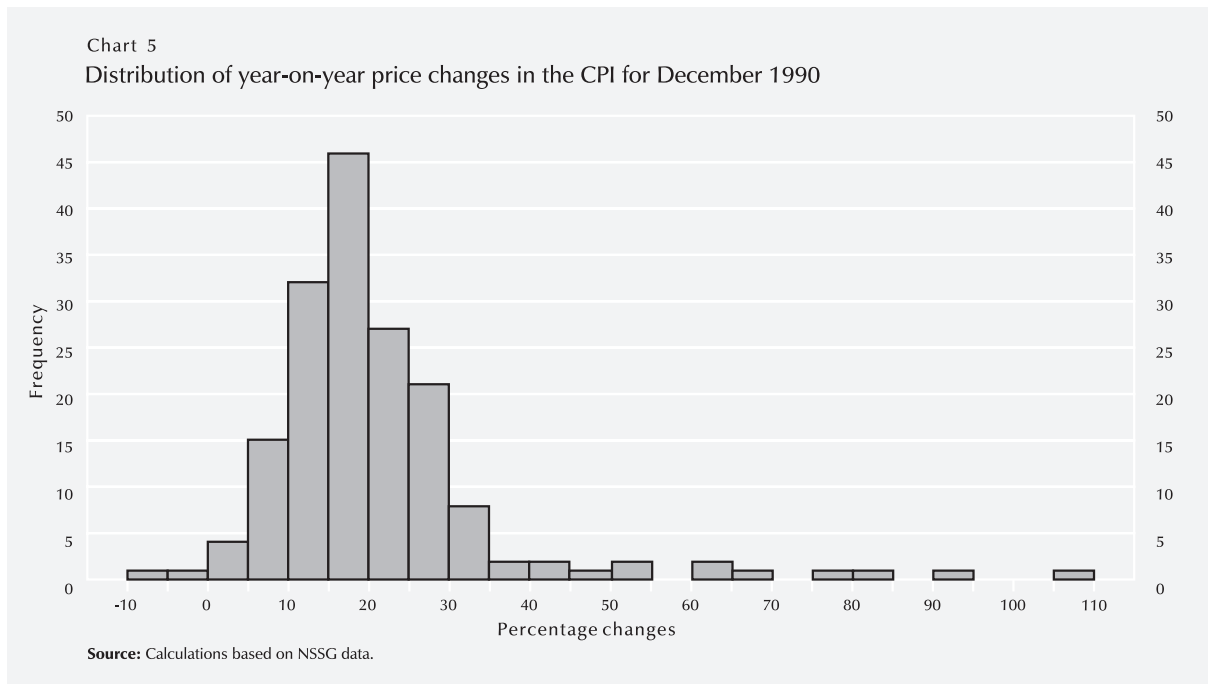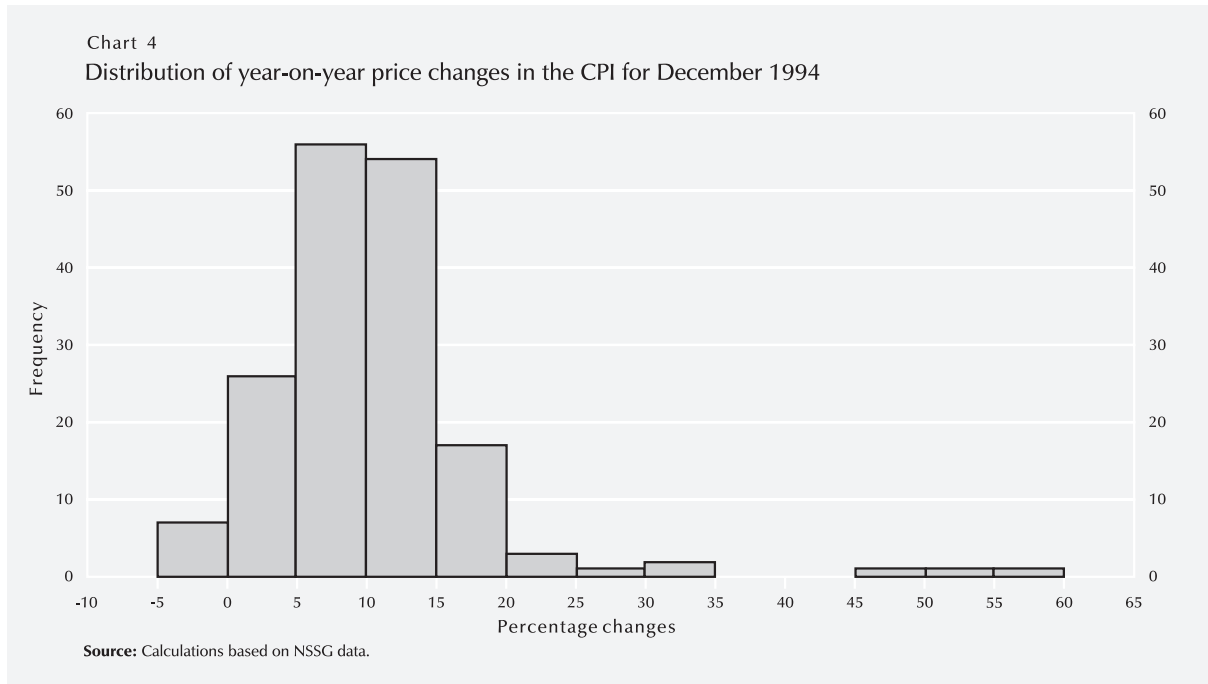
CPI (the mean) and the weighted median were 3.4% and 3.5%, respectively.

In contrast with December 2002, the months of December 1998, December 1994 and December 1990, as shown in Charts 3, 4 and 5, present either negative or positive skewness. More specifically, the histogram of the price change distribu-

tion for December 1998 (Chart 3) shows negative skewness. During that month, the change in the CPI amounted to 3.9%, while the change in the weighted median was 5.2%.

In December 1994, the change in the CPI was 10.7%, while the change in the weighted median was 9.9%. As a result, the distribution of price changes for that month, represented in Chart 4, clearly displays positive skewness.

A similar pattern can also be discerned in the distribution of price changes for December 1990 (Chart 5), which is also skewed to the right. This distribution also contains a large number of extreme price changes, some of which approach or even exceed 100%. During this particular month, the change in the CPI and the weighted median reached 22.9% and 20.3%, respectively.

Criteria used to assess the Trend Inflation Indicators (TRIIs)

In order to compare Trend Inflation Indicators and determine which one(s) best capture(s) trend inflation, one first needs a benchmark against which to judge each TRII. We use the moving median of monthly changes in the CPI for a 19-month period[3] (Median-19) as our first benchmark series, and 19-month moving averages (MA-19) as an alternative. Both benchmark series were constructed over centred moving 19-month periods. This implies that they were smoothed so as to be less sensitive to temporary price changes (as detailed in the following paragraph) and, as a result, are more suitable for comparison purposes than for use as alternative Trend Inflation Indicators.

The construction of the benchmark series is a simple procedure. For example, for the median of monthly CPI changes centred for 19-month moving periods, we calculate the median of the first 19 monthly changes in the CPI and place the result at the centre of the first 19-month period, i.e. in the 10th position. We then take the next monthly change, i.e. the 20th, and disregard the first. Continuing in this fashion, we move up each time by one observation and calculate the corresponding median, which we then place in its appropriate position. After completing this procedure for the entire time sample period, we can then work with our new median benchmark series, which, being substantially smoother than the initial data, can serve as a benchmark for assessing the various Trend Inflation Indicators. The alternative moving average benchmark was constructed in a similar fashion, taking the mean rather than the median on each occasion.

Chart 6 plots the CPI against the median (Median-19) and the moving average (MA-19) benchmark series. These measures obviously smooth out the CPI price change series and therefore are appropriate benchmarks for trend inflation. The Mean Squared Residual and the Correlation Coefficient serve as statistical criteria. More specifically, the Trend Inflation Indicator that obtains the lowest Mean Squared Residual or the highest Correlation Coefficient with the benchmark series is considered to better express "overall" or "real" trend inflation.

In order to ensure direct comparability between the TRIIs and the benchmark series, we recalcu-

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3 The main conclusions of this article do not change when benchmark series of different durations are used. The 19-month duration reported here presented the smallest standard deviation.

Chart 6
CPI, Median-19 and MA-19
(Percentage changes over same month of previous year)

Source: Calculations based on NSSG data.
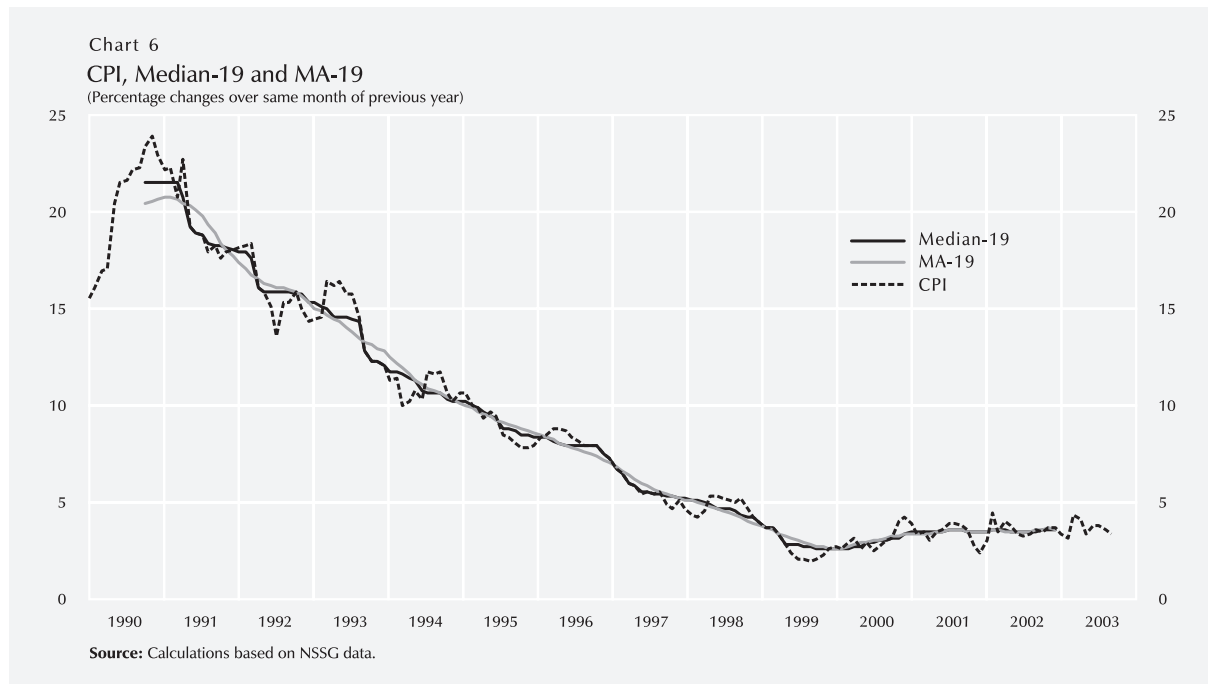
late the TRIIs using a simple linear regression, so that they have the same mean as the benchmark series. The benchmark series is used as the dependent variable, and each of the TRIIs serves as the independent variable.

In the case of the Mean Squared Residual criterion (MSR), we calculate the deviations from the benchmark series for each of the TRIIs, square them and obtain the mean of these squared deviations. The indicator with the lowest MSR was considered best, with:

$$\text{MSR} = \sum (\text{TRII}_t - \text{BS}_t)^2 / n$$

where: where:

MSR is the Mean Squared Residual,
TRII_t is the Trend Inflation Indicator at a given time t,
BS_t is the benchmark series at a given time t, and
n is the number of observations.

When using the Correlation Coefficient (r) as the statistical criterion, we calculate the Correlation Coefficient (r) between the trend inflation indicator and the benchmark series in each case. The indicator with the highest correlation coefficient is considered best, with:

$$r = \text{Corr}(\text{TRII}_t, \text{BS}_t).$$

Results

Using the Mean Squared Residual as the statistical criterion and the Median-19 as the benchmark series, we are able to conclude that the best indicator of trend inflation for the January 1998-August 2003 sample period was "underlying" or "core" inflation (CPI excluding fresh fruit/vegetables and fuel), followed by the CPIX (CPI excluding outliers). The remaining indicators rank in the following decreasing order of performance: the

Table 2
Performance of trend inflation indicators using the Median-19 as a benchmark series
(Jan. '98-Aug. '03)

Trend inflation indicators	Mean squared residual	Correlation coefficient
Underlying inflation	0.0399	0.8822
CPIX	0.0492	0.8522
TM-5	0.0528	0.8405
TM-15	0.0546	0.8344
TM-20	0.0555	0.8314
TM-10	0.0595	0.8179
CPI	0.0630	0.8061
Weighted median	0.0877	0.7159

Source: Calculations based on NSSG data.

Table 3
Performance of trend inflation indicators using the MA-19 as a benchmark series
(Jan. '98-Aug. '03)

Trend inflation indicators	Mean squared residual	Correlation coefficient
Underlying inflation	0.0282	0.8765
TM-20	0.0312	0.8626
TM-15	0.0313	0.8620
TM-5	0.0347	0.8456
CPIX	0.0356	0.8413
TM-10	0.0373	0.8329
CPI	0.0498	0.7685
Weighted median	0.0539	0.7464

Source: Calculations based on NSSG data.

Table 4
Performance of trend inflation indicators using the Median-19 as a benchmark series
(Jan. '93-Aug. '98)

Trend inflation indicators	Mean squared residual	Correlation coefficient
TM-5	0.1622	0.9810
TM-10	0.1767	0.9793
Underlying inflation	0.1870	0.9781
CPI	0.2343	0.9725
TM-15	0.3122	0.9631
Weighted median	0.4039	0.9520
TM-20	0.4164	0.9505
CPIX	0.4269	0.9492

Source: Calculations based on NSSG data.

Table 5
Performance of trend inflation indicators using the MA-19 as a benchmark series
(Jan. '93-Aug. '98)

Trend inflation indicators	Mean squared residual	Correlation coefficient
Underlying inflation	0.1544	0.9837
TM-10	0.1900	0.9799
TM-20	0.2394	0.9746
TM-30	0.3952	0.9578
CPI	0.4133	0.9558
TM-40	0.5570	0.9400
Weighted median	0.5919	0.9361
CPIX	0.6152	0.9335

Source: Calculations based on NSSG data.

5% Trimmed Mean, the 15% Trimmed Mean, the 20% Trimmed Mean, the 10% Trimmed Mean, the all-items CPI and, finally, the weighted median (Table 2). The same performance ranking is also obtained when the Correlation Coefficient (r) was used as the statistical criterion.

When using the moving averages (MA-19) as the benchmark series and either the Mean Squared

Residual or the Correlation Coefficient to assess performance, we reach the conclusion that "underlying" or "core" inflation (CPI excluding fresh fruit/vegetables and fuel) once again fares best, followed in second position by the 20% Trimmed Mean (Table 3).

We then use both benchmark series (Median-19 and MA-19) to compare the January 1998-August

2003 period, during which inflation was relatively stable, with an earlier period of equal duration (January 1993-August 1998), during which trend inflation was on the decline (see Tables 4 and 5). By comparing the results of Tables 4 and 5 with those of Tables 2 and 3, we are again able to conclude that underlying inflation fares best as an indicator of trend inflation, even for a period of declining inflation.

Conclusions

As shown in the previous analysis, the all-items CPI, though officially used to measure inflation, is not always the best tool for measuring and analysing trend inflation. This is due to the significant bias in the CPI caused by the price developments of specific items and by the unusual or extreme price changes presented at times by vari-

ous CPI components. We examined and compared the behaviour of several other indicators, which can be computed using the CPI data and which proved useful in monitoring and analysing inflationary tendencies. Our study showed that none of the indicators examined could, by themselves, indisputably and precisely capture existing inflationary tendencies, and that a combination of indicators should therefore be monitored concurrently.

From our analysis of the sample period data for 1998-2003, we were able to conclude that "underlying" or "core" inflation (CPI excluding fresh fruit/vegetables and fuel) fared best against both comparison criteria, regardless of the benchmark series used (median or moving average). The Bank of Greece has been studying and monitoring underlying CPI for several years now and, with the recent implementation of the HICP, has also begun calculating the other indicators.

References

Bryan, M. F. and S. G. Cecchetti (1993), "Measuring Core Inflation", National Bureau of Economic Research Working Paper Series, Cambridge, Massachusetts.

Cecchetti, S. G. (1996), "Measuring Short-run Inflation for Central Bankers", National Bureau of Economic Research Working Paper Series, Cambridge, Massachusetts.

Coimbra, C. and P. D. Neves (1997), "Trend Inflation Indicators", Banco de Portugal, *Economic Bulletin*.

European Commission (2002), *Quarterly report on the euro area*, Directorate General for Economic and Financial Affairs.

Kevork, K. H. (1984), *Statistics, Indices,* Theory and Practice (in Greek).

Reserve Bank of Australia (1994), "Measuring 'Underlying' Inflation", *Reserve Bank of Australia Bulletin* (1994).

Roger, S. (1995), *Measures of underlying inflation in New Zealand, 1981-95*, Reserve Bank of New Zealand.

Working Papers

(February - December 2003)

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

Empirical modelling of money demand in periods of structural change: The case of Greece

Working Paper No. 1
Sophocles N. Brissimis, George Hondroyiannis, P.A.V.B. Swamy and George S. Tavlas

This paper examines the behaviour of the demand for money in Greece during 1976Q1-2000Q4, a period that witnessed many of the influences that cause money-demand instability. During this period there has been widespread innovation and a transition from a highly regulated to an unregulated financial system. The capital account has also been opened, the last foreign exchange controls having been lifted in May 1994.

In the empirical analysis, the demand for money is estimated as a function of real income, the own rate of return on money, and the spread between T-bill rates and the own rate on money and inflation. Quarterly data are used in the estimation as well as two different empirical methodologies, vector error correction (VEC) modelling and second-generation random coefficient (RC) modelling.

The paper discusses extensively the second method, which has been developed theoretically and empirically in recent years. Standard estimation procedures often impose a number of restrictions, including the following: (i) estimated coefficients are constant; (ii) excluded explanatory variables are proxied by an error term and, are, therefore, assumed to have mean equal to zero and to be mean-independent of the included explanatory variables; (iii) the true functional form is known (whether linear or nonlinear); and (iv) the variables are not subject to measurement error. The RC method does not impose the above restrictions, but assumes that each of the estimated coefficients is the sum of three terms: a bias-free effect, an omitted-variables bias, and a measurement error. The bias-free components of these coefficients are the coefficients that would be observed if there were no measurement errors, no omitted variables biases, and the specification of the functional form was true. Therefore, the RC method differs from recursive VEC estimation since the latter does not write off the past and uses a specific functional form.

The coefficients of both the VEC and RC procedures support the hypothesis that, because of financial deregulation, the demand for money becomes more responsive to both the own rate of return on money balances and the opportunity cost of holding money. In general, both procedures also support the hypothesis that the income elasticity of money demand declines over time as a result of technological improvements in the payment system and the development of money substitutes which lead to economies of scale in holding money.

Greek monetary economics in retrospect: The adventures of the drachma

Working Paper No. 2
Sophia Lazaretou

A country's currency is perhaps one of the most important economic institutions. It appears that the interrelation between monetary and economic power and stability is reciprocal. A strong and stable economy facilitates the achievement and maintenance of monetary stability; and, conversely, monetary stability contributes to the smooth operation of markets and transactions and promotes saving, investment and economic growth.

This paper provides some historical perspective about the monetary and fiscal policies pursued in Greece during the period from the 1830s until the introduction of the euro. Since the formation of the modern Greek State, government officials have striven —sometimes with much effort— to keep up with international monetary developments. This stemmed from the fact that they understood that participation in a monetary club of powerful economies by a peripheral, poor and inflation-prone country with a weak currency and an underdeveloped money market, like the Greece of the time, could imply important benefits for the national economy. First, membership in a currency union or a fixed exchange rate regime is associated with greater trade integration since monetary uniformity reduces the transaction costs of trade considerably. Second, strict adherence to the specie convertibility rule enables peripheral countries to establish credibility for the nation's economic policy and facilitates the reduction of inflationary expectations and their stabilisation at a low level. Third, the fiscal and monetary discipline implied by the gold standard rule

reduces country risk and improves the country's international credit standing.

The paper divides the history of the drachma into seven parts. The first part discusses Greek monetary and fiscal developments in the pre-WWI period. In the classical gold standard era, Greek governments made repeatedly strong efforts, however unsuccessfully, to tie the drachma to the prevailing international monetary regime. The first time Greece consistently pursued a specie standard rule was in 1910, only four years before the collapse of the classical gold standard. The second part of the story reports on the experience of the Greek economy as a full member of the LMU. The third part concerns the inter-war period. After a long wartime period marked by political and social upheavals, monetary expansions and high inflation, Greece again tried to follow international monetary developments from the mid-1920s onwards. The country joined the inter-war gold-exchange standard and the drachma was pegged to sterling. The fourth part refers to the collapse of the monetary and real sectors of the Greek economy during the Occupation Period and presents the stabilisation efforts in the aftermath of the German occupation, while the fifth part concerns the golden era of the drachma. In 1953 the drachma was first devalued against the US dollar and then joined the Bretton Woods system of fixed rates. The sixth part presents the policy of the depreciating drachma in the post-Bretton Woods period. Finally, the last part deals with the path towards EMU and the end of the story of the drachma.

The dynamic adjustment of a transition economy in the early stages of transformation

Working Paper No. 3
Christos Papazoglou and Eric J. Pentecost

There are three stylised facts that characterised transition economies in the early years of liberalisation: a fall in output, a sudden sharp rise in inflation and a depreciation of the real exchange rate followed by a slower, steady appreciation. The fall in output has been largely attributed to negative supply shocks and to a credit crunch that led to the imposition of high real interest rates on enterprises. The rise in inflation was attributed to the early liberalisation of goods market prices, whose rise was in line with world prices following administered repression. The depreciation and subsequent appreciation of the real exchange rate during transition was due to the initial inflation shock followed by a gradual rise in productivity.

This paper attempts to provide a theoretical rationale for these stylised facts by setting out an aggregate model of a representative transitional economy. The model embodies some of the basic characteristics of such economies. In particular, it assumes an underdeveloped financial sector in which the central bank sets the short-term interest rate and there are few private capital inflows, which, although not necessarily legally restricted, are limited by fragile and thin financial markets which carry a high risk premium for international investors. Domestic residents can, however, use foreign money for domestic transactions as a means of hedging against high inflation as well as the economic instability and uncertainty that are characteristic of the early stages of the transition process. Furthermore, the analysis assumes that price liberalisation occurred in advance of financial liberalisation and structural reform. The impact of three shocks is considered as a result of the transition process: (a) an increase in real wage, (b) a rise in the interest rate due to liberalisation, and (c) a reduction in core inflation.

The analysis indicates that all three disturbances contributed to the occurrence of the three stylised facts which emerged at the early stages of the transition process. In particular, the reason for the initial fall in output was largely due to the slow speed of the supply-side reforms, which, as a result, did not bring about productivity gains to raise output. Overall, the analysis suggests that, notwithstanding sufficient structural reform, rapid price liberalisation has a depressing influence on output in transition economies.

To be published in *Journal of Macroeconomics*, June 2004.

An indicator measuring underlying economic activity in Greece

Working Paper No. 4
Stephen G. Hall and Nicholas G. Zonzilos

The conduct of effective economic policy requires timely information. However, high-frequency data, e.g. monthly data, which are very useful in assessing the current state of the economy and estimating short-term economic prospects, are highly volatile and erratic. In any given month, some indicators may rise, while others may fall, even in related sectors of economic activity. The construction of a coincident indicator as the single ''common component'' of all the short-term indicators used is of particular interest for economic policy makers.

The purpose of this paper is to compile an indicator of Greek underlying economic activity using Greek economic data. The construction of the Greek coincident indicator of underlying economic activity is based on the methodology developed by Stock and Watson (1991) to assess US economic activity; it was later used by Garrat and Hall (1996) for the UK economy.

Using a state space formulation, the coincident indicator is compiled as the common component of various short-term indicators, on the basis of the assumption that those indicators are affected by the general level of economic activity. Moreover, at the same time the indicator incorporates the effect of special factors related to specific sectors of economic activity.

To estimate the coincident indicator of the Greek economy, the following short-term monthly indicators are used:

— the index of industrial output (National Statistical Service of Greece, NSSG);

— the index of retail sales volume (NSSG);

— the volume of new buildings, proxied by the number of permits issued, with a four-month time-lag (NSSG);

— cement output (NSSG);

— non-oil exports (at constant prices, obtained by deflating Bank of Greece balance of payments statistics with the relevant sub-index of the NSSG Wholesale Price Index);

— travel receipts - i.e. receipts from foreign visitors (at constant prices, obtained by deflating Bank of Greece balance of payments statistics with the NSSG Consumer Price Index); and

— loans to the private sector (at constant prices, Bank of Greece data deflated with the NSSG Consumer Price Index).

In addition to the main monthly series presented above, an implicitly-calculated monthly GDP growth rate has been added to the short-term indicators. This monthly rate plays a key-identifying role in the compilation of the indicator because it is a reference variable that can be used to evaluate the relative weight of all the other highly-volatile indicators in the overall indicator. It is calculated using the inverted compound for-

mula $(1+g)*(1/12)$, where g is the annual GDP growth rate. It is constant during each calendar year and is smoothed using a seven-month moving average.

The high volatility of short-term indicators attributed to non-systemic factors related to activity in specific sectors is moderated by imposing the appropriate weighting to the corresponding matrices. The appropriate weighting is calculated as the ratio of the sample mean (or variance) of each variable expressed in monthly changes to the sample mean (or variance) of the monthly GDP growth rate for the sample period.

The advantage of the coincident indicator is that it reflects the systematic information contained in short-term indicators of activity and excludes irregular influences which increase volatility and make interpretation of the corresponding variables difficult.

Changes in financial structure and asset price substitutability: A test of the bank lending channel

Sophocles N. Brissimis and Nicholas S. Magginas

In this paper we investigate the existence of a bank lending channel in the transmission of monetary policy. This is a separate channel of monetary transmission, which operates in addition to the interest rate channel enhancing the effect of monetary policy on the real economy. A part of the empirical literature investigating the existence of the bank lending channel adopts a macroeconomic approach using aggregate (economy-wide) variables to identify the channel. These studies attempt to obtain indirect evidence for the existence of a lending channel through the examination of timing relationships between quantity or price variables and measures of the monetary policy stance. The evidence they provide, however, is inconclusive as they cannot distinguish shifts in loan supply from shifts in loan demand. Moreover, studies that use bank level data, in order to identify movements in loan supply, are not able to assess the importance of the channel for aggregate economic activity.

In this study we investigate the existence of the bank lending channel on the basis of the theoretical framework proposed by Bernanke and Blinder for the analysis of monetary transmission in the case that bank loans and bonds are imperfect substitutes in banks' and firms' balance sheets. We suggest a specification of this model that enables us to identify a separate loan supply function, the existence of which is a necessary condition for the operation of the bank lending channel. The empirical investigation is carried out by using multivariate cointegration techniques in order to identify the equilibrium relationships implied by the Bernanke and Blinder model, as cointegrating relationships.

We identify the equilibrium relationships of the Bernanke-Blinder model from a vector error correction model (VECM) and test appropriate restrictions that pertain to the existence of perfect asset substitutability. The implications of the model are tested for six major industrial countries (USA, Germany, Japan, France, UK and Italy) on the basis of a sample spanning the period from the mid-1970s through the end of the 1990s. Moreover, by conducting structural stability tests of the estimated cointegrating relationships, we examine whether changes in financial markets over the last two decades have affected the degree of asset substitutability and thus the potency of the lending channel.

Our results indicate that in the US and the UK, representing the "Anglo-Saxon type" of financial market structure, the lending channel is inoperative, while in Japan it is still important for monetary transmission. The other three countries examined —Germany, France, Italy— are in between, with the lending channel losing its potency in the last decade.

Capital flows and speculative attacks in prospective EU Member States

Working Paper No. 6
Heather D. Gibson and Euclid Tsakalotos

A key issue facing transition economies who are prospective EU members is that of the exchange rate policy they will pursue in the period between EU and euro area entry. It is anticipated that ERM II membership, which involves a commitment to a pegged exchange rate, will be necessary for a period of at least two years, in line with the Maastricht Treaty and the obligations fulfilled by current euro area members. An important factor determining the ease with which this commitment will be met is the extent to which the transition economies experience large and variable capital flows along with the determinants of these flows.

The purpose of this paper is to shed some light on this issue by examining the capital flow experience of the prospective EU members. We show that they have been experiencing fairly sizeable capital flows since the early 1990s. The existing literature on these flows either focuses on individual economies or examines the determinants of foreign direct investment (FDI) flows. Our contribution is to focus on private capital flows (excluding the more stable FDI flows), that is, flows which may complicate the conduct of macroeconomic policy; we test the sensitivity of our results to the exclusion of FDI flows. Furthermore we use a panel of countries, allowing us to draw some broader conclusions about the nature of such flows rather than concentrating on the peculiarities of certain countries.

In order to explain capital flows, we estimate two separate models. The first attempts to explain the level of capital flows; the second model focuses specifically on speculative crises by estimating the probability of a country experiencing downward speculative pressure. In both cases, we distinguish between the impact of what we refer to as "domestic factors", that is, macroeconomic aggregates that are largely under the control of the domestic authorities or at least are influenced directly by their policies, and the effects of contagion, either through economic fundamentals or otherwise. If contagion from financial crises in other parts of the region/world is a feature, then this implies that, in spite of successful domestic policies, the maintenance of the exchange rate peg could be complicated by developments in other countries which have spillover effects in the domestic economy. The results of both models suggest that, while domestic factors have a role to play in explaining capital flows and downward speculative pressure, this role is rather limited. Moreover, there is clear evidence of contagion effects. This suggests that macroeconomic policy in the prospective EU members will be complicated by capital flows in the run-up to euro area membership.

To be published in *Economics of Transition*, 2004, 12, 3.

The importance of variance stationarity in economic time series modelling:
A practical approach.

Working Paper No. 7
Alexandros E. Milionis

Testing for non-stationarity in the level of a time series is a standard preliminary procedure in analysing time series and there is a plethora of methodologies for this purpose. However, testing for non-stationarity in the variance is sometimes neglected in applied research. In this study, the possible consequences of the presence of variance non-stationarity in stochastic models for economic time series are examined. In particular, it is shown that the presence of such kind of non-stationarity leads to a wrong specification of univariate ARIMA models. So an *ad hoc* methodology for detecting and correcting for variance non-stationarity is suggested. Stabilising the variance, following this *ad hoc* approach, the number of the parameters of an ARIMA model is vastly reduced. Based on the above discussion, it is further argued that the usual autocorrelation tests for the hypothesis of weak form efficiency in financial markets are inappropriate when based on the first differences of asset prices. Finally it is shown how the analysis of extreme values (outliers) in economic time series is affected by the presence of variance non-stationarity.

The effect of dynamic hedging of options positions on intermediate-maturity interest rates

Th. Christodoulopoulos and Ioulia Grigoratou

According to recent data from the Bank for International Settlements, the market for interest rate derivative products has grown significantly. In particular, the daily turnover of the euro-denominated interest rate options market is now similar to that observed in the equivalent market for US dollar-denominated interest rate options. Derivative products (and, to be more precise, options) are not usually traded in organised markets but are offered almost exclusively over-the-counter. Dealers in the euro-denominated interest rate options market, acting as intermediaries, buy and sell options on a continuous basis to accommodate their own needs and the needs of their customers. The Bank for International Settlements survey data reveal that dealers in this market sell some 25% more options than they purchase and are, therefore, exposed to the interest rate risk inherent in the position created by absorbing this excess demand.

This paper examines the effect on current intermediate-maturity interest rates, i.e. on the medium-term segment of the European yield curve, of the action of dealers aimed at covering themselves for the risk inherent in their net options positions. Dynamic hedging consists of buying (selling) extra quantities of the underlying asset when its price increases (decreases). In technical terms, this tactic is called "maintaining a Delta neutral position". The final effect of this tactic is expressed as a positive feedback in the price move of the underlying asset (and by symmetry to its yield). For the purpose of our analysis, the underlying assets are German government bonds of three-, five- and ten-year maturity. It is worth noting that the positive feedback effect is brought about by the aforementioned tactic, implemented in a purely mechanistic way, i.e. it is unrelated to expectations of market participants about the future level of interest rates.

The effect of the positive feedback on the medium-term segment of the yield curve has already been studied in relation to US dollar-denominated interest rate options and the US yield curve. The study of the issue in this paper is the first of its kind for the European market, while the results obtained are fairly similar for the two markets. The data sample covers the period 1993-2002. The size of the feedback effect is measured by estimating an equation where the dependent variable is the change in the five-year rate, while the independent variables are the changes in the three-year forward and five-year forward interest rates with one lag, as well as the dependent variable with one lag. In addition, the equation includes an error correction term that is estimated by employing the Johansen procedure. The coefficient on this term relates to the existence of a long-run equilibrium relationship within which short-term deviations take place due to positive feedback effects.

A relatively small-sized positive feedback in the direction in which yields are moving is found only during periods characterised by significant changes in interest rates. Furthermore, the size of

the feedback increases considerably in periods characterised by strong expectations of an interest rate change. If this hypothesis holds, then short-term movements of the yield curve should be interpreted with caution when used to make inferences about expectations of the evolution of economic fundamentals. Also, under those circumstances the positive feedback effect can be fairly value-subtractive, since it reinforces market trends, and this should be taken into account in portfolio risk management.

Monetary policy and financial system supervision measures

(July 2003 - January 2004)

Monetary policy measures of the Eurosystem

10 July, 31 July, 4 September, 2 October, 6 November and 4 December 2003

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.

8 January 2004

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.

12 January 2004

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 2004 from €15 billion to €25 billion. This increased amount takes into consideration the higher liquidity needs of the euro area banking system anticipated for the year 2004. The Eurosystem will, however, continue to provide the bulk of liquidity through its main refinancing operations.

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

1 July 2003

The rules of operation of the "EURO-HERMES" System for the real-time settlement of payment orders in euro are amended with the introduction

of a new compensation scheme in cases of a EURO-HERMES malfunctioning. Electronic money institutions are excluded from participating in this System.

2 July 2003

DVD Bank AG based in Frankfurt, Germany, is authorised to establish and operate an agency in Greece.

18 July 2003

— The provisions of Bank of Greece Governor's Act No. 2438/6 August 1998 concerning the Board of Directors, the Audit Committee and the Internal Audit Department of credit institutions are modified.

— The National Bank of Greece is authorised to establish:

- three new units in Albania;
- three new units in Romania; and
- four new units in Serbia-Montenegro.

23 July 2003

Bank of Greece provisions on the solvency ratio of credit institutions established in Greece are codified into a single text. By the same text, emphasis is put on the need to exercise supervision on a consolidated and sub-consolidated basis and the Bank of Greece is authorised to set specific requirements as to the monitoring and assessment of the solvency ratio of credit institutions.

27 August 2003

Piraeus Bank is authorised to merge with the Hellenic Industrial Development Bank through absorption of the latter by the former.

2 September 2003

— Aspis Bank is authorised to acquire the two-branch network of Grindlays Bank in Greece.

— EFG Eurobank-Ergasias is authorised to increase its participation in the share capital of the Romanian bank "Bank Post" from 36.25% to 53.25%.

— "Piraeus Leasing S.A." is authorised to merge with "ETBA Leasing S.A" through absorption of the latter by the former.

26 September 2003

— The Bank of Greece authorises "Diners Club of Greece S.A." to convert to a credit company.

— Provisions concerning the submission of semi-annual debtor lists by banks operating in Greece to the Bank of Greece are codified and supplemented. The threshold for reporting to the Bank of Greece a borrower's overall outstanding debt with a bank is €1,500,000 (on a consolidated basis).

10 October 2003

The National Bank of Greece is authorised to acquire 81.7% of the share capital of Banca Romaneasca S.A." based in Bucharest, Romania.

29 October 2003

Piraeus Bank is authorised to increase its holding in the share capital of its subsidiary "Marathon Banking Corporation" from 53.68% to 79.19%. The latter is authorised to acquire all the shares of "Interbank of New York".

18 November 2003

The National Bank of Greece is authorised to establish 5 new units in Serbia-Montenegro.

28 November 2003

"HSBC Republic Bank (Suisse S.A.)" based in Geneva, Switzerland, is authorised to establish and operate an agency in Greece.

2 December 2003

EFG Eurobank-Ergasias is authorised to merge with Unitbank S.A. through absorption of the latter by the former.

8 December 2003

— Provisions governing the granting of authorisation by the Bank of Greece for the establishment of credit institutions in Greece, as well as for the establishment of domestic branches of credit institutions incorporated in European Economic Area (EEA) or non-EEA countries, are codified and supplemented.

— The Bank of Greece is authorised by Law 3148/2003, which has transposed the Community legislation on Electronic Money Institutions into Greek law, to set prudential supervision rules for such institutions.

11 December 2003

Alpha Bank is authorised to establish two new units in Bulgaria.

Decisions of the Bank of Greece

R e: Codification of the provisions of Bank of Greece Governor's Act 2054/18 March 1992, as amended, on the solvency ratio of credit institutions established in Greece (Bank of Greece Governor's Act 2524/23 July 2003)

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

a) the Statute of the Bank of Greece, in particular Article 55A thereof;

b) Article 1 of Law 1266/2 July 1982 "Authorities responsible for the conduct of monetary, credit and exchange rate policies, and other provisions" in conjunction with Article 12, paragraph 1, of Law 2548/1997;

c) Law 1665/1951 "Banking operations and supervision";

d) Article 1 (paragraphs 1 and 3) of Law 1338/ 12/17 March 1983 on the application of the European Community law, as amended by Article 6 of Law 1440/1984, Article 65 of Law 1892/1990 and Article 2, paragraph 2, of Law 2077/1992 on the ratification of the Treaty on European Union, as well as Article 19 of Law 2367/1995;

e) Law 2190/1920, as amended;

f) Law 2076/1992 "Taking up and pursuit of the business of credit institutions, and other related provisions", as applicable;

g) Annex IX to Law 2155/1993 ratifying the Agreement on the European Economic Area, as amended;

h) Bank of Greece Governor's Act 2054/18 March 1992 "On the solvency ratio of credit institutions established in Greece", as amended by Bank of Greece Governor's Acts 2349/15 February 1995, 2387/6 May 1996, 2409/27 March 1997, 2479/27 August 2001, in particular Article 16 thereof, and 2512/30 December 2002;

i) Bank of Greece Governor's Act 2421/19 September 1997 "Investment services by the Hellenic Industrial Development Bank";

j) Bank of Greece Governor's Act 2397/7 November 1996 on the capital adequacy of credit institutions, in particular the provisions of paragraph 9 thereof on reporting, as amended by Section E, paragraph 3, of Bank of Greece Governor's Act 2494/27 May 2002;

k) Directive 2000/12/EC of the European Parliament and of the European Council of 20 March 2000, in particular Articles 1(4), 1(12)-1(20), 1(27) and 40 to 47 thereof and Annexes II, III και IV thereto, codifying Directive 89/647/EEC/30 December 1989 as amended;

has decided to codify the provisions of Bank of Greece Governor's Act 2054/18 March 1992 and subsequent amendments thereto into a single text and define as follows the solvency ratio of credit institutions established in Greece:

SECTION ONE: SCOPE

This Act shall apply to all credit institutions established in Greece, excluding the Postal Savings Bank and the Deposits and Loans Fund. By a subsequent Governor's Act, the Bank of Greece may include in the scope of this Act one or both of the exempted credit institutions.

SECTION TWO: DEFINITIONS

1. For the purpose of this Act:

a) "competent authorities" shall mean the authorities empowered to supervise credit institutions. The competent authority for credit institutions established in Greece shall be the Bank of Greece;

b) "Zone A" shall comprise all the European Union (EU) Member States and all other countries which are full members of the Organisation for Economic Cooperation and Development (OECD), as well as those countries which have concluded special lending arrangements with the International Monetary Fund (IMF) and are associated with the Fund's general arrangements to borrow (GAB);

However, any country which reschedules its external sovereign debt shall be excluded from Zone A for a period of five years.

c) "Zone B" shall comprise all countries not in Zone A.

d) "Zone A credit institutions" shall mean all credit institutions authorised in the EU Member States, in accordance with the relevant EU legislation, including their branches in third countries, as well as all private and public undertakings covered by the definition of credit institutions under EU legislation and authorised in other Zone A countries, including their branches;

e) "Zone B credit institutions" shall mean all private or public undertakings authorised outside Zone A and covered by the definition of credit institutions in accordance with EU legislation, including their branches within the Community;

f) "non-bank sector" shall mean all borrowers other than credit institutions as defined in points d and e of this paragraph, central banks and central governments, regional governments and local authorities, the European Communities, the European Investment Bank (EIB) and multilateral development banks as defined in point g of this paragraph;

g) "multilateral development banks" shall mean the European Bank for Reconstruction and Development, the International Bank for Reconstruction and Development, the International Finance Corporation, the Inter-American Development Bank, the Asian Development Bank, the Council of Europe Development Bank, the Nordic Investment Bank, the Caribbean Development Bank, the African Development Bank, the European Invest ment Fund, the Inter-American Invest-ment Corporation and any other establishment that may be included in this definition in future, according to EU legislation;

h) "full-risk", "medium-risk","medium/low-risk" and "low-risk" off-balance-sheet items shall mean the items referred to in Section six, para 2b hereof and listed in Annex I to this Act;

i) "parent undertaking", "subsidiary" and "group (of undertakings)" shall mean the legal persons described in Article 42e of Law 2190/1920, as

amended, and in Article 2 of Presidential Decree 267/1995, as amended;

j) For the purposes of Section six, paragraph 1, point b, and of Section eight, the concept of "local authorities" shall include non-commercial administrative bodies responsible to central governments or to local authorities and those non-profit undertakings owned by central governments or local authorities or authorities which, in the view of the competent authorities, exercise the same responsibilities as local authorities. The concept of "local authorities" shall also include churches and religious communities having the status of legal persons under public law, insofar as they are empowered by law to impose taxes. However, in the latter case, the option set out in Section seven shall not apply.

k) "recognised exchanges" shall mean exchanges that, in the view of the Bank of Greece:

— function regularly,

— are governed by rules issued or approved by the competent authorities of the home country of the exchange, which define the conditions for the operation of the exchange, the conditions of access thereto as well as the conditions that must be satisfied by a contract before it can effectively be dealt on the exchange,

— have a clearing mechanism that provides for contracts listed in Annex III to be subject to daily margin requirements offering

adequate protection in the opinion of the Bank of Greece.

SECTION THREE: GENERAL PRINCIPLES

1. The solvency ratio referred to in the following paragraphs expresses own funds, as defined in Section four of this Act, as a proportion of total assets and off-balance-sheet items, risk-adjusted in accordance with Section five.

2. The solvency ratios of credit institutions which are parent undertakings shall be calculated on a consolidated basis in accordance with paragraphs 2 and 3 of Article 6 of Presidential Decree 267/1995.

3. Further to the provision of the previous paragraph, all credit institutions authorised in Greece shall each calculate an unconsolidated ratio and, whenever required by the Bank of Greece Department for the Supervision of Credit and Financial Institutions, a subconsolidated ratio.

4. Without prejudice to credit institutions' compliance with the requirements of the previous paragraphs of this section, solvency ratios shall be calculated not less than four times each year. The Bank of Greece may require more frequent calculation of solvency ratios.

5. The Bank of Greece may, by way of arrangements based on the principle of reciprocity, delegate to the competent authorities of another Member State its responsibility for supervising the solvency of credit institutions that have been authorised in Greece and are subsidiaries of credit institutions the registered offices of which are located in the said EU Member State.

SECTION FOUR: OWN FUNDS

For the purposes of this Act, own funds shall be defined as in Bank of Greece Governor's Act 2053/18 March 1992, as amended. Such own funds shall form the numerator of the solvency ratio.

SECTION FIVE: RISK-ADJUSTED ASSETS AND OFF-BALANCE-SHEET ITEMS

1. The total of the risk-adjusted values of the assets and off-balance-sheet items mentioned in the following paragraphs shall form the denominator of the solvency ratio.

2. Degrees of credit risk, expressed as percentage weightings, shall be assigned to asset items in accordance with the provisions of Sections six and seven and taking into account, when applicable, the exemptions referred to in Sections eight and ten.

3. In the case of the off-balance-sheet items listed in Annex I, a two-stage calculation as prescribed in Section six, paragraph 3 hereinbelow, shall be used.

4. In the case of the off-balance-sheet items referred to in Annex III, the potential costs of replacing contracts in the event of counterparty default shall be calculated by means of one of the two methods set out in Annex II. Those costs shall be multiplied by the relevant counterparty weightings as per Section six, paragraph 1, except that the 100% weightings as provided for there shall be replaced by 50% weightings to produce risk-adjusted values.

SECTION SIX: RISK WEIGHTINGS

1. Asset items:

The following weightings shall be applied to the various categories of asset items:

a) Zero weighting:

    (1) cash in hand and cash equivalent items;

    (2) asset items constituting claims on Zone A central governments and central banks;

    (3) asset items constituting claims on the European Communities;

    (4) asset items constituting claims carrying the explicit guarantees of Zone A central governments and central banks or of the European Communities;

    (5) asset items constituting claims on Zone B central governments and central banks, denominated and funded in the national currencies of the borrowers;

    (6) asset items constituting claims carrying the explicit guarantees of Zone B central governments and central banks, denominated and funded in the national currency common to the guarantor and the borrower;

    (7) asset items secured, to the satisfaction of the competent authorities, by collateral in the form of Zone A central government or central bank securities, or securities issued by the European Communities, or

by cash deposits placed with the lending institution or by certificates of deposits or similar instruments issued by and lodged with the latter.

b) 20% weighting:

    (1) asset items constituting claims on the European Investment Bank (EIB);

    (2) asset items constituting claims on multilateral development banks;

    (3) asset items constituting claims carrying the explicit guarantee of the European Investment Bank (EIB);

    (4) asset items constituting claims carrying the explicit guarantee of multilateral development banks;

    (5) asset items constituting claims on Greek local authorities or secured, to the satisfaction of the Bank of Greece, by collateral in the form of securities issued by Greek local authorities, and claims on Zone A regional governments or local authorities, without prejudice to the provisions of Section seven below;.

    (6) asset items constituting claims carrying the explicit guarantee, including collateral in the form of securities, of Greek local authorities and Zone A regional governments or local authorities, without prejudice to the provisions of Section seven below;.

    (7) asset items constituting claims on Zone A

credit institutions but constituting neither such institutions' own funds as defined in Bank of Greece Governor's Act 2053/18 March 1992, as amended, for credit institutions authorised in Greece, nor own funds in accordance with the relevant EU legislation for credit institutions established in Zone A;

(8) asset items constituting claims, with a maturity of one year or less, on Zone B credit institutions, other than securities issued by such institutions, and recognised as components or their own funds;

(9) asset items carrying the explicit guarantee of Zone A credit institutions;

(10) asset items constituting claims with a maturity of one year or less, carrying the explicit guarantee of Zone B credit institutions;

(11) asset items secured, to the satisfaction of the competent authorities, by collateral in the form of securities issued by the European Investment Bank or other multilateral development banks;

(12) cash items in the process of collection.

c) 50% weighting:

(1) Loans fully and completely secured, to the satisfaction of the competent authorities, by mortgages on residential property which is or will be occupied or let by the borrower;

'Mortgage-backed securities' may be treated as loans referred to herein or in paragraph 4 of Section ten, if the Bank of Greece, having regard to the related legal framework in force in Greece, considers them equivalent to such loans in terms of credit risk. Without prejudice to the types of securities which may qualify or may be approved for inclusion in this point (1), 'mortgage-backed securities' may include instruments within the meaning of Article 2, paragraph 1, point a (i), case aa of Law 2396/1996. In particular, the following conditions must be fulfilled, according to the judgement of the Bank of Greece:

i) such securities are fully and directly backed by a pool of mortgage loans which have the same characteristics as the loans described in this point (1) or in paragraph 1 of Section ten and are fully performing at the time of securitisation;

ii) a mortgage lien, with an acceptably high degree of priority, has been established on the underlying property either directly by investors in mortgage-backed securities or, on their behalf, by a trustee or another authorised agent in proportion to investors' individual holdings in the pool of securities.

(2) Prepayments and accrued income, where a credit institution is unable to determine the risk weighting corresponding to the counterparty.

d) 100% weighting:

(1) asset items constituting claims on Zone B central governments and central banks except when denominated and funded in the national currency of the borrower;

(2) asset items constituting claims on Zone B regional governments or local authorities;

(3) asset items constituting claims with a maturity of more than one year on Zone B credit institutions;

(4) asset items constituting claims on the Zone A or Zone B non-bank sectors;

(5) tangible assets as follows:

    i) land and buildings;

    ii) plant and machinery;

    iii) other fixtures and fittings, tools and equipment;

    iv) prepayments for the above tangible assets and tangible assets in course of construction;

(6) holdings of shares, participations and other components of the own funds of other credit institutions which are not deducted from the own funds of the lending institutions;

(7) A weighting premium of 150% shall apply to the sum of the part of the value of the

following asset items that exceeds 30% of the own funds of credit institutions:

    i) land and buildings,

    ii) participations, forming part of the investment portfolio of credit institutions, in the share capital of undertakings whose main activity is to acquire or manage real estate, as well as in the share capital of undertakings whose main activity is to acquire holdings in the former undertakings, other than partcipations deducted from the own funds of the credit institution.

(8) All other assets except those deducted from own funds.

2. Off-balance-sheet items:

a) The methods set out in Annex II shall be applied to the off-balance-sheet items listed in Annex III, except for:

— contracts traded on recognised exchanges;

— foreign-exchange contracts (except contracts concerning gold) with an initial maturity of up to 14 calendar days.

b) The following treatment shall apply to off-balance-sheet items other than those covered in paragraph a):

    i) They shall first be grouped according to the risk groupings set out in Annex I. The full value of the full-risk items, 50% of the value of the medium-

risk items and 20% of the medium/low-risk items, including the portion of unpaid capital subscribed to the European Investment Fund, shall be taken into account, while the value of low-risk items shall be set at zero.

ii) The second stage shall be to multiply the off-balance-sheet values, adjusted as described above, by the weightings attributable to the relevant counterparties, in accordance with the treatment of asset items prescribed in paragraph 1 of this section and in Section seven. In the case of asset sale and repurchase agreements and outright forward purchases, the weightings shall be those attaching to the assets in question and not to the counterparties to the transactions.

c) Where off-balance-sheet items carry explicit guarantees, they shall be weighted as if they had been incurred on behalf of the guarantor rather than the counterparty. Where the potential exposure arising from off-balance-sheet transactions is fully and completely secured, to the satisfaction of the competent authorities, by any of the asset items recognised as collateral in Section six, paragraph 1 point a), number (7) and point b) number (11), weightings of 0% or 20% shall apply, depending on the collateral in question. A 50% weighting shall apply to off-balance-sheet items which are sureties or guarantees having the character of credit substitutes and which are fully guaranteed, to the satisfaction of the Bank of Greece, by mortgages meeting the terms set out in point c(1) of

paragraph 1 of Section six, subject to the guarantor having a direct right to the encumbered property.

d) Where asset and off-balance-sheet items are given a lower weighting because of the existence of explicit guarantees or collateral acceptable by the competent authorities, the lower weighting shall apply only to that part which is guaranteed or which is fully covered by the collateral.

SECTION SEVEN: SPECIAL PROVISIONS

1. Credit institutions authorised in Greece shall apply a zero weighting on their asset items and off-balance-sheet items which constitute claims on regional governments or local authorities of other EU Member States, or claims either secured, to the satisfaction of the Bank of Greece, by collateral in the form of securities issued by regional governments or local authorities of other EU Member States or guaranteed thereby, provided that those Member States apply a zero weighting to such items.

2. The Bank of Greece may change the weightings referred to in points b(5) and b(6) of Section six, notifying the Commission of the European Communities accordingly.

SECTION EIGHT: COLLATERAL IN THE FORM OF SECURITIES ISSUED BY LOCAL AUTHORITIES

1. Without prejudice to paragraph 1 of Section seven, a weighting of 20% shall apply to asset items which are secured, to the satisfaction of

the Bank of Greece, either by collateral in the form of securities issued by Zone A regional governments or local authorities or by deposits placed with Zone A credit institutions other than the lending institution, or by certificates of deposit or similar instruments issued by such credit institutions.

2. The Bank of Greece shall notify the Commission of the European Communities of any provisions adopted pursuant to paragraph 1.

SECTION NINE: SOLVENCY RATIO LEVEL

1. With effect from 1 January 1993, credit institutions shall be required permanently to maintain the ratio defined in Section three at a level of at least 8%. The Bank of Greece may prescribe higher minimum ratios, pursuant to the relevant provision of Law 2076/1992, Article 18, paragraph 1a, as amended.

2. If the ratio falls below 8%, the Bank of Greece shall ensure that the credit institution in question takes appropriate measures to restore the ratio to the agreed minimum as quickly as possible.

3. The Bank of Greece may, on an individual basis, exempt certain credit institutions from the obligation to calculate the solvency ratio, in accordance with paragraph 3 of Section three.

4. The Bank of Greece, in the context of its responsibility to supervise the maintenance of the minimum agreed solvency ratio by credit institutions, shall ensure that the parent undertaking takes all the necessary measures for the appropriate allocation of capital within the group.

SECTION TEN: TRANSITIONAL PROVISIONS

1. a) Until 31 December 2006, credit institutions may apply a 50% weighting to loans which are entirely and completely secured, to the satisfaction of the Bank of Greece, by mortgages on offices or on multi-purpose commercial premises located within the territory of Greece or of other EU Member States that allow a 50% weighting for such loans, subject to the following conditions:

i) a 50% weighting applies to the part of the loan that does not exceed 50% of the market value of the property in question.

For the purpose of this Act, 'market value of office or of multi-purpose commercial premise' shall mean the price at which the property could be sold under private contract between a willing seller and an arm's-length buyer on the date of valuation, it being assumed that the property is publicly exposed to the market, that market conditions permit orderly disposal and that a reasonable period, with regard to the nature of the property, is available for the negotiation of the sale.

The market value of the property must be calculated by two different and independent (from the borrower and from the lending credit institution) valuers, making separate assessments at the time when the loan agreement is concluded. Specifically:

— If the office or the multi-purpose commercial premise is located in an area

which is subject to the system of "objective prices" established by the Ministry of Economy and Finance of the Hellenic Republic for the derivation of real estate values for taxation purposes, one of the two valuations of the market value of the property must be the value calculated on the basis of those prices.

— The part of the loan to carry the 50% weighting shall be determined on the basis of the lower of the two valuations.

— The property shall be revalued at least every twelve months or, for loans exceeding neither €1 million nor 5% of the own funds of the credit institution, every three years. If the property is located in an area that is subject to the system of "objective prices", no revaluation by an independent valuer shall be required, while in all other cases the revaluation can be made by only one independent valuer.

ii) a 100% risk weighting applies to the part of the loan that exceeds the limits set out in (i);

iii) the property is either used or let by the owner.

b) *

c) For the loans that will have been granted before 31 December 2006, the 50% risk weighting remains applicable until their maturity, if the credit institution is bound to observe the contractual terms.

2. A 50% weighting shall apply to property leasing transactions concluded before 31 December 2006 and concerning assets for business use located in the country of the head office of the institution and governed by legal provisions whereby the lessor retains full ownership of the rented asset until the tenant exercises his option to purchase.

SECTION ELEVEN: OTHER PROVISIONS

1. For credit institutions established in Greece, the operations referred to in the Annexes may be conducted to the extent that they are permitted in accordance with the relevant Greek legislation in force. The same shall apply to the case of paragraph 2 of Section ten.

2. Without prejudice to paragraph 1 of Section ten, capital requirements for credit risk shall be determined by the provisions of this Act.

3. a) Regarding reporting requirements, the provisions of Bank of Greece Governor's Act 1313/9 June 1998, as amended, shall apply (latest amendment by the provisions of Section E, paragraph 3, of Bank of Greece Governor's Act 2494/27 May 2002).

b) In reporting under paragraph (a) above, credit institutions shall report separately the

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* The provisions of paragraph b), which read as follows: "If the 50% risk weighting is already applied on loans granted before 4 October 2001, the conditions laid down in (i), (ii) and (iii) shall be immediately fulfilled, with the exception of the provisions regarding the previously described procedure of valuation of the market value of offices or of multi-purpose commercial premises, the application of which shall have been concluded by 4 October 2002 at the latest", are no longer applicable.

items referred to in paragraph 1(d), point (7), of Section six.

4. With effect from the publication of this Act, the provisions of Bank of Greece Governor's Acts 2054/18 March 1992, 2349/15 February 1995, 2387/6 May 1996, 2409/27 March 1997, 2479/27 August 2001, as well as the provisions of paragraphs 2, 3 and 5 of Bank of Greece Governor's Act 2512/30 December 2002 shall be repealed. References to the Acts repealed as above shall be construed as references to the present Act, being a codification of the former.

The Bank of Greece Department for the Supervision of Credit and Financial Institutions is hereby authorised to provide any further instructions and information relating to the application hereof.

5. Annexes I, II and III shall form an integral part of this Act.

* * *

R e: Codification and supplementation of the Monetary and Credit Committee Decision 485/8/7 October 1991, as applicable, regarding the banks' debtor reporting to the Bank of Greece on a semi-annual basis (Banking and Credit Committee Decision 159/6/26 September 2003)

The Banking and Credit Committee, having regard to:

a) Monetary and Credit Committee Decision 485/8/7 October 1991, as applicable (last amended by Bank of Greece Governor's Act 2523/2003), regarding the banks' debtor

reporting to the Bank of Greece on a semi-annual basis;

b) the advisability of codifying the above provisions into a single text and treating on a consolidated basis the said reporting requirement;

has decided:

to codify and supplement as follows the Monetary and Credit Committee Decision 485/8/7 October 1991, as applicable:

1. a) Credit institutions operating in Greece and branches of credit institutions established abroad shall report to the Bank of Greece, on a semi-annual basis, their debtors (natural and/or legal persons) whose total outstanding balance exceeds, per debtor, one million five hundred thousand euro (€1,500,000).

   b) The following debtors shall be excluded from the reporting requirement;

   — central government;

   — credit institutions;

   — legal persons operating exclusively abroad, provided they are not members of a group of companies established in Greece;

   — natural persons-non residents of Greece.

2. In order to determine whether a debtor is in excess of the above ceiling (€1,500,000), the sum total of each debtor's liabilities towards the credit

institution shall be taken into consideration. Such total shall include any borrowing, letters of guarantee in effect, liabilities stemming from leasing and factoring contracts, debt securities, financial derivatives as well as any other off-balance sheet items.

3. Even if a debtor reduces his/her outstanding debt below the said ceiling after the first report, he/she shall not be removed from the relevant list, unless his/her overall debt, calculated as above, falls below the amount of three hundred thousand euro (€300,000).

4. The above data shall be reported on a consolidated basis within two (2) months from the end of every calendar six-month period. Particularly with respect to 31 December 2003 data, the deadline for the report shall be the 31st March 2004.

5. The Bank of Greece Department for the Supervision of Credit and Financial Institutions is hereby authorised to provide clarifications and instructions regarding the compilation and submission of the above reports.

6. The following shall be hereby abolished:

a) Monetary and Credit Committee Decision 485/8/7 October 1991, as amended by:

i) Monetary and Credit Committee Decision 540/14/17 March 1994,

ii) paragraph 1 of Section VI of Bank of Greece Governor's Act 2485/31 January 2002, and

iii) Section C of Bank of Greece Governor's Act 2523/2003; any reference to the said

Decision shall henceforth be considered to refer to the present Decision.

b) Tables C4, C4a, C5, C5a and C6 of Bank of Greece Governor's Act 1313/9 June 1988, as applicable.

* * *

R e: Codification and supplementation of Bank of Greece Governor's Act 1379/24 October 1988, as applicable, regarding the requirements for granting authorisation to a credit institution in Greece (Bank of Greece Governor's Act 2526/8 December 2003)

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

a) Article 55A of the Statute of the Bank of Greece;

b) Article 1 of Law 1266/1982 "Authorities responsible for the conduct of monetary, credit and exchange rate policies, and other provisions";

c) Law 1665/1951 "Banking operations and supervision", as applicable;

d) Law 2076/1992 "Taking up and pursuit of the business of credit institutions, and other related provisions", as applicable;

e) Bank of Greece Governor's Act 2471/10 April 2001 "Specifying the minimum initial capital of credit institutions";

f) Bank of Greece Governor's Act 1379/1988, as applicable, regarding the requirements for

granting authorisation to a credit institution in Greece;

g) the need to codify into a single text the procedure for granting authorisation to credit institutions in Greece, as specified by Law 2076/1992 and Bank of Greece Governor's Act 1379/24 October 1998, as applicable, without prejudice to Law 2076/1992 being applicable where appropriate;

has decided:

to codify and supplement as follows Bank of Greece Governor's Act 1379/24 October 1988, as applicable.

A. ESTABLISHMENT OF A CREDIT INSTITUTION IN GREECE

In order for the Bank of Greece to authorise the establishment and operation of a credit institution (as defined in Article 2, paragraph 1 (a), of Law 2076/1992, as applicable) in Greece, in the form of a société anonyme or a pure credit cooperative under Law 1667/1986, as applicable, the following procedure shall be followed:

1. The credit institution under establishment shall deposit in cash with the Bank of Greece the total amount of the initial capital required under Bank of Greece Governor's Act 2471/10 April 2001, as applicable, before the Bank of Greece communicates the decision granting authorisation. This amount shall remain in deposit until the legal entity of the credit institution has been officially established.

2. The credit institution shall submit an application

to the Bank of Greece containing the following particulars along with the required supporting documents:

a) Identification of the natural or legal persons which hold, directly or indirectly, at least 10% of the capital or voting rights of the credit institution, or, when these shareholders are less than ten, identification of the ten (10) biggest shareholders. In the case of shareholders that are legal entities, the Bank of Greece may require identification of the natural persons who directly or indirectly are in control of such legal entities; at the same time, the credit institution shall undertake the obligation to notify the Bank of Greece promptly of any subsequent changes of the said natural persons.

In assessing applications for authorisation, the Bank of Greece shall take favourably into account the dispersion of the credit institution's shares, ensuring also in that case effective supervision in respect of the credit institution's sound and prudent management.

The biggest shareholders and the persons who directly or indirectly are in control of shareholder legal entities shall be determined in accordance with Article 2, paragraphs 9 and 10, of Law 2076/1992, as applicable, and Articles 7 and 8 of Presidential Decree 51/1992, as applicable.

b) In respect of the biggest shareholders, the following additional documents shall be submitted:

i) A questionnaire available from the Bank of Greece Department for the Supervision

of Credit and Financial Institutions (Form A for natural persons, Form B for legal entities), duly filled in and signed.

ii) Copy of type A criminal record (for shareholders that are natural persons).

iii) Non-bankruptcy certificate.

c) Declaration of the shareholders holding more than 5%, stating the sources of the funds with which they will acquire their shares, as specified by current legislation (Article 40 of Law 1806/1988). This declaration shall be accompanied by certified copies of the last three years' income tax returns and the respective tax payment notifications. In the event of lawful exemption from the obligation to submit income tax returns or if the funds to be used for the acquisition of the shares constitute income that was lawfully not included in the income tax returns, the concerned parties shall provide other equivalent proof, as judged by the Bank of Greece, of the origin of these funds.

d) Identification of two persons (of which one shall be a Board of Directors member) who shall be working exclusively at the credit institution and shall be responsible for defining its scope of activity.

e) Identification of the person in charge of the Internal Audit Unit, in accordance with the Banking and Credit Committee Decision 154/9/18 July 2003; and

f) Identification of a person responsible for

the credit institution's compliance with anti-money laundering legislation (Article 4, paragraph 10, of Law 2331/1995, as applicable).

For the persons referred to in indents d,e,f, who shall be working exclusively at the credit institution, the following documents shall be submitted to the Bank of Greece before the credit institution's start of operation, as evidence of their reliability and suitability for their tasks so as to ensure the sound and prudent management of the credit institution, pursuant to Law 2076/1992, as applicable:

i) the supporting documents referred to in paragraph 2 (b) above;

ii) complete curricula vitae with information on the above persons' professional background and previous experience in equivalent positions in the financial sector;

iii) two letters of recommendation for each person; these letters must not come from shareholders, prospective Board members or executives of the credit institution to be established or its affiliated undertakings, within the meaning of Article 42e of Law 2190/1920, as applicable.

In exceptional circumstances, if, at the time when the application is submitted to the Bank of Greece, it is impossible to identify the persons referred to in indents (e) and (f) of paragraph 2 hereinabove, the Bank of Greece may grant authorisation conditional upon the fulfilment of this requirement prior to the

incorporation of the credit institution and subject to the approval of the Bank of Greece Department for the Supervision of Credit and Financial Institutions.

g) Identification of the Board of Directors members, distinguishing between executive and non-executive members, along with the supporting documents referred to in paragraph 2(b), indents (ii) and (iii), and paragraph 2(f), indent (ii), for each member. In assessing the application, the Bank of Greece shall evaluate the professional qualifications and experience of the non-executive members of the Board of Directors on issues of internal audit and accounting procedures, in accordance with Bank of Greece Governor's Act 2438/6 August 1998, as amended by Banking and Credit Committee Decision 154/9/18 July 2003.

h) Draft Articles of Association.

i) A feasibility study, containing full and detailed description of the business, broken down by type of activity and by type of investment services, within the meaning of Law 2396/1996, as applicable, to be offered by the credit institution, as well as its business plan for the first three (3) years of operation. The study shall be based on a research of the Greek financial market, shall take into account the financial integration process within the European Economic Area and shall refer to the geographical area and the customer group to be targeted by the credit institution. The feasibility study shall also include:

i) Identification of the sources of financing and forecasts on the development

of balance sheet and profit & loss account key items and of cash flows.

ii) Data on the expected path of the capital adequacy ratio during the first three (3) years of the credit institution's operation, under Bank of Greece Governor's Acts 2524/2003 and 2397/1996, as applicable, specifying the methods used for the assessment of credit, market and operational risks.

iii) Detailed organisational and administrative structure of the credit institution, accompanied by its organisation charts, specifically indicating the composition, and the position within these charts, of the Committees for internal audit and risk management (Bank of Greece Governor's Act 2438/1998, as applicable); also the number and qualifications of the personnel staffing the institution's units as well as the selection criteria for any external collaborators to which the credit institution will outsource the promotion of its products and services.

iv) Description of the marketing methods that will be applied to the credit institution's products.

v) Description of the accounting system and auditing procedures.

vi) Description of IT systems (hardware, software, network infrastructure) and of the method for interoperability with third parties' IT systems, with special emphasis on the mechanisms ensuring

safe and continuous operation; also, description of the credit institution's management information system.

vii) The Policy for the Security of IT Systems.

viii) The internal rules of the credit institution specifying the methods for rating and classifying the credit standing of customers, as well as the procedures to be applied for the control of the institution's branches abroad and subsidiaries, in accordance with the provisions on internal audit systems (Bank of Greece Governor's Act 2438/1998 and Law 2331/1995, as applicable) and the related circulars of the Bank of Greece.

3. The Bank of Greece shall reserve the right to request additional information and data for granting the authorisation.

In the event that any data or information provided in compliance with this Act are inaccurate or misleading, the Bank of Greece shall reserve the right to revoke authorisation, in accordance with Article 8 of Law 2076/1992, as applicable.

4. The information referred to in paragraph 2, indents (a) to (g) above, shall also be submitted during the operation of the credit institution in the case of prospective shareholders of a qualifying holding, as defined in Article 17 of Law 2076/1992, as applicable, as well as in the event of a change either in the persons responsible for the credit institution's operation, for its internal audit and for the implementation of procedures under Law 2331/95, as applicable, or in the Board of Directors members.

Credit institutions shall inform holders of securities convertible into equity that if, by exercising their relevant right, they acquire a qualifying holding in the share capital or become major shareholders of the credit institution, within the meaning of paragraph 2 (a) of this section, they shall be subject to the requirement to report particulars to the Bank of Greece and to obtain approval thereby, under Article 17 of Law 2076/1992 and this Act.

In the context of its powers stipulated in the second and third indents of Article 17, paragraph 1a, of Law 2076/1996, as applicable, the Bank of Greece may, at any time during the operation of the credit institution, require identification of the natural persons who directly or indirectly control the legal entities which are the credit institution's biggest shareholders, within the meaning of paragraph 2(a) of this section.

B. ESTABLISHMENT OF BRANCHES OF CREDIT INSTITUTIONS HAVING THEIR HEAD OFFICE OUTSIDE THE EEA

The establishment in Greece of branches by credit institutions having their head office in a non-EU country or a country that has not ratified the Agreement on the European Economic Area (EEA) shall be governed by Law 2076/1992 (Article 12) and Bank of Greece Governor's Act 2461/5 April 2000, subject to the following terms and conditions:

1. The credit institution shall submit an application to the Bank of Greece.

2. For establishing up to four branches in Greece, the credit institution shall deposit an initial capital

at least equal to half of the initial capital each time required for establishing a credit institution in Greece in the form of a société anonyme. For more branches, additional capital shall be required, up to the minimum amount stipulated in Bank of Greece Governor's Act 2471/10 April 2001, as applicable, on the establishment of a credit institution in Greece in the form of a société anonyme.

3. The competent authority of the credit institution's home country shall communicate to the Bank of Greece:

a) the registered name of the credit institution and the postal address of its branch in Greece;

b) the particulars referred to in paragraph 2 (f), items (i) and (ii), of Section A above, in respect of:

i) the two persons that will be in charge of the management of the branch; these must be residents of Greece and have adequate professional qualifications and experience;

ii) the person responsible for the credit institution's compliance with Law 2331/1995, as applicable, on the prevention and suppression of money laundering;

c) the branch's organisation chart and its business plan, which shall include, *inter alia*, the types of business that the branch plans to engage in; this business must fall within the scope of the authorisation granted to the credit institution in its home country;

d) information on the deposit guarantee scheme applicable in the institution's home country, if such scheme also covers deposits held with the branch in Greece;

e) the credit institution's own funds and its capital adequacy ratio;

f) its consent to the credit institution's expansion to Greece.

The credit institution shall also report any additional information and data that may be required by the Bank of Greece in order to get an accurate picture, for supervisory purposes, of the credit institution's business (e.g. information regarding its financial soundness, capital adequacy against credit and market risks, compliance with limits on large exposures, adequacy of internal audit systems, etc.).

C. ESTABLISHMENT IN GREECE OF BRANCHES OF CREDIT INSTITUTIONS HAVING THEIR HEAD OFFICE IN THE EEA

A credit institution established and operating in another country within the EEA may operate in Greece, provided that its home supervisory authority has previously communicated to the Bank of Greece the following particulars, in accordance with Article 11 of Law 2076/1992, as applicable:

a) the branch's address wherefrom written information can be obtained;

b) the branch's organisation chart and its business plan, which shall include *inter alia* the types of business that the branch plans to engage in;

c) the names of the persons in charge of the management of the branch;

d) the credit institution's own funds and its capital adequacy ratio;

e) detailed information on the deposit guarantee scheme applicable in the credit institution's home country, if such scheme also covers the deposits held with the branch in Greece.

From the entry into force of this Act, Bank of Greece Governor's Act 1379/1988, as amended by Bank of Greece Governor's Act 1590/21 July 1989 and Monetary and Credit Committee Decisions 474/3/29 May 1991 and 494/2/26 February 1992, shall be repealed and any reference to them shall be construed as reference to this Act.

* * *

R e: Rules for the prudential supervision of electronic money institutions by the Bank of Greece (Bank of Greece Governor's Act 2527/8 December 2003)

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

a) the Statute of the Bank of Greece, in particular Articles 55, paragraph 21, 55A, 55C and 55D thereof;

b) Article 1 of Law 1266/1982 "Authorities responsible for the conduct of monetary, credit and exchange rate policies, and other provisions", in conjunction with Article 12 of Law 2548/1997;

c) Law 2076/1992 "Taking up and pursuit of the business of credit institutions, and other related provisions, as amended by Law 3148/2003 "Committee for the Accounting Standardisation and Auditing, replacement and supplementation of provisions on electronic money institutions";

d) Bank of Greece Governor's Act 2526/8 December 2003 "Codification and supplementation of Bank of Greece Governor's Act 1379/1988, as applicable, regarding the requirements for granting authorisation to a credit institution in Greece" and the Monetary and Credit Committee Decision 505/8/1992 on the assessment criteria applied by the Bank of Greece to the establishment of new units by credit institutions, as applicable;

e) Bank of Greece Governor's Act 2524/2003 "Codification of the provisions of Bank of Greece Governor's Act 2054/18 March 1992, as amended, on the solvency ratio of credit institutions established in Greece";

f) Bank of Greece Governor's Act 2397/1996 "Capital adequacy of credit institutions", as applicable (last amended by Bank of Greece Governor's Act 2494/2002);

g) Bank of Greece Governor's Act 2246/1993 "Supervision and monitoring of credit institutions' large exposures", as applicable;

h) Bank of Greece Governor's Act 1313/1988 on the Bank of Greece reporting requirements on credit institutions, as applicable;

i) Bank of Greece Governor's Act 2438/1998 "Operation principles and evaluation criteria for the Internal Audit Systems of credit institutions and determination of competence for credit institutions' bodies pertaining to the field of Internal Audit", as applicable;

j) Bank of Greece Governor's Act 2501/2002 "Informing credit institutions' customers on the terms and conditions applying to their transactions";

k) Monetary and Credit Committee Decision 595/2/27 June 1997 on imposing sanctions to credit institutions in the event of a delay in submitting supervisory information to the Bank of Greece, as well as Governor's Act 2484/2001 on retaining counterfeit euro banknotes and coins;

l) Monetary Policy Council Act 50/31 July 2002 "Determining a framework for the supervision of payment systems";

m) the need to further specify the supervision of electronic money institutions, on the basis of the relevant authorisation under Law 3148/2003;

has decided that:

I. Bank of Greece terms and conditions for granting authorisation to an electronic money institution

1. Electronic Money Institutions, as defined in Article 2, paragraph 16, of Law 2076/1992, as applicable, shall, prior to their start of operation, apply to the Bank of Greece for authorisation, complying with the procedure described in

Section A of Bank of Greece Governor's Act 2526/8 December 2003;

2. The supporting documents and the feasibility study accompanying the (pertinent to the aforementioned general provisions) application shall also specify the following:

a) the type of the electronic device where the monetary value of the electronic money will be stored (e.g. a microchip embedded in a card or a computer memory);

b) the procedures and means for the operation of the issuance-distribution-management of the electronic money scheme;

c) the maximum storage capacity per electronic device;

d) the conditions of, and the threshold for, redemption;

e) the anticipated, during the first three (3) years from the Electronic Money Institution's start of operation, performance of the six-month average balance of its total financial liabilities related to outstanding electronic money.

II. Prudential supervision rules applicable to Electronic Money Institutions

A. Acquisition of qualifying holdings

1. Electronic Money Institutions shall obtain relevant permission by the Bank of Greece prior to:

a) acquiring for the first time a "qualifying holding", within the meaning of Article 2, para-

graph 10, of Law 2076/1992, as applicable, in the share capital of an undertaking conducting operational or other ancillary business related to electronic money issued or distributed by the particular Electronic Money Institution, if the value of this holding exceeds 2% of the Electronic Money Institution's own funds as recorded at the end of the preceding calendar six-month period;

b) increasing an existing "qualifying holding", approved as above, if the cumulative value of this increase within each calendar year exceeds 5% of the Electronic Money Institution's own funds as recorded at the end of the preceding calendar six-month period.

2. Electronic Money Institutions shall communicate to the Bank of Greece (Department for the Supervision of Credit and Financial Institutions) any increases in qualifying holdings for which no prior permission is required, as per the above paragraph, within ten days from the acquisition of such increased holdings.

B. Own funds

For the implementation of Law 2076/1992, as applicable, and the provisions herein, own funds shall be considered as those defined in Bank of Greece Governor's Act 2053/18 March 1992, as applicable, with the following adjustment:

With respect to the additional items (Tier 2) referred to in Section C, Chapter I, of the above mentioned Act, fixed-term cumulative preferential shares and fixed-term subordinated loans as defined in indents (i) and (ii) of paragraph 4 thereof shall not be taken into consideration.

C. Rules on investments

1. Electronic Money Institutions, in order to conform to the obligation derived from Article 20c, paragraph 1, of Law 2076/1992, as applicable, shall invest exclusively in the following highly liquid assets an amount at least equal to their financial liabilities related to outstanding electronic money:

a) Cash in hand and cash equivalent items, as well as asset items constituting claims on Zone A central governments and central banks and on the European Communities or claims carrying the explicit guarantee of Zone A central governments and central banks or of the European Communities and a 0% credit risk weighting, in accordance with Section 6, paragraph 1(a), items 1 to 4 of Bank of Greece Governor's Act 2524/23 July 2003;

b) Sight deposits held with Zone A credit institutions, attracting a 20% weighting, in accordance with Section 6, paragraph 1(b) of the aforementioned Act;

c) Negotiable debt instruments recognised as "qualifying items" with a 20% risk weighting, according to indent (d) of Section D, Chapter A.I of Annex I to Bank of Greece Governor's Act 2397/1996, as amended and partly supplemented with Annex II to Bank of Greece Governor's Act 2494/27 May 2002, provided that:

i) they are not issued by undertakings having a qualifying holding in the Electronic Money Institution, within the meaning of Article 2, paragraph 10, of Law 2076/1992, as applicable, or by undertakings included

in the consolidated financial accounts of the former undertakings, in accordance with applicable law;

ii) they are not subordinated securities included in credit institutions' own funds.

2. To ensure sufficient liquidity throughout the operation of the Electronic Money Institution, apart from the obligation stipulated in paragraph 1 above, an amount of at least 20% of the sum of the Institution's total financial liabilities related to outstanding electronic money plus any other outstanding liabilities shall be covered by the Institution's holdings of sight deposits as referred to in paragraph 1, indent (b) above and of securities eligible as collateral for the conduct of the Eurosystem's monetary policy operations.

3. The Bank of Greece reserves the right to amend the rules on Electronic Money Institutions' investments.

4. Without prejudice to the provisions of Article 20c, paragraph 5, of Law 2076/1992, as applicable, on valuation, it is hereby specified that in particular for the calculation of the general position risk and the exchange rate risk, as provided in indents (c) and (d), paragraph 2, Section D of this Chapter, the current market value plus any accrued interest shall be used.

D. Hedging risk arising from investments made by Electronic Money Institutions

1. Large exposures

With respect to Electronic Money Institutions' asset and off-balance sheet items, the provisions of Bank

of Greece Governor's Act 2246/1993, as applicable, shall apply with the following exceptions:

a) Indent (c), paragraph 4, of Bank of Greece Governor's Act 2397/1996, as applicable, whereby any excess of limits that arises exclusively from trading book items is allowed, shall not apply.

b) No exposures shall be allowed to natural or legal persons which either have a qualifying holding (within the meaning of Article 2, paragraph 10, of Law 2076/1992, as applicable) in the Electronic Money Institution or are among its five (5) biggest shareholders, or to undertakings controlled by such persons.

2. Hedging market risks

For the implementation of Article 20c, paragraph 3, of Law 2076/1992, as applicable, Electronic Money Institutions:

a) may use interest-rate- and foreign-exchange-related financial derivatives which are tradable in the stock exchanges located in the European Economic Area, the USA, Canada, Japan, Australia or Switzerland and which are subject to daily margin requirements. They may also use OTC foreign-exchange forwards with an original maturity of 14 calendar days, provided that the counterparty is a Zone A credit institution;

b) shall calculate the exchange rate risk in all their activities according to the instructions included in Section B, Annex I, of Bank of Greece Governor's Act 2397/1996, as applicable;

c) shall assess their general position risk by currency, in accordance with Table 2A of Annex II of Bank of Greece Governor's Act 2397/1996, as applicable, for their entire portfolio of negotiable debt securities, including their positions in derivatives instruments;

d) shall submit for assessment to the Bank of Greece (Department for the Supervision of Credit and Financial Institutions) the methods of market risk calculation and hedging they apply.

The sum total of the above calculations (paragraphs b to d above) shall be deducted from the Electronic Money Institution's own funds, as calculated according to Section B of this Chapter.

E. Rules for the Electronic Money Institutions' internal audit

1. Electronic Money Institutions shall have an internal audit system ensuring the effective and safe operation of electronic money applications, as provided for in Bank of Greece Governor's Act 2438/1998, as applicable.

2. The provisions of Monetary Policy Council Act 50/31 July 2002 "Payment systems oversight" shall also apply to "electronic money schemes".

F. Reporting to the Bank of Greece

1. Electronic Money Institutions shall report to the Bank of Greece (Department for the Supervision of Credit and Financial Institutions) on:

a) the total amount of their own funds;

b) the total amount of their financial liabilities related to outstanding electronic money;

c) the average balance, for the preceding calendar six-month period, of their financial liabilities related to outstanding electronic money;

d) data related to the general risk from positions in negotiable debt instruments referred to in indents (a) and (c), paragraph 1, of Section IIC hereof and in derivatives instruments, by filling in Table 2A of Annex II of Bank of Greece Governor's Act 2397/1996, as applicable. An appendix to this table shall quote the issuer of the instruments, along with their book and market values.

e) data referring to their foreign-exchange exposure, by submitting the relevant tables contained in Bank of Greece Governor's Act 2291/1194, according to the instructions set out in Section B of Annex I of Bank of Greece Governor's Act 2397/1996, as amended and supplemented with Section B of Annex I of Bank of Greece Governor's Act 2494/2002.

2. The above mentioned data shall be submitted to the Bank of Greece (Department for the Supervision of Credit and Financial Institutions) within the deadlines stipulated in Bank of Greece Governor's Act 2494/27 May 2002, as applicable.

3. Electronic Money Institutions shall also report to the Bank of Greece other data from their financial statements, according to the specific instructions of the Department for the Supervision of Credit and Financial Institutions.

III. Waiver

1. The Bank of Greece may, by means of an *ad hoc* decision, waive the application of the provisions of Law 2076/1992, as applicable, and of this Act to an Electronic Money Institution, if it deems that the waiver criteria stipulated in Article 20, paragraphs 1 and 2, of the aforementioned law are met. In any event, this waiver shall be without prejudice to paragraphs 16 and 17 of Article 2 "Definitions", paragraphs 1,2,4 and 5 of Article 4a "Restrictions on electronic money issuance", Article 4b "Redeemability", paragraph 1 of Article 20a "Terms and conditions for the establishment and operation of electronic money institutions", Article 20e "Verification of conformity to the obligations of electronic money institutions" and paragraph 3 of Article 20f "Waiver" of the above mentioned law.

2. The application for granting a waiver to an Electronic Money Institution shall be submitted to the Bank of Greece along with the following particulars:

a) Any business activity that the Electronic Money Institution is engaged in, other than electronic money issuance;

b) List with the undertakings affiliated, within the meaning of Article 42e, paragraph 5, of Law 2190/1920, as applicable, to the Electronic Money Institution, wherein the type of affiliation and the business scope of these undertakings shall be detailed. The list shall also contain separately any affiliated undertakings conducting operational or other ancillary business related to electronic money issued by the Electronic Money Institution;

c) List with the undertakings that accept the electronic money issued by the Electronic Money Institution as a means of payment but do not fall under the above mentioned categories (a) and (b) The list shall also indicate the location of such undertakings, as well as any existing financial or business relationship between them and the Electronic Money Institution-issuer.

d) The particulars set out in paragraph 2, Section I, hereof.

3. Any Electronic Money Institution to which a waiver was granted according to this section shall:

a) Notify the Bank of Greece immediately on any changes in the information submitted as per paragraph 2 of this section.

b) Submit to the Bank of Greece, at the latest within three months from the end of the first and the second calendar six-month periods of each year, a report on the total amount of its financial liabilities related to outstanding electronic money (as on 31 December and 30 June).

c) If the amount of the Electronic Money Institution's financial liabilities related to outstanding electronic money exceeds:

i) the ceiling of three million euro (€3,000,000) for a period of 20 days within each calendar year or the ceiling of four million euro (€4,000,000) for one working day (in the event that the Institution has been granted a waiver according to the provisions of Article 20f,

paragraph 1(a), of Law 2076/1992, as applicable) or

ii) the ceiling of eight million euro (€8,000,000) for one working day (in the event that the institution has been granted a waiver according to the provisions of Article 20f, paragraphs 1(b) or 1(c), of Law 2076/1992, as applicable),

the waiver shall be revoked and the institution which had been granted a waiver shall thereafter be governed by all the provisions applicable to the authorisation of Electronic Money Institutions.

IV. Establishment in Greece of branches of Electronic Money Institutions having their head office outside the EEA

1. In order for an Electronic Money Institution having its head office outside the EEA to obtain authorisation to establish a branch, the initial capital invested shall be at least equal to the capital required for the establishment of an Electronic Money Institution in Greece (currently amounting to €3,000,000).

2. Bank of Greece Governor's Act 2461/2000, as applicable, shall apply by analogy to the calculation of own funds and to compliance with prudential supervision rules, as established by Law 2076/1992, as applicable, and this Act.

V. Other provisions

1. Electronic Money Institutions shall also be subject to the provisions of Bank of Greece Governor's Acts 2501/2002 and 2484/2001, Monetary and Credit Committee Decision 505/8/1992, as applicable, regarding the establishment of new branches abroad, and Monetary and Credit Committee Decision 595/2/1997, as well as Presidential Decree 384/1992 on the Chart of Accounts for the Banking Sector.

2. The Monetary Policy and Banking Department of the Bank of Greece is hereby authorised to provide clarifications and instructions related to the application of this Act.

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
1999	2.6	3.0	2.9	1.7	4.1	2.4	1.8	−1.7
2000	3.2	2.0	2.0	3.4	2.8	1.9	1.4	26.8
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
2001 I	3.3	3.8	3.8	2.9	3.9	1.9	−5.7	3.4
II	3.7	3.6	3.8	3.7	3.7	4.6	7.4	2.4
III	3.8	3.9	4.0	3.9	3.6	6.2	14.0	−4.4
IV	2.7	3.4	3.6	2.2	3.6	7.8	23.7	−18.7
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
2001 Jan.	3.4	3.7	3.7	3.3	3.7	1.9	−4.2	5.8
Feb.	3.5	3.9	3.9	3.3	4.0	1.7	−7.0	6.2
March ..	3.0	3.7	3.9	2.3	4.1	2.1	−5.9	−1.5
Apr.	3.5	3.7	3.9	3.1	4.1	2.5	−4.3	4.9
May	3.6	3.3	3.5	3.8	3.3	4.6	8.1	5.3
June ...	3.9	3.8	3.8	4.0	3.7	6.8	20.8	−2.6
July	3.9	4.1	4.1	4.0	3.9	6.4	16.4	−5.1
Aug. ...	3.8	3.9	4.0	4.0	3.6	5.9	11.8	−3.7
Sept. ...	3.6	3.6	3.8	3.8	3.3	6.4	14.0	−4.3
Oct. ...	2.8	3.5	3.7	2.2	3.7	6.5	14.3	−15.6
Nov. ...	2.4	3.6	3.8	1.4	3.9	6.8	17.1	−22.1
Dec. ...	3.0	3.1	3.3	2.9	3.3	10.1	39.6	−18.3
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. ...	...	...	...	...	...	...	...	...
Nov. ...	...	...	...	...	...	...	...	...
Dec. ...	3.1	3.4	3.3	2.2	4.5	3.0	3.2	−1.4

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

Table I.2

Wholesale price index

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

Period	General index	Sub-indices		Exported products (primary and industrial)	Final imported products
		Final domestic products for home consumption			
		Primary	Industrial		
1999	1.8	2.2	2.8	0.5	0.6
2000	6.6	1.5	5.2	12.3	6.4
2001	2.3	10.0	2.7	0.7	1.9
2002	2.4	11.2	2.6	1.9	0.4
2002 I	4.3	34.7	2.6	2.4	0.6
II	1.7	6.9	2.2	1.2	0.2
III	1.6	4.8	2.4	1.3	0.2
IV	2.0	0.6	3.1	2.7	0.6
2003 I	1.7	−2.5	3.6	1.1	1.5
II	2.2	19.6	1.9	−2.0	0.9
III	2.2	12.2	2.4	0.2	1.0
2001 Jan.	3.2	−5.8	3.8	5.3	4.6
Feb.	3.2	−0.3	4.1	3.3	3.9
March	2.8	0.2	3.6	2.6	3.5
Apr.	3.4	2.6	4.2	4.2	3.0
May	3.5	7.4	4.2	3.1	2.7
June	4.0	17.1	3.6	3.0	2.8
July	3.4	17.1	3.3	2.1	2.6
Aug.	2.1	6.7	3.1	0.4	1.9
Sept.	1.3	13.1	2.2	−2.4	0.9
Oct.	−0.4	17.4	0.3	−5.2	−0.7
Nov.	−0.5	17.9	0.1	−5.1	−1.1
Dec.	1.5	30.8	0.5	−1.7	−0.5
2002 Jan.	5.1	44.4	2.7	2.4	0.8
Feb.	3.6	29.5	2.0	1.9	0.5
March	4.2	30.5	3.0	2.8	0.5
Apr.	3.7	23.3	2.7	2.8	0.4
May	1.2	1.4	2.1	1.2	0.2
June	0.3	−3.4	1.8	−0.3	0.0
July	0.8	−0.7	2.3	0.5	−0.1
Aug.	2.1	9.2	2.5	1.7	0.4
Sept.	1.9	6.0	2.5	1.7	0.4
Oct.	2.4	5.6	3.1	3.2	0.3
Nov.	2.1	4.5	2.9	2.2	0.5
Dec.	1.4	−6.8	3.2	2.7	0.9
2003 Jan.	0.5	−14.2	3.5	1.4	1.4
Feb.	2.6	2.5	4.1	1.9	1.6
March	2.0	4.9	3.0	0.0	1.4
Apr.	1.0	6.5	1.8	−2.2	1.0
May	2.4	28.1	1.7	−3.3	0.9
June	3.1	26.6	2.2	−0.3	1.0
July	2.9	20.9	2.2	0.7	1.2
Aug.	2.2	10.6	2.5	0.7	1.0
Sept.	1.5	5.6	2.5	−0.7	0.9

Source: NSSG.

T a b l e I.3

Industrial production index (1995=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
1999	1.9	−0.9	−6.0	11.9	6.7	−0.9	−1.4	12.0	0.0
2000	7.2	5.1	13.4	11.5	12.3	6.2	7.3	12.7	1.9
2001	1.0	1.8	−1.4	−0.3	−0.3	−1.0	5.1	−1.8	4.1
2002	1.8	1.2	9.1	2.0	2.3	0.8	−5.1	−13.9	5.9
2001 III	2.0	2.3	5.3	0.5	1.1	0.6	−4.1	0.7	6.2
IV	−0.2	−0.4	−8.7	1.9	2.3	−5.9	0.7	−6.0	3.7
2002 I	0.2	−0.7	12.6	0.2	1.8	−1.7	−16.1	−14.7	7.7
II...........	4.0	2.9	10.7	5.8	5.0	3.4	−2.3	−13.7	7.2
III	−0.2	−0.5	0.6	0.6	0.1	−0.2	−1.6	−10.5	0.6
IV	3.1	2.9	14.4	1.6	2.5	1.5	0.2	−16.2	9.0
2003 I	0.1	−1.4	−10.7	6.0	4.6	−0.3	−15.2	−4.5	−0.5
II...........	2.0	0.3	−6.2	8.1	6.0	−1.8	1.0	−5.3	2.3
2000 Oct.	5.9	4.4	21.9	7.0	12.1	4.2	9.7	−2.4	0.9
Nov.........	7.4	6.8	19.5	6.6	5.7	7.5	15.3	8.9	6.6
Dec.........	5.5	5.5	−3.9	7.1	3.9	7.0	8.0	5.2	4.9
2001 Jan..........	4.0	8.7	11.0	−6.0	−6.1	9.6	42.3	13.6	3.8
Feb.	2.9	7.9	0.5	−7.5	−7.7	3.5	45.3	15.6	4.8
March.......	−1.6	−1.1	−2.8	−2.6	−3.6	−1.2	11.4	−2.7	−3.1
Apr.	−1.3	−2.2	−5.1	2.3	0.4	−3.9	−4.8	−9.0	1.9
May	3.1	3.1	−4.2	4.7	3.0	1.6	3.7	0.9	4.9
June	0.2	0.8	−4.5	−0.6	1.2	−3.4	−6.7	−10.4	6.8
July.........	2.7	4.1	3.0	−0.4	0.2	−0.6	2.2	3.8	10.0
Aug.	−0.2	−0.1	1.8	−0.8	0.1	−0.6	−19.8	−3.1	4.0
Sept.........	3.2	2.6	10.2	2.9	3.0	2.7	1.1	−0.1	4.6
Oct.	2.2	1.2	2.7	4.8	5.9	−0.4	−4.2	−0.8	3.4
Nov.........	1.0	2.7	−7.3	−1.4	−0.3	−4.3	−1.5	−6.4	11.2
Dec.........	−4.1	−5.4	−24.4	2.3	1.4	−14.0	7.4	−9.5	−4.1
2002 Jan..........	−1.4	−5.9	9.9	6.8	6.2	−8.3	−30.9	−25.1	8.1
Feb.	−1.0	−0.9	17.0	−4.7	−2.3	1.1	−23.7	−11.1	8.4
March.......	2.9	4.0	10.7	−1.5	1.4	1.4	6.0	−10.3	6.7
Apr.	8.3	9.2	9.0	5.7	5.2	12.9	4.1	−7.1	9.7
May	0.7	−0.4	11.5	1.4	1.0	−2.4	−6.8	−15.7	7.8
June	3.3	0.2	11.6	9.9	8.5	0.7	−4.2	−18.1	4.3
July.........	2.7	0.6	3.7	7.3	5.5	0.5	−3.9	−13.2	4.6
Aug.	−1.6	−2.9	7.7	−0.8	0.2	−1.0	−1.8	−18.3	−3.6
Sept.........	−1.7	0.3	−7.3	−5.6	−5.9	−0.2	1.0	−3.6	0.7
Oct.	−1.2	−0.5	4.9	−4.1	−3.0	−0.6	−3.8	−10.6	2.0
Nov.........	4.0	2.4	15.6	6.1	6.9	−0.8	−2.5	−14.6	9.9
Dec.........	7.0	7.6	28.2	3.0	3.5	7.4	5.8	−22.2	16.5
2003 Jan..........	0.0	5.0	−6.1	−8.9	−7.7	9.9	−8.1	10.3	1.9
Feb.	0.9	−3.9	−16.5	17.3	12.9	−3.8	−19.8	−10.6	−1.5
March.......	−0.6	−4.3	−8.9	11.8	9.8	−5.2	−15.6	−8.0	−1.6
Apr.	−1.3	−4.0	−2.0	6.2	6.5	−6.7	−14.2	−18.9	1.3
May	4.3	1.9	−7.9	13.8	12.0	−0.9	0.9	2.9	2.6
June	3.0	3.1	−8.2	4.8	0.4	2.3	17.4	1.5	3.0
July.........	2.0	1.8	−6.9	4.0	3.3	2.6	0.0	2.2	0.2
Aug.*	−0.3	−5.3	−4.6	10.3	8.9	−4.3	−4.2	−1.6	−8.2

* Provisional data.
Source: NSSG.

T a b l e I.4

Retail sales volume (2000=100)

(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-newspapers-office equipment
1999	1.8	–1.2	5.2	7.7	0.1
2000	8.8	7.4	13.3	11.5	8.3
2001	4.4	2.3	3.3	4.7	5.9
2002	4.5	4.5	2.8	4.4	5.2
2001 II	4.6	3.0	2.5	5.9	6.6
III	3.5	1.2	3.7	0.6	2.5
IV	1.7	–0.4	–0.7	4.8	6.2
2002 I	2.9	–0.7	6.5	7.8	4.0
II	3.7	4.1	–0.7	1.8	7.4
III	5.5	7.6	0.9	5.7	6.3
IV	5.9	7.0	3.9	2.9	3.3
2003 I	6.7	7.7	–3.5	13.7	7.2
II	2.6	1.3	10.5	–1.7	11.5
2001 Apr.	5.5	4.0	2.2	8.0	7.1
May	5.0	3.9	3.2	6.5	5.1
June	3.4	1.1	2.0	3.4	7.4
July	3.9	1.7	4.6	0.0	2.1
Aug.	3.6	0.7	5.5	–0.3	2.4
Sept.	3.0	1.2	0.8	2.2	3.1
Oct.	0.3	–2.6	–1.4	2.7	4.4
Nov.	3.4	1.6	–0.5	6.5	7.3
Dec.	1.5	–0.2	–0.3	5.2	6.8
2002 Jan.	0.3	–3.4	2.0	6.6	3.8
Feb.	3.5	–1.8	10.8	10.0	6.5
March	5.0	3.4	7.2	6.8	1.7
Apr.	–1.9	–4.7	–3.2	1.7	2.2
May	7.9	10.8	2.1	–0.1	12.8
June	5.8	7.7	–0.6	3.6	7.7
July	3.6	4.6	1.6	1.9	7.0
Aug.	4.3	9.7	–8.8	6.7	3.3
Sept.	8.6	8.7	10.0	9.0	8.0
Oct.	5.4	6.4	7.7	0.7	4.1
Nov.	4.8	6.4	3.9	2.2	0.0
Dec.	7.2	7.9	1.5	5.1	5.0
2003 Jan.	8.2	9.6	–4.2	19.8	11.6
Feb.	4.6	7.0	–8.5	10.1	3.5
March	7.3	6.6	5.0	10.8	6.3
Apr.	4.2	4.2	12.3	–8.0	21.2
May	1.8	–0.8	12.3	1.8	8.1
June	1.7	0.3	6.2	1.4	5.3
July	2.1	–0.1	5.5	2.0	3.0
Aug.	11.2	9.1	12.5	6.9	12.6

Sources: NSSG and Eurostat. Revised index of retail sales volume (excluding VAT).

T a b l e I.5

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

	Million euro	Annual percentage change (at constant 1995 prices)					
	1995	1998	1999	2000	2001	2002	2003
1.1 Primary sector (agriculture)	7,277	2.3	3.5	-4.2	-4.1	-1.3	...
1.2 Secondary sector	16,550	7.2	2.4	5.4	5.8	2.8	...
1.2.a Mining and quarrying	476	13.0	−17.9	23.2	2.2	8.6	...
1.2.b Manufacturing	9,572	5.3	1.3	4.6	3.3	3.0	...
1.2.c Electricity - town gas - water supply	1,751	6.8	13.4	4.8	0.3	2.9	...
1.2.d Construction	4,751	10.6	2.3	5.7	13.0	2.0	...
1.3 Tertiary sector	50,031	3.1	2.0	5.1	5.2	4.1	...
1.3.a Trade	10,018	3.6	−0.8	3.1	11.7	1.2	...
1.3.b Hotels - restaurants	4,821	3.7	−5.7	5.4	6.2	4.0	...
1.3.c Transport - communications	4,978	4.1	33.4	16.2	1.3	5.9	...
1.3.d Financial intermediaries	3,112	11.5	11.0	10.0	5.9	−0.3	...
1.3.e Real estate management and other activities	12,577	2.5	−5.9	3.3	3.0	4.0	...
1.3.f Public administration - security	5,308	−0.6	0.9	−2.8	2.3	5.2	...
1.3.g Health	3,298	−0.7	−2.2	1.6	−1.2	9.6	...
1.3.h Education	3,855	1.2	−2.0	3.0	1.0	7.9	...
1.3.i Other activities	2,064	6.5	9.6	7.6	15.2	6.8	...
1.4 Gross value added	73,858	3.9	2.1	4.4	4.6	3.5	...
1.5 Imputed bank services	−2,175	16.5	2.8	13.7	12.1	1.6	...
1.6 Gross value added at basic prices	71,683	3.6	2.1	4.1	4.3	3.6	...
2.1 Final consumption	70,655	3.2	2.4	2.1	2.3	3.2	2.7
2.1.a Private consumption	58,405	3.5	2.5	2.0	2.9	2.8	3.1
2.1.b Public consumption	12,250	1.7	2.1	2.2	−1.0	5.1	0.5
2.2 Gross fixed capital formation	14,867	10.6	11.0	8.0	6.5	5.7	9.7
2.2.a Residential	4,031	8.8	3.7	−4.3	4.8	8.8	6.0
2.2.b Non-residential construction	5,391	9.4	6.6	8.9	8.2	0.7	16.6
2.2.c Equipment	4,680	16.5	21.4	14.1	4.9	6.9	7.0
2.2.d Other investment	765	−14.0	−2.4	7.6	20.1	20.8	3.0
2.3 Stocks and statistical discrepancy (percentage of GDP)	252	0.3	0.0	0.4	0.0	0.1	0.0
2.4 Domestic final demand	85,774	4.6	3.8	3.7	2.9	3.8	4.2
2.5 Exports of goods and services	14,087	5.3	18.1	14.1	−1.1	−7.7	1.9
2.5.a Exports of goods	8,344	2.7	6.3	8.7	−1.6	−7.1	4.6
2.5.b Exports of services	5,743	7.7	29.0	18.2	−0.7	−8.1	0.0
2.6 Final demand	99,861	4.7	6.1	5.6	2.1	1.7	3.8
2.7 Imports of goods and services	19,934	9.2	15.0	8.9	−3.4	−4.7	3.0
2.7.a Imports of goods	18,084	9.4	8.5	7.6	−4.2	1.1	4.0
2.7.b Imports of services	1,849	8.5	52.9	14.4	−0.3	−26.6	−2.0
2.8 GDP at market prices	79,927	3.4	3.4	4.4	4.0	3.8	4.0

Source: NSSG/National Accounts (final data for 1998-1999 and estimates for 2000-2002), September 2003. For 2003, Ministry of Economy and Finance, Updated Stability and Growth Programme (December 2003).

T a b l e II.1

Balance of payments

(Million euro)

	January - October			October		
	2001	2002	2003*	2001	2002	2003*
I CURRENT ACCOUNT BALANCE (I.A+I.B+I.C+I.D)	**−5,729.6**	**−5,497.8**	**−5,805.3**	**−764.1**	**−953.7**	**−786.0**
I.A TRADE BALANCE *(I.A.1– I.A.2)*	***−18,025.1***	***−18,720.7***	***−18,595.0***	***−1,922.0***	***−2,115.2***	***−1,902.2***
Non-oil trade balance	−15,485.3	−15,862.2	−15,282.8	−1,705.6	−1,728.4	−1,583.7
Oil trade balance	−2,539.8	−2,858.5	−3,312.2	−216.4	−386.8	−318.5
I.A.1 *Exports of goods*	9,675.6	8,600.6	9,180.3	961.2	917.7	1,043.8
Oil	1,478.1	928.8	1,113.3	133.5	83.2	103.6
Other	8,197.5	7,671.8	8,067.0	827.8	834.5	940.2
I.A.2 *Imports of goods*	27,700.7	27,321.3	27,775.3	2,883.2	3,032.9	2,946.1
Oil	4,017.9	3,787.3	4,425.5	349.8	470.0	422.1
Other	23,682.8	23,534.0	23,349.8	2,533.4	2,562.9	2,524.0
I.B SERVICES BALANCE *(I.B.1– I.B.2)*	***8,223.3***	***10,215.0***	***10,737.3***	***909.4***	***1,063.7***	***1,107.2***
I.B.1 *Receipts*	19,082.4	18,810.5	18,683.7	2,039.4	1,988.0	2,025.4
Travel	9,466.9	9,794.8	8,988.6	994.7	1,053.9	928.0
Transport	7,709.8	7,075.8	7,766.7	792.5	732.0	834.1
Other	1,905.7	1,939.9	1,928.3	252.1	202.1	263.3
I.B.2 *Payments*	10,859.1	8,595.5	7,946.4	1,130.0	924.3	918.2
Travel	3,937.8	2,078.9	1,698.6	426.2	238.9	227.0
Transport	4,515.5	4,192.8	3,951.1	483.9	425.3	446.9
Other	2,405.8	2,323.8	2,296.7	219.9	260.1	244.3
I.C INCOME ACCOUNT *(I.C.1– I.C.2)*	***−1,631.6***	***−1,735.7***	***−2,306.3***	***−128.8***	***−148.7***	***−200.8***
I.C.1 *Receipts*	1,790.2	1,359.4	1,293.4	163.3	122.3	101.7
Compensation of employees	505.1	442.1	285.8	54.8	37.2	27.7
Interest, dividends, profits	1,285.1	917.3	1,007.5	108.4	85.1	74.1
I.C.2 *Payments*	3,421.8	3,095.2	3,599.7	292.1	271.0	302.5
Compensation of employees	236.6	207.4	135.0	26.1	19.3	15.5
Interest, dividends, profits	3,185.2	2,887.8	3,464.7	266.0	251.7	287.0
I.D TRANSFERS ACCOUNT *(I.D.1– I.D.2)*	***5,703.9***	***4,743.6***	***4,358.8***	***377.3***	***246.4***	***209.8***
I.D.1 *Receipts*	7,588.5	6,736.6	6,305.9	583.6	426.8	336.0
General government (EU transfers)	5,028.8	4,790.5	4,254.3	310.3	195.2	115.6
Other (emigrants' remittances, etc.)	2,559.7	1,946.1	2,051.6	273.3	231.5	220.4
I.D.2 *Payments*	1,884.6	1,993.0	1,947.2	206.3	180.4	126.2
General government	1,202.1	1,455.5	1,500.7	123.3	122.8	77.7
Other	682.5	537.5	446.4	83.0	57.5	48.5
II FINANCIAL ACCOUNT (II.A+II.B+II.C+II.D)	**4,775.2**	**6,983.4**	**6,593.4**	**1,240.8**	**844.2**	**574.4**
II.A DIRECT INVESTMENT [1]	***1,009.3***	***−473.6***	***−272.9***	***2.5***	***−48.6***	***398.6***
By residents abroad	−586.9	−472.4	−444.0	−53.9	−74.1	−10.5
By non-residents in Greece	1,596.1	−1.3	171.0	56.3	25.5	409.1
II.B PORTFOLIO INVESTMENT [1]	***9,994.4***	***9,510.3***	***11,153.9***	***1,742.3***	***−225.8***	***−166.0***
Assets	37.0	−1,292.6	−6,221.6	−373.0	−145.3	567.4
Liabilities	9,957.4	10,802.9	17,375.6	2,115.3	−80.5	−733.3
II.C OTHER INVESTMENT [2]	***−12,038.5***	***−114.3***	***−8,197.6***	***−563.0***	***1,190.6***	***483.7***
Assets	−5,871.9	−6,516.0	−5,379.0	−1,542.4	344.9	−1,791.8
Liabilities	−6,166.6	6,401.7	−2,818.6	979.4	845.7	2,275.5
(General government loans)	−2,279.3	−3,003.8	−2,290.5	97.3	−317.7	−220.9
II.D CHANGE IN RESERVE ASSETS [2]	***5,810.0***	***−1,939.0***	***3,910.0***	***59.0***	***−72.0***	***−142.0***
III ERRORS AND OMISSIONS	**954.4**	**−1,485.6**	**−788.1**	**−476.6**	**109.6**	**211.6**
RESERVE ASSETS [3]				*7,398.0*	*8,970*	*4,962*

1 (+) net inflow, (−) net outflow.

2 (+) decrease, (−) increase.

3 Since Greece entered the euro area in January 2001, reserve assets, as defined by the European Central Bank, include only monetary gold, the "reserve position" in the IMF, the "special drawing rights", and 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
1995	. . . .	66.3	−3.5	−3.5
1996	. . . .	65.5	−1.1	−1.1
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
2001	I	56.1	1.7	−2.4
	II	55.7	−0.8	−1.2
	III	55.8	0.3	−0.1
	IV	55.9	0.2	1.4
2002	I	55.9	0.0	−0.3
	II	56.2	0.5	1.0
	III	56.6	0.7	1.4
	IV	56.8	0.4	1.6
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
2002	Jan.	56.0	0.0	−0.3
	Feb.	55.9	−0.2	−0.2
	March	55.9	0.0	−0.4
	Apr.	55.9	0.1	0.0
	May	56.2	0.4	1.0
	June	56.5	0.6	1.9
	July	56.7	0.3	2.0
	Aug.	56.6	−0.2	1.1
	Sept.	56.6	0.1	1.1
	Oct.	56.7	0.2	1.2
	Nov.	56.8	0.2	1.8
	Dec.	57.0	0.3	1.8
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

* 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. 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:		Japanese yen	Percentage change over:		Danish krone	Percentage change over:		Pound sterling	Percentage change over:	
		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year
1995	1.308			123.0			7.33			0.829		
1996	1.270	−2.9	−2.9	138.1	12.3	12.3	7.36	0.4	0.4	0.814	−1.8	−1.8
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	0.0	0.0	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	0.0	0.0	0.692	10.1	10.1
2001 I	0.923	6.2	−6.5	109.0	14.1	3.2	7.46	0.1	0.2	0.633	5.3	2.9
II	0.873	−5.4	−6.5	107.1	−1.7	7.6	7.46	−0.1	0.0	0.615	−2.8	0.8
III	0.891	2.0	−1.6	108.3	1.1	11.1	7.44	−0.2	−0.2	0.619	0.8	1.1
IV	0.896	0.5	3.0	110.6	2.2	15.8	7.44	0.0	−0.2	0.621	0.2	3.4
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	0.0	−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	0.0	−0.2	0.636	0.2	2.5
2003 I	1.074	7.3	22.5	127.7	4.2	10.1	7.43	0.0	0.0	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	0.0	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
2002 Jan. . . .	0.883	−1.0	−5.9	117.1	3.3	6.9	7.43	−0.1	−0.4	0.61659	−0.6	−2.9
Feb. . . .	0.870	−1.5	−5.6	116.2	−0.8	8.5	7.43	0.0	−0.4	0.61160	−0.8	−3.5
March .	0.876	0.6	−3.7	114.6	−1.4	3.9	7.43	0.0	−0.4	0.61577	0.7	−2.1
Apr. . . .	0.886	1.2	−0.7	115.8	1.0	4.9	7.43	0.0	−0.4	0.61407	−0.3	−1.2
May . . .	0.917	3.5	4.9	115.9	0.0	8.8	7.44	0.0	−0.3	0.62823	2.3	2.4
June . .	0.954	4.1	11.8	117.8	1.6	12.8	7.43	0.0	−0.3	0.64373	2.5	5.6
July . . .	0.992	4.0	15.3	117.11	−0.6	9.2	7.430	0.0	−0.2	0.63870	−0.8	5.0
Aug. . .	0.978	−1.5	8.6	116.31	−0.7	6.4	7.427	0.0	−0.2	0.63633	−0.4	1.5
Sept. . .	0.981	0.3	7.7	118.38	1.8	9.4	7.427	0.0	−0.2	0.63059	−0.9	1.2
Oct. . .	0.981	0.0	8.3	121.57	2.7	10.7	7.430	0.0	−0.1	0.62994	−0.1	1.0
Nov. . .	1.001	2.1	12.7	121.65	0.1	11.9	7.428	0.0	−0.2	0.63709	1.1	3.0
Dec. . .	1.018	1.7	14.1	124.20	2.1	9.5	7.426	0.0	−0.2	0.64218	0.8	3.6
2003 Jan. . . .	1.063	4.4	20.3	126.20	1.6	7.8	7.433	0.1	−0.0	0.65747	2.4	6.6
Feb. . . .	1.077	1.4	23.8	128.60	1.9	10.6	7.432	−0.01	0.0	0.66977	1.9	9.5
March .	1.081	0.3	23.4	128.16	−0.3	11.8	7.427	−0.1	−0.1	0.68255	1.9	10.8
Apr. . . .	1.085	0.4	22.5	130.12	1.5	12.4	7.426	−0.03	−0.1	0.68902	0.9	12.2
May . . .	1.158	6.8	26.3	135.83	4.4	17.2	7.425	−0.01	−0.1	0.71322	3.5	13.5
June . .	1.166	0.7	22.2	138.05	1.6	17.2	7.425	0.01	−0.1	0.70224	−1.5	9.1
July . . .	1.137	−2.5	14.6	134.99	−2.2	15.3	7.433	0.11	0.0	0.70045	−0.3	9.7
Aug. . .	1.114	−2.0	13.9	132.38	−1.9	13.8	7.432	−0.01	0.1	0.69919	−0.2	9.9
Sept. . .	1.122	0.7	14.4	128.94	−2.6	8.9	7.427	−0.07	0.0	0.69693	−0.3	10.5
Oct. . .	1.169	4.2	19.2	128.12	−0.6	5.4	7.430	0.04	0.0	0.69763	0.1	10.7
Nov. . .	1.170	0.1	16.9	127.84	−0.2	5.1	7.437	0.09	0.1	0.69278	−0.7	8.7
Dec. . .	1.229	5.0	20.7	132.43	3.6	6.6	7.442	0.07	0.2	0.70196	1.3	9.3

* 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			Swiss franc			Norwegian krone			Australian dollar			Canadian dollar		
		Percentage change over:			Percentage change over:			Percentage change over:			Percentage change over:			Percentage change over:	
		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year
1995	9.33			1.546			8.29			1.623			1.731		
1996	8.51	−8.8	−8.8	1.568	1.4	1.4	8.20	−1.1	−1.1	1.623			1.731		
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
2001 I	9.00	4.6	5.9	1.533	1.1	−4.6	8.20	2.0	1.1	1.740	6.6	11.3	1.410	6.3	−1.7
II	9.13	1.4	10.3	1.528	−0.3	−2.3	8.01	−2.3	−2.3	1.704	−2.1	7.5	1.346	−4.5	−2.6
III	9.42	3.2	12.1	1.506	−1.4	−2.5	8.01	−0.1	−1.2	1.737	1.9	10.1	1.376	2.2	2.5
IV	9.48	0.6	10.2	1.474	−2.2	−2.8	7.97	−0.5	−0.9	1.749	0.7	7.1	1.415	2.9	6.7
2002 I	9.16	−3.4	1.7	1.473	0.0	−3.9	7.81	−2.0	−4.8	1.692	−3.3	−2.8	1.397	−1.3	−0.9
II	9.16	0.0	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	0.0	−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
2002 Jan. . . .	9.23	−2.2	3.6	1.475	0.0	−3.6	7.921	−0.9	−3.8	1.709	−1.5	1.2	1.413	0.4	0.3
Feb. . . .	9.18	−0.5	2.3	1.477	0.2	−3.8	7.785	−1.7	−5.2	1.696	−0.8	−1.6	1.388	−1.8	−1.0
March .	9.06	−1.3	−0.7	1.468	−0.6	−4.4	7.717	−0.9	−5.4	1.670	−1.5	−7.6	1.390	0.2	−1.9
Apr. . . .	9.14	0.8	0.3	1.466	−0.2	−4.1	7.622	−1.2	−6.1	1.654	−1.0	−7.3	1.401	0.8	0.8
May . . .	9.22	0.9	1.8	1.457	−0.6	−5.0	7.521	−1.3	−5.9	1.666	0.8	−0.9	1.421	1.4	5.5
June . .	9.11	−1.1	−1.0	1.472	1.0	−3.3	7.405	−1.5	−6.7	1.678	0.7	2.0	1.462	2.9	12.3
July . . .	9.269	1.7	0.1	1.462	−0.7	−3.4	7.405	0.0	−7.1	1.792	6.8	6.1	1.532	4.8	16.5
Aug. . .	9.249	−0.2	−0.7	1.464	0.1	−3.4	7.428	0.3	−7.8	1.805	0.7	5.1	1.533	0.1	10.7
Sept. . .	9.168	−0.9	−5.2	1.465	0.1	−1.8	7.362	−0.9	−8.0	1.793	−0.7	−0.6	1.543	0.7	8.2
Oct. . .	9.105	−0.7	−4.9	1.465	0.0	−1.0	7.345	−0.3	−8.2	1.783	−0.5	−0.7	1.548	0.3	8.8
Nov. . .	9.082	−0.3	−3.6	1.467	0.2	0.1	7.319	−0.3	−7.6	1.785	0.1	3.9	1.574	1.6	11.2
Dec. . .	9.096	0.2	−3.6	1.468	0.0	−0.5	7.29	−0.3	−8.7	1.808	1.3	4.2	1.587	0.9	12.8
2003 Jan. . . .	9.177	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. . . .	9.146	−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 .	9.227	0.9	1.8	1.470	0.1	0.1	7.83	4.0	1.7	1.795	−0.9	7.5	1.594	−2.2	14.7
Apr. . . .	9.154	−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 . . .	9.156	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 . .	9.118	−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 . . .	9.186	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. . .	9.238	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. . .	9.068	−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. . .	9.011	−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. . .	8.994	−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. . .	9.023	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

* 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).

Table II.4

General government external debt servicing

(Million euro)

	Year		
	2000	2001	2002
INTEREST	2,180	2,003	1,572
AMORTISATION *of which:*	5,109	2,686	4,443
Loan prepayments	124	–	–
T O T A L	7,289	4,689	6,015

Source: Bank of Greece.

T a b l e III.1

Monetary aggregates of the euro area[1]

(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 (7)	Money market fund units (8)	Money market paper and debt securities with an initial maturity of up to 2 years (9)	M3[2] (10)=(6)+(7)+(8)+(9)
2000	348.4	1,776.7	2,125.1	991.8	1,173.2	4,290.0	174.9	300.0	135.7	4,900.7
2001	239.7	2,022.9	2,262.6	1,088.8	1.316.3	4,667.7	218.5	398.0	145.9	5,430.2
2002	341.2	2,140.9	2,482.0	1,075.5	1,405.9	4,963.6	226.9	470.5	127.7	5,788.7
2001 Jan.[3]	336.1	1,739.8	2,075.9	1,036.1	1,228.1	4,340.1	211.4	327.9	139.0	5,018.3
Feb.	335.0	1,739.9	2,074.9	1,049.0	1,222.7	4,346.6	213.2	336.0	145.5	5,041.3
March ..	336.3	1,750.4	2,086.7	1,065.9	1,222.6	4,375.2	222.6	346.1	139.3	5,083.1
Apr.	336.2	1,783.8	2,120.0	1,067.8	1,225.5	4,413.3	221.4	354.1	140.0	5,128.7
May	332.9	1,807.1	2,140.0	1,069.0	1,225.3	4,434.3	233.8	363.0	135.0	5,166.1
June	333.0	1,847.4	2,180.4	1,066.2	1,234.0	4,480.6	221.5	360.5	145.2	5,207.8
July	328.0	1,829.6	2,157.6	1,073.2	1,237.9	4,468.7	223.4	369.6	140.4	5,202.1
Aug.	319.2	1,797.5	2,116.7	1,088.8	1,242.9	4,448.4	230.8	380.7	142.5	5,202.4
Sept. ...	309.6	1,865.5	2,175.1	1,070.9	1,250.2	4,496.3	225.7	381.2	147.6	5,250.8
Oct.	295.5	1,866.7	2,162.2	1,074.7	1,262.2	4,499.1	235.1	392.3	149.5	5,275.9
Nov.	279.7	1,916.0	2,195.7	1,077.6	1,276.6	4,549.8	225.9	400.8	152.2	5,328.6
Dec.	239.7	2,022.9	2,262.6	1,088.8	1,316.3	4,667.7	218.5	398.0	145.9	5,430.2
2002 Jan.	246.5	1,976.8	2,223.3	1,081.0	1,335.0	4,639.3	216.2	416.6	141.8	5,413.9
Feb.	240.3	1,972.2	2,212.5	1,076.8	1,339.1	4,628.4	221.1	427.0	138.8	5,415.2
March ..	254.3	1,969.1	2,223.4	1,088.5	1,342.8	4,654.7	229.6	431.2	137.2	5,452.8
Apr.	261.7	2,001.1	2,262.8	1,092.1	1,335.8	4,690.7	228.1	437.5	134.7	5,490.9
May	273.8	2,001.2	2,275.0	1,099.6	1,337.8	4,712.4	234.8	442.6	144.0	5,533.8
June	285.7	2,048.4	2,334.1	1,074.9	1,343.2	4,752.2	229.6	439.2	132.8	5,553.8
July	296.6	2,015.9	2,312.4	1,083.7	1,346.2	4,742.3	228.8	450.3	125.5	5,546.9
Aug.	301.1	1,984.6	2,285.7	1,096.9	1,351.6	4,734.2	236.5	463.4	126.5	5,560.7
Sept. ...	306.7	2,042.0	2,348.7	1,073.6	1,353.7	4,776.1	238.3	460.4	131.3	5,606.1
Oct.	313.9	2,024.9	2,338.8	1,093.7	1,361.9	4,794.4	235.6	462.7	133.7	5,626.3
Nov.	321.4	2,076.4	2,397.7	1,086.3	1,374.2	4,858.3	229.6	477.1	131.1	5,696.1
Dec.	341.2	2,140.9	2,482.0	1,075.7	1,405.9	4,963.6	226.9	470.5	127.7	5,788.7
2003 Jan.	312.1	2,104.4	2,416.6	1,077.2	1,429.5	4,923.3	233.0	534.9	109.2	5,800.4
Feb.	319.3	2,107.6	2,426.9	1,079.6	1,443.9	4,950.3	233.8	547.2	109.1	5,840.4
March ..	327.2	2,146.0	2,473.2	1,072.5	1,457.0	5,002.7	224.0	550.8	99.4	5,876.9
Apr.	336.4	2,164.5	2,500.8	1,077.3	1,465.1	5,043.2	230.5	563.0	124.0	5,960.7
May	343.8	2,193.8	2,537.6	1,096.2	1,473.2	5,107.0	231.4	571.1	105.0	6,014.5
June	351.0	2,229.8	2,580.8	1,059.3	1,487.3	5,127.5	214.9	571.0	97.6	6,010.9
July	361.5	2,199.0	2,560.5	1,062.7	1,498.4	5,121.5	220.1	585.5	91.2	6,018.3
Aug.	362.7	2,186.0	2,548.7	1,068.6	1,505.8	5,123.0	217.1	587.7	88.9	6,016.7
Sept. ...	364.9	2,226.0	2,590.9	1,036.9	1,505.9	5,133.7	211.7	577.4	91.4	6,014.2
Oct.	371.3	2,224.6	2,595.9	1,049.1	1,511.2	5,156.1	224.9	582.8	101.3	6,065.0
Nov.*. ..	379.2	2,267.0	2,646.2	1,042.8	1,517.6	5,206.6	224.9	586.1	101.4	6,119.0

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 M3 and its components do not include 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.

3 Euro area-11 up to end-2000. Euro area-12 from 1 January 2001 onwards.

* Provisional data.

Source: ECB.

T a b l e 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)=(1.1)+(1.2)	Sight deposits and current accounts (1.1)	Savings deposits (1.2)	Deposits redeemable at notice of up to 3 months[3] (2)	Deposits with agreed maturity of up to 2 years (3)	Repurchase agreements (repos) (4)	Money market fund units (5)	Debt securities of up to 2 years (6)	Total[2] (M3 excluding currency in circulation) (7)=(1)+(2)+(3)+(4)+(5)+(6)
2000	61.2	13.3	47.9	2.0	28.9	18.5	15.4	0.2	126.2
2001	70.8	16.1	54.7	2.4	29.4	24.2	9.7	0.1	136.7
2002	71.7	15.2	56.5	2.3	28.9	20.0	10.7	0.2	133.8
2001 Jan.	59.5	12.5	47.0	2.0	28.1	21.0	14.7	0.2	125.5
Feb.	59.4	12.4	47.0	2.0	27.4	22.6	13.7	0.2	125.3
March ..	58.7	11.5	47.2	2.0	27.5	24.2	12.9	0.2	125.4
Apr.	60.3	12.4	47.9	2.0	27.3	25.2	12.4	0.2	127.4
May	59.7	11.8	47.9	2.2	27.1	26.1	11.8	0.2	127.1
June	61.4	12.4	49.0	2.2	26.5	27.3	11.2	0.2	128.8
July	61.8	12.5	49.3	2.2	26.1	28.6	11.2	0.2	130.1
Aug.	62.3	12.3	50.0	2.2	25.8	28.5	10.9	0.2	129.8
Sept. ...	62.6	12.2	50.4	2.2	24.0	29.3	10.5	0.2	128.8
Oct.	63.0	12.4	50.6	2.3	24.8	28.7	9.6	0.2	128.6
Nov.	64.6	13.2	51.4	2.3	26.3	26.8	9.4	0.1	129.5
Dec.	70.8	16.1	54.7	2.4	29.4	24.2	9.7	0.1	136.7
2002 Jan.	69.2	14.3	54.9	2.4	26.5	23.9	9.8	0.1	131.9
Feb.	68.9	13.8	55.1	2.4	27.3	23.0	9.4	0.1	131.1
March ..	67.4	12.5	54.9	2.4	27.2	24.2	9.3	0.1	130.7
Apr.	69.3	13.7	55.6	2.4	26.9	22.9	8.9	0.0	130.4
May	69.0	13.3	55.7	2.4	26.6	22.8	8.9	0.0	129.8
June	70.6	14.2	56.4	2.3	26.0	22.6	8.7	0.0	130.2
July	70.8	14.3	56.5	2.3	26.0	22.5	8.9	0.0	130.6
Aug.	71.3	14.1	57.2	2.3	26.3	22.8	8.9	0.1	131.7
Sept. ...	72.3	14.7	57.6	2.3	25.4	22.9	9.1	0.1	132.2
Oct.	70.0	13.5	56.5	2.3	26.6	23.2	9.0	0.1	131.2
Nov.	69.1	13.3	55.8	2.3	27.3	22.0	9.1	0.2	130.0
Dec.	71.7	15.2	56.5	2.3	28.9	20.0	10.7	0.2	133.8
2003 Jan.	70.3	14.2	56.1	2.2	28.9	20.2	12.0	0.2	133.7
Feb.	71.8	14.4	57.4	2.2	27.1	19.2	12.9	0.2	133.5
March ..	72.5	14.9	57.6	2.2	27.3	16.8	14.1	0.2	133.2
Apr.	72.7	14.6	58.1	2.2	28.7	16.3	14.4	0.3	134.7
May	71.9	14.5	57.4	2.0	28.8	15.7	14.7	0.3	133.4
June	74.9	16.7	58.2	2.1	29.7	13.5	15.7	0.4	136.3
July	72.9	15.8	57.1	2.1	32.0	13.0	15.8	0.4	136.3
Aug.	74.0	16.1	57.9	2.2	33.0	12.2	15.7	0.4	137.5
Sept. ...	74.9	17.1	57.8	2.1	32.7	12.0	15.6	0.4	137.7
Oct.	74.0	16.2	57.8	2.1	33.3	11.8	15.6	0.5	137.3
Nov.	74.1	15.4	58.7	2.1	32.9	11.6	15.5	0.5	136.7

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 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.

3 Foreign currency savings deposits and deposits redeemable at notice not associated with payment orders.

Source: Bank of Greece.

T a b l e III.3

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]
2000	90,737.8	73,720.2	17,017.6	11,007.0	50,917.8	28,813.0
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
2001 Jan.	88,672.8	71,364.1	17,308.7	10,004.0	50,097.1	28,571.6
Feb.	88,128.8	71,100.2	17,028.6	10,019.8	50,121.5	27,987.5
March	87,506.4	69,835.1	17,671.3	9,376.2	50,163.9	27,966.3
Apr.	89,005.3	72,383.4	16,621.9	10,149.5	50,991.1	27,864.7
May	88,126.9	71,588.8	16,538.1	9,522.3	51,161.0	27,443.6
June	89,219.5	73,009.8	16,209.7	10,132.4	52,280.3	26,806.8
July	89,196.9	73,484.2	15,712.7	10,146.2	52,527.7	26,523.0
Aug.	89,264.4	73,797.9	15,466.5	9,826.6	53,222.9	26,215.0
Sept.	88,095.4	72,815.9	15,279.6	9,849.7	53,730.0	24,515.9
Oct.	89,382.6	74,146.8	15,235.8	10,125.1	53,972.1	25,285.4
Nov.	92,567.2	73,956.4	18,610.7	10,928.3	54,790.3	26,848.6
Dec.	101,809.5	79,566.0	22,243.5	13,385.2	58,323.1	30,101.1
2002 Jan.	97,542.0	78,693.6	18,848.4	11,839.1	58,355.2	27,347.7
Feb.	98,302.4	79,029.9	19,272.4	11,356.7	58,674.4	28,271.3
March	96,741.8	77,970.2	18,771.6	10,267.5	58,309.6	28,164.7
Apr.	98,685.7	80,274.3	18,411.5	11,584.4	58,979.2	28,122.2
May	97,779.9	79,934.6	17,845.3	10,795.2	59,174.0	27,810.7
June	98,751.5	81,549.4	17,202.1	11,758.3	59,654.1	27,339.2
July	99,132.9	81,816.4	17,316.4	11,888.0	59,768.1	27,476.8
Aug.	99,924.1	82,255.7	17,668.4	11,656.2	60,475.4	27,792.5
Sept.	101,076.4	84,497.2	16,579.2	12,328.6	61,820.2	26,927.6
Oct.	100,492.7	83,175.9	17,316.8	11,399.8	60,572.9	28,519.9
Nov.	100,771.6	83,612.4	17,159.2	11,686.3	59,933.8	29,151.4
Dec.	104,761.1	87,732.3	17,028.8	13,367.3	60,406.1	30,987.7
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

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
2000		59,330.0	50,065.6	9,264.4	3,884.9	11,823.7	12,374.2	11,271.9	1,814.3	5,511.3	12,649.7
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
2001	Jan.....	59,938.1	51,062.9	8,875.2	3,809.7	11,617.1	12,370.5	11,542.8	1,851.0	5,601.0	13,146.0
	Feb. ...	60,758.1	52,131.0	8,627.1	3,723.9	11,813.8	12,374.8	11,775.0	1,894.5	5,715.7	13,460.4
	March..	62,687.0	54,138.2	8,548.8	3,869.2	11,972.1	12,731.5	12,067.4	1,946.9	5,973.5	14,126.4
	Apr. ...	63,300.2	54,967.1	8,333.1	3,957.4	11,802.2	12,716.1	12,327.2	1,998.4	6,109.2	14,389.7
	May ...	65,437.2	56,478.3	8,958.9	3,838.0	12,184.5	13,619.7	12,752.8	2,042.1	6,322.2	14,677.9
	June ...	67,191.8	58,451.6	8,740.2	3,802.5	12,493.1	14,110.5	13,053.2	2,066.5	6,577.4	15,088.6
	July....	67,876.5	59,419.2	8,457.3	3,807.4	12,712.7	14,014.7	13,531.7	2,055.5	6,727.6	15,026.9
	Aug. ...	68,345.9	60,214.8	8,131.1	3,767.4	12,630.0	14,031.4	13,859.7	2,040.1	6,887.2	15,130.1
	Sept....	69,886.2	61,843.1	8,043.1	3,821.8	12,843.6	14,456.8	14,250.8	1,990.0	7,117.5	15,405.7
	Oct. ...	70,591.5	62,887.0	7,704.5	3,735.5	12,718.4	14,510.7	14,695.7	1,992.2	7,379.6	15,559.4
	Nov. ...	72,434.1	64,675.3	7,758.8	3,666.9	12,733.1	14,755.9	15,187.6	2,007.1	7,535.4	16,548.1
	Dec. ...	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	Jan.....	73,982.0	66,648.1	7,333.9	3,230.0	12,435.1	15,174.6	16,024.7	2,236.0	7,783.7	17,097.9
	Feb. ...	75,202.2	67,723.9	7,478.3	3,030.3	12,724.5	15,846.7	16,417.5	2,267.5	7,944.7	16,971.0
	March..	76,235.3	69,080.0	7,155.3	3,139.4	13,168.1	15,788.0	16,891.9	2,316.4	8,129.8	16,801.7
	Apr. ...	76,958.0	69,886.9	7,071.1	3,196.1	12,801.1	15,939.4	17,362.1	2,341.0	8,301.2	17,017.1
	May ...	78,009.6	71,192.8	6,816.8	3,193.0	12,912.6	16,064.7	17,721.8	2,372.2	8,508.3	17,237.0
	June ...	79,960.9	73,475.3	6,485.6	3,167.7	13,360.0	16,516.2	18,194.3	2,414.5	8,678.1	17,630.1
	July....	81,233.9	74,622.8	6,611.1	3,167.7	13,720.8	16,570.9	18,759.9	2,411.6	8,868.0	17,735.0
	Aug. ...	82,041.4	75,311.8	6,729.6	3,191.4	13,625.4	16,580.6	19,304.9	2,399.3	8,997.7	17,942.1
	Sept....	82,662.6	75,930.7	6,731.9	3,212.8	13,785.6	16,059.8	19,503.8	2,560.0	9,228.1	18,312.5
	Oct. ...	83,996.1	77,164.1	6,832.0	3,221.6	13,961.2	16,161.2	19,914.7	2,635.0	9,420.9	18,681.5
	Nov. ...	85,614.8	78,732.9	6,881.9	3,167.1	14,528.2	15,663.2	20,416.6	2,761.1	9,612.9	19,465.7
	Dec. ...	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	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

1 Including large- and small-scale 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 basis points would be applied between the interest rate for the marginal lending facility and that for the deposit facility, aimed at facilitating the transition to the new regime by market participants.
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.

Table III.6

Greek government paper yields

(Percentages per annum, period averages)

| Period | Yield on one-year Treasury bills | Yield on drachma government bonds | | | | | |
		3-year	5-year	7-year	10-year	15-year	20-year
2000	6.22	5.99	5.98	6.05	6.10	6.26	6.35
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
2001 Jan.	4.57	4.66	4.91	5.03	5.35	5.61	5.81
Feb.	4.59	4.66	4.90	5.04	5.35	5.56	5.78
March	4.47	4.50	4.73	4.94	5.28	5.49	5.71
Apr.	4.48	4.53	4.79	4.89	5.39	5.55	5.77
May	4.52	4.59	4.89	5.01	5.54	5.70	5.92
June	4.31	4.40	4.73	4.88	5.48	5.66	5.91
July	4.31	4.39	4.75	4.89	5.52	5.71	5.94
Aug.	4.11	4.17	4.52	4.68	5.33	5.56	5.82
Sept.	3.77	3.78	4.27	4.47	5.31	5.55	5.88
Oct.	3.37	3.40	3.97	4.20	5.07	5.30	5.64
Nov.	3.20	4.12	4.14	5.07	4.90	5.10	5.36
Dec.	3.30	4.15	4.37	4.73	5.13	5.28	5.52
2002 Jan.	3.48	4.27	4.51	4.95	5.24	5.36	5.55
Feb.	3.59	4.37	4.73	5.07	5.31	5.41	5.60
March	3.81	4.58	5.00	5.27	5.51	5.58	5.78
Apr.	3.86	4.59	4.99	5.27	5.51	5.60	5.84
May	3.98	4.63	5.00	5.27	5.52	5.60	5.86
June	3.87	4.46	4.81	5.09	5.36	5.47	5.71
July	3.65	4.23	4.59	4.90	5.21	5.33	5.57
Aug.	3.44	3.90	4.29	4.60	4.95	5.07	5.34
Sept.	3.24	3.59	3.98	4.33	4.73	4.86	5.18
Oct.	3.13	3.52	3.95	4.34	4.79	4.94	5.32
Nov.	3.02	3.40	3.87	4.26	4.76	4.90	5.33
Dec.	2.87	3.19	3.63	4.05	4.58	4.71	5.13
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

Source: Bank of Greece.

T a b l e III.7

Bank deposit and lending rates in Greece

(Percentages per annum, period averages)

| Period | Deposit rates | | | Lending rates | | | |
| | | | | To enterprises | | To households | |
	Sight deposits	Savings deposits	12-month time deposits	Short-term	Long-term	Consumer[1]	Housing[2]
2000	2.73	5.71	6.14	12.33	11.52	17.00	9.76
2001	1.45	2.40	3.32	8.58	8.66	13.35	6.45
2002	0.82	1.51	2.76	7.41	7.43	12.64	5.70
2001 Jan.	1.66	2.93	3.84	9.40	9.12	14.37	7.31
Feb.	1.62	2.69	3.74	9.10	9.31	14.25	6.89
March	1.60	2.70	3.71	8.78	8.99	13.93	6.70
Apr.	1.69	2.71	3.62	8.88	9.08	13.80	6.60
May	1.54	2.57	3.64	8.87	8.98	13.53	6.55
June	1.52	2.47	3.57	8.65	8.69	13.25	6.49
July	1.42	2.46	3.55	8.64	8.61	12.97	6.50
Aug.	1.51	2.47	3.45	8.59	8.74	12.94	6.48
Sept.	1.31	2.30	3.05	8.35	8.38	13.07	6.38
Oct.	1.09	1.93	2.71	8.08	8.33	12.76	6.00
Nov.	1.28	1.90	2.51	7.87	8.00	12.68	5.77
Dec.	1.20	1.69	2.41	7.79	7.65	12.65	5.78
2002 Jan.	0.90	1.66	2.62	7.74	7.36	12.70	5.77
Feb.	0.79	1.68	2.63	7.66	7.81	12.89	5.77
March	0.83	1.66	2.74	7.63	7.60	12.82	5.76
Apr.	0.83	1.66	2.82	7.59	7.69	12.66	5.77
May	0.79	1.62	2.87	7.52	7.78	12.69	5.74
June	0.75	1.46	2.75	7.40	7.58	12.67	5.80
July	0.72	1.41	2.72	7.29	7.41	12.61	5.68
Aug.	0.90	1.41	2.70	7.17	7.49	12.54	5.64
Sept.	0.85	1.44	2.74	7.20	7.49	12.57	5.59
Oct.	0.91	1.48	2.84	7.29	7.20	12.49	5.66
Nov.	0.84	1.50	2.87	7.24	6.90	12.53	5.65
Dec.	0.75	1.09	2.80	7.23	6.82	12.53	5.53
2003 Jan.	0.74	1.09	2.83	7.10	6.68	12.48	5.46
Feb.	0.75	1.10	2.73	7.04	6.58	12.58	5.37
March	0.69	1.05	2.68	6.99	6.48	12.53	5.40
Apr.	0.73	1.04	2.70	7.00	6.58	12.61	5.44
May	0.70	1.03	2.61	6.88	6.49	12.52	5.43
June	0.55	0.81	2.44	6.76	6.36	12.30	5.42
July	0.60	0.79	2.38	6.61	6.21	12.20	5.39
Aug.	0.52	0.79	2.29	6.59	6.14	12.17	5.20
Sept.	0.55	0.80	2.30	6.57	6.12	12.25	5.20
Oct.	0.62	0.85	2.27	6.58	6.10	12.28	5.18
Nov.	0.54	0.85	2.29	6.63	6.13	12.31	5.18

1 Average rate on all categories of consumer loans.
2 Average rate on variable-rate housing loans with a maturity of over 5 years.
Source: Bank of Greece.

Table IV.1

Borrowing requirement of central government and public entities

(Million euro)

	Year		January-October		
	2001	2002	2001	2002	2003*
1 Central government[1,2]	**7,812**	**7,102**	**2,377**	**3,452**	**7,690**
– Government budget	7,909	6,674	3,498	4,073	9,032
(Ordinary badget)[2]	3,125	2,128	822	1,360	3,609
(Public investment budget)	4,784	4,546	2,676	2,713	5,423
– OPEKEPE[3]	–97	428	–1,121	–621	–1,342
Percentage of GDP	6,0	5,0	1,8	2,4	5,1
2 Public entities[4]	**–2,097**	**–1,560**	**–1,902**	**–1,990**	**–2,793**
– Financing of social security funds	–144	45	–295	72	134
– Financing of local authorities	103	123	–	15	–19
– Financing of other entities	138	395	–105	354	37
– Liquid assets	–2,194	–2,123	–1,502	–2,431	–2,945
Total (1+2)[5]	**5,715**	**5,542**	**475**	**1,462**	**4,897**

1 As shown by the movement of relevant accounts with the Bank of Greece, the Agricultural Bank of Greece and commercial banks.

2 Including the movement of public debt management accounts.

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

4 Including their liabilities towards the banking system, their bank deposits and their investment in Greek government paper effected through the Bank of Greece only; excluding other investment in securities which nevertheless affects their cash surplus.

5 Including the borrowing requirement of central government, as well as that of public entities as calculated on the basis of Bank of Greece intermediation only.

* Provisional data.

Source: Bank of Greece.

T a b l e IV.2
Financing of borrowing requirement of central government and public entities
(Million euro)

| | Year | | | | January-October | | | | | |
| | 2001 | | 2002 | | 2001 | | 2002 | | 2003* | |
	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total
Greek government paper held by monetary financial institutions[1]	1,325	23.2	−2,476	−44.7	2,679	564.0	−1,428	−97.7	−8,071	−164.8
Greek government paper held by private savers and enterprises[1]	−1,855	−32.5	1,038	18.7	−542	−114.1	1,738	118.9	1,559	31.8
Loans and advances from monetary financial institutions	−191	−3.3	987	17.8	−7,079	−1,490.3	−4,113	−281.3	−1,405	−28.7
Bank of Greece[2]	−895	−15.7	−392	−7.1	−2,019	−425.1	−683	−46.7	−2,294	−46.8
Borrowing from non-residents	7,331	128.3	6,385	115.2	7,436	1,565.5	5,948	406.8	15,108	308.5
Total	**5,715**	**100.0**	**5,542**	**100.0**	**475**	**100.0**	**1,462**	**100.0**	**4,897**	**100.0**

1 Including sales of securities in the secondary market.
2 This aggregate concerns changes in the balance of government's account with the Bank of Greece and not central bank financing.
* Provisional data.
Source: Bank of Greece.

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